Total value (in figure) _____ (In words) _____

2. Delivery schedule

(iii) Details of Performance Security

(iv) Quality Control

(a) Mode(s), stage(s) and place(s) of conducting inspections and tests.

(b) Designation and address of purchaser's inspecting officer

(v) Destination and despatch instructions

(vi) Consignee, including port consignee, if any

3. Warranty clause
4. Payment terms
5. Paying authority

_____

(Signature, name and address
of the Purchaser's/Consignee's authorised official)
For and on behalf of_____

Received and accepted this contract

(Signature, name and address of the supplier's executive
duly authorised to sign on behalf of the supplier)
For and on behalf of _____
(Name and address of the supplier)

(Seal of the supplier)
Date: _____

Place: _____

SECTION – XVI
CONTRACT FORM – B
CONTRACT FORM FOR ANNUAL COMPREHENSIVE MAINTENANCE CONTRACT

Annual CM Contract No._____ dated_____
Between

(Address of Head of Hospital/Institute/Medical College)
And

(Name & Address of the Supplier)

Ref: Contract No_____ dated_____ (Contract No. & date of Contract for supply, installation, commissioning, handing over, Trial run, Training of operators & warranty of goods)

In continuation to the above referred contract

6. The Contract of Annual Comprehensive Maintenance is hereby concluded as under: -

1	2	3	4					5
Schedule No.	**BRIEF DESCRIPTION OF GOODS**	**QUANTITY. (Nos.)**	**Annual Comprehensive Maintenance Contract Cost for Each Unit year wise*.**					**Total Annual Comprehensive Maintenance Contract Cost for 5 Years [3 x (4a+4b+4c+4d+4e)]**
			1st	**2nd**	**3rd**	**4th**	**5th**	
			a	**b**	**c**	**d**	**e**	

Total value (in figure) _____ (In words) _____

b) The CMC commence from the date of expiry of all obligations under Warranty i.e. from_____ (date of expiry of Warranty) and will expire on _____ (date of expiry of CMC)

c) The cost of Annual Comprehensive Maintenance Contract (CMC) which includes preventive maintenance, labour and spares, after satisfactory completion of Warranty period may be quoted for next 5 years as contained in the above referred contract on yearly basis for complete equipment (including X ray tubes, Helium for MRI, Batteries for UPS, other vacuumatic parts, _____ & _____) and Turnkey (if any).

d) There will be 98% uptime warranty during CMC period on 24 (hrs) X 7 (days) X 365 (days) basis, with penalty, to extend CMC period by double the downtime period.

e) During CMC period, the supplier shall visit at each consignee's site for preventive maintenance including testing and calibration as per the manufacturer's service/ technical/ operational manual. The supplier shall visit each consignee site as recommended in the manufacturer's manual, but at least once in 6 months commencing from the date of the successful completion of warranty period for preventive maintenance of the goods.

f) All software updates should be provided free of cost during CMC.

g) The bank guarantee valid till _____ [(fill the date) 2 months after expiry of entire CMC period] for an amount of Rs. _____ [(fill amount) equivalent to 2.5 % of the cost of the equipment as per contract] shall be furnished in the prescribed format given in Section XV of the TE document, along with the signed copy of Annual CMC within a period of 21 (twenty one) days of issue of Annual CMC failing which the proceeds of Performance Security shall be payable to the Purchaser/Consignee.

h) If there is any lapse in the performance of the CMC as per contract, the proceeds Annual CMC bank guarantee for an amount of Rs. _____ (equivalent to 2.5 % of the cost of the equipment as per contract) shall be payable to the Consignee.

i) **Payment terms:** The payment of Annual CMC will be made against the bills raised to the consignee by the supplier on six monthly basis after satisfactory completion of said period, duly certified by the HOD concerned. The payment will be made in Indian Rupees.

j) **Paying authority:** _____ (name of the consignee i.e. Hospital/ Institute /Medical College's authorised official)

_____

(Signature, name and address
of Hospital/Institute/Medical College's authorised official)
For and on behalf of_____

Received and accepted this contract

(Signature, name and address of the supplier's executive
duly authorised to sign on behalf of the supplier)
For and on behalf of _____
(Name and address of the supplier)

(Seal of the supplier)
Date: _____
Place: _____

SECTION – XVII
CONSIGNEE RECEIPT CERTIFICATE
(To be given by consignee's authorized representative)

The following store (s) has/have been received in good condition:

1) Contract No. & date :_____

2) Supplier's Name :_____

3) Consignee's Name & Address with telephone No. & Fax No. : _____

4) Name of the item supplied :_____

5) Quantity Supplied :_____

6) Date of Receipt by the Consignee :_____

7) Name and designation of Authorized Representative of Consignee :_____

8) Signature of Authorized Representative of Consignee with date :_____

9) Seal of the Consignee :_____

SECTION – XVIII

Proforma of Final Acceptance Certificate by the Consignee

No_____
Date_____

To

M/s _____
_____
_____

Subject: Certificate of commissioning of equipment/plant.

This is to certify that the equipment(s)/plant(s) as detailed below has/have been received in good conditions along with all the standard and special accessories and a set of spares (subject to remarks in Para no.02) in accordance with the contract/technical specifications. The same has been installed and commissioned.

(a) Contract No_____ dated_____

(b) Description of the equipment(s)/plants: _____

(c) Equipment(s)/ plant(s) nos.:_____

(d) Quantity: _____

(e) Bill of Loading/Air Way Bill/Railway Receipt/ Goods Consignment Note no_____ dated _____

(f) Name of the vessel/Transporters:_____
(g) Name of the Consignee:_____
(h) Date of commissioning and proving test:_____

Details of accessories/spares not yet supplied and recoveries to be made on that account.

Sl. No.	Description of Item	Quantity	Amount to be recovered No.

The proving test has been done to our entire satisfaction and operators have been trained to operate the equipment(s)/plant(s).
The supplier has fulfilled its contractual obligations satisfactorily ## or
The supplier has failed to fulfil its contractual obligations with regard to the following:
He has not adhered to the time schedule specified in the contract in dispatching the documents/drawings pursuant to 'Technical Specifications'.
He has not supervised the commissioning of the equipment(s)/plant(s)in time, i.e. within the

period specified in the contract from date of intimation by the Purchaser/Consignee in respect of the installation of the equipment(s)/plant(s).
The supplier as specified in the contract has not done training of personnel.

The extent of delay for each of the activities to be performed by the supplier in terms of the contract is
The amount of recovery on account of non-supply of accessories and spares is given under Para no.02.
The amount of recovery on account of failure of the supplier to meet his contractual obligations is_____ (here indicate the amount).
Signature
Name
Designation with stamp

Explanatory notes for filling up the certificate:

i.He has adhered to the time schedule specified in the contract in dispatching the documents/drawings pursuant to 'Technical Specification'.

ii.He has supervised the commissioning of the equipment(s)/plant(s) in time, i.e. within the time specified in the contract from date of intimation by the Purchaser/Consignee in respect of the installation of the equipment(s)/plant(s).

iii.Training of personnel has been done by the supplier as specified in the contract

iv.In the event of documents/drawings having not been supplied or installation and commissioning of the equipment(s)/plant(s) having been delayed on account of the supplier, the extent of delay should always be mentioned in clear terms.

SECTION – XIX
AFFIDAVIT/UNDERTAKING

I/ We have read and understood the instructions and the terms and conditions contained in the document. I/We accordingly accept all terms and conditions of the tender enquiry document including the essential conditions specially incorporated in the tender enquiry like terms of terms of payment, liquidated damages clause, warranty clause, dispute resolution mechanism applicable law. I/ We confirm that we do not stand deregistered/banned/blacklisted by any Govt. Authorities. I/ We do hereby declare that the information furnished/ uploaded is correct to the best of my/our knowledge and belief.I/ We hereby certify thatthe prices offered by us in this tender is not higher than the prices we had offered to any other Govt. of India Organisation(s)/PSU(s) during the last one year and shall provide the justification for reasonableness of our offered price whenever asked during evaluation of our submitted bid. I/ We also hereby certify that if at any time, information furnished by us is proved to be false or incorrect; I/ We are liable for any action as deemed fit by the purchaser in addition to forfeiture of the earnest money.

Date:

(Signature of the bidder)
NAME & ADDRESS OF THE BIDDER

NOTE: To be submitted on non-judicial stamp paper of Rs. 10/- duly certified by Public Notary

SECTION – XX
CHECKLIST
Name of Tenderer:
Name of Manufacturer:

Sl No.	Activity	Yes/ No/ NA	Page No. in the TE document	Remarks
1. a.	Have you enclosed EMD of required amount for the quoted schedules?			
b.	In case EMD is furnished in the form of Bank Guarantee, has it been furnished as per Section XIII?			
c.	In case Bank Guarantee is furnished, have you kept its validity of 165 days from Techno Commercial Tender Opening date as per clause 19 of GIT?			
2. a.	Have you enclosed duly filled Tender Form as per format in Section X?			
b.	Have you enclosed Power of Attorney in favour of the signatory?			
3.	Are you a SSI unit, if yes have you enclosed certificate of registration issued by Directorate of Industries/NSIC			
4. a.	Have you enclosed clause-by-clause technical compliance statement for the quoted goods vis-à-vis the Technical specifications?			
b.	In case of Technical deviations in the compliance statement, have you identified and marked the deviations?			

Sl No.	Activity	Yes/ No/ NA	Page No. in the TE document	Remarks
5. a.	Have you submitted satisfactory performance certificate/ Installation Reports as per the Proforma for performance statement in Sec. IX of TE document in respect of all orders?			
b.	Have you submitted copy of the order(s) and end user certificate/ Installation Reports?			
6.	Have you submitted manufacturer's authorization as per Section XIV?			
7.	Have you submitted prices of goods, turnkey (if any), CMC etc. in the Price Schedule as per Section XI?			
8.	Have you kept validity of 120 days from the Techno Commercial Tender Opening date as per the TE document?			
9. a.	In case of Indian Tenderer, have you furnished Income Tax Account No. as allotted by the Income Tax Department of Government of India?			
b.	In case of Foreign Tenderer, have you furnished Income Tax Account No. of your Indian Agent as allotted by the Income Tax Department of Government of India?			
10.	Have you intimated the name an full address of your Banker (s) along with your Account Number			
11.	Have you fully accepted payment terms as per TE document?			
12.	Have you fully accepted delivery period as per TE document?			

Sl No.	Activity	Yes/ No/ NA	Page No. in the TE document	Remarks
13.	Have you submitted the certificate of incorporation?			
14.	Have you accepted the warranty as per TE document?			
15.	Have you accepted terms and conditions of TE document?			
16.	Have you furnished documents establishing your eligibility & qualification criteria as per TE documents?			
17.	Have you furnished Annual Report (Balance Sheet and Profit & Loss Account) for last three years prior to the date of Tender opening duly certified by chartered accountant bearing their membership no.?			
18.	Have you enclosed the Affidavit as per Section XIX of the TE Document?			

N.B.

1. All pages of the Tender should be page numbered and indexed.
2. The Tenderer may go through the checklist and ensure that all the documents/confirmations listed above are enclosed in the tender and no column is left blank. If any column is not applicable, it may be filled up as NA.
2. It is the responsibility of tendered to go through the TE document to ensure furnishing all required documents in addition to above, if any.

(Signature with date)

(Full name, designation & address of the person duly authorised sign on behalf of the Tenderer)
For and on behalf of

(Name, address and stamp of the tendering firm)

Section – XXI
Consignee List

Consignee	Medical Institutions	Contact Address.
	Director, Kalapana Chawla Govt. Medical College, Model Town, Karnal.	Director, Kalapana Chawla Govt. Medical College, Model Town, Karnal.

NB: The Purchaser/consignee will ensure timely issue of CDEC, Octroi Exemption Certificates, Road Permits & Entry Tax Exemption Certificates, wherever applicable, to the suppliers.

TECHNICAL SPECIFICATIONS

1) Sigmoidoscope (Rigid)

Sigmoidoscope should be used in conjunction with either a 6 V illumination system with power handles.
Should be highly visible graduations to assist in positioning.
Should be Glare-free frosted coating ensures maximum light output at distal tip.
Should be individually wrapped for safety and convenience.
Should be Fiber-optic illumination system provides a cool 360 degree ring of light.
Should have hinged window with neoprene seal to avoid fogging during insufflations.

Should have the following in a durable, rust free case:

The Sigmoidoscope with Obturator
Complete Illumination System.
Light Handle with 0.9 m Cord.
Light Handle plus Transformer.
Fiber Optic Light Head.
Transformer with 1.5 m Cord.
3.5 V Halogen Handle Adapter.
3.5 V Direct Plug-in Rechargeable Handle.
Insufflation Bulb, complete.
Hydrophobic Filters (pack of 10) with Lue.

To be supplied with along with standard accessories.

2) Flexible Endoscope, Upper GI & Colonscope

Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected.

A) Video Gastro-scope – Should have the following:

Capable of producing Chrome Endoscopy images like NBI/SPIES/I-SCAN, with following features:

a. High Definition
b. Forward viewing
c. Observation range: minimum 5mm or less, maximum 100 mm or more
d. Field of view: 140 degrees or more
e. Distal end diameter: 11 mm or less
f. Bending capabilities: up-200 degrees or more
g. Down-120 degrees or more
h. Left- 120 degrees or more
i. Right-120 degrees or more
j. Forceps channel diameter; minimum 2.8mm
k. Working length: 1040 mm or more

B) Video Colonoscope – Should have the following:

Capable of producing Chrome Endoscopy images like NBI/SPIES/I-SCAN

a. High Definition
b. Forward viewing
c. Observation range: minimum 4mm or less, maximum 100 mm or more
d. Field of view: 140 degrees or more
e. Distal end diameter: 14 mm or less
f. Bending capabilities: up - 180 degrees or better

g. Down-180 degrees or better
h. Left-160 degrees or better
i. Right - 160 degrees or better
j. Forceps channel diameter: minimum 3.8 mm
k. Working length: 1650 mm or better

The following items should also be included in both the scopes:

- Carrying Case
- ETO Cap
- Leakage Tester
- Caps for Working Channel
- Irrigation Tube
- Bite protector (in Gastroscope only)
- Biopsy Forceps
- Cleaning Brush
- Cleaning Valve
- Snare
- Injection needle

Each of the above Scopes should be supplied along with each of the following:

HIGH DEFINITION VIDEO PROCESSOR

Special Features:

a. High definition digital output: DVI 1280 X 1024/ 1920 X 1080
b. Colour enhancement technology
c. Capable of connection to image capture device for recording HD still and video images

XENON LIGHT SOURCE

a. 300watts Xenon Light Source
b. Backup lamp halogen/Led/Xenon
c. Lamp life of xenon bulb should be 500 hrs
d. Lamp life of back up lamp, should be atleast 500hrs, with one or multiple bulbs
e. 300w Xenon light source can be combined unit/ integrated with HD video processor

Video Monitor: System should be supplied with a 19" or more size High Definition Medical Grade Monitor (LED / LCD) Max Resolution 1280 x 1024

Suction Machine

The Machine should offer quiet, low vibration operation, thus creating a pleasing environment for carrying out examinations and facilitating stress-free, concentrated work.
Should have
1- High suction capacity of 30 liters/minute
2- Maintenance free cylinder and piston system
3- Hydrophobic bacterial filter to protect the pump
4- Easy to clean.
5- Should be medical grade and European CE (EN type)/ USFDA approved.

Technical data:
Suction capacity: 30 liters/minute
Vacuum: up to 85kPa, up to 640mmHg
Line voltage: 230VAC, 50/60 Hz
Protection Class: Protection class I; BF;

Equipment Cart

Should be imported and have following specifications-

Equipment cart rides on 4 antistatic wheels, equipped with atleast 02 locking brakes, 3 fixed shelves, 1 with handles and lockable drawer, scope hanger to mount flexible scope.

All the offered products should be USFDA or European CE (EN type certified) approved, no discontinued products or recalled products (in past also) should be quoted.

3) Diagnostic Cystoscope

Technical Specification:-

***Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected*.**

TELESCOPES

- **Forward Viewing HD 4mm Telescope** 0 degree, enlarged view, autoclavable, fiber optic transmission incorporated – 1No.

- **Forward Viewing HD 4mm Telescope 3**0 degree, enlarged view, autoclavable, fiber optic transmission incorporated – 1No.

CYSTOSCOPE – URETHROSCOPE

- 19 Fr. Cysto Sheath with Standard Obturator
- 21 Fr. Cysto Sheath
- 23 Fr. Cysto Sheath
- 21 Fr. Cysto Standard Obturator
- 23 Fr. Cysto Standard Obturator
- 21 Fr. Cysto Visual Obturator
- 23 Fr. Cysto Visual Obturator
- Double Horn Bridge
- Rigid Optical biopsy forcep,30 degree
- Rigid Optical Stone Crushing Forcep (30 degree scope)
- Bladder syringe adapter, Cysto sheath
- Flexible Grasping Forcep, 5 Fr.
- Flexible Biopsy Cup, 5 Fr.
- Flexible Scissor, 5 FR.

LIGHT SOURCE

- Cold Light Fountain LED 225 W or above with one 225Watt LED lamp and one light outlet Power Supply: 220-240 VAC, 50/60 Hz – 1 No.
- Fiber Optic Light Cable, size 4.8 mm, length 250 cm, heat-resistant – 1 No.
- Universal jaw to accept any make fiber optic cable.

Appropriate plastic tray/cage for sterilization

- Sterilization Tray for disinfection.
- Plastic Container for Sterilization/Storage.

All the offered products other than plastic trays/cage for sterilization should be USFDA or European CE (EN type certified) approved

4) Uroflowmetry (Video Urodynamic)

Uroflowmetry is one way of integrating the activity of the bladder and the outlet during the emptying phase of micturation. The micturation process consists of detrusor function of bladder neck opening and urethral conductivity. It can establish the type of abnormality and filter the patients who require further invasive procedures. Thus, it avoids under treatment in the younger age group & restricts overzealous invasive procedure in the older age group.

Uroflowmeter should be fully automatic microprocessor based device with digitally controlled dip-stick type flow transducer. It should be designed to monitor the urinary volume and flow rate within a urine collection beaker during micturation. The system should be quite expedient for very practical day to day flow study.

When the micturation process starts, a volume change should be sensed by the microprocessor based device automatically, which determines and stores urinary volume, flow rate and time along with other parameters. At the end of micturation process the microprocessor based device should be programmed to determine parameters relating to urinary flow like voided volume, voiding time, flow time, maximum flow rate, average flow rate and time to maximum flow. It should also provide the graphical flow curve of the micturation process by the means of flow rate v/s time. At the end of micturation process, by automatic preset delay, it should give a printout which consists of a graphical flow curve as well as statistics relating to parameters of urinary flow altogether with the patients information.

5a) Operation Theatre Table for Minor OT - 3 Nos.

- Four section electro mechanical eccentrically pointed radio-translucent table top suitable for C-Arm
- Operating Position: Height adjustment, Lateral Tilt, Trendelenberg, Reverse Trendelenberg and Back Section are precisely.
- Head & Foot section are manually operated by the means of ratchet System
- Stainless steel made of 304 Grade covered base and cylinder covers for easy cleaning and hygiene
- Complete with stainless steel side –rail, clamps and standard accessories.

Specification:

Table top length	:	1900 mm
Table top width	:	500 mm
Height	:	750-1000 mm
Trendlenberg/Rev Trendlenberg	:	± 20 deg
Lateral tilt	:	± 15 deg
Back section	:	+ 70 deg ~- 20 deg
Leg section	:	-90 deg
Head section	:	+ 45 deg ~ -90 deg
Weight Capacity	:	200 Kg appox

It should have standard accessories like four/~~five~~ sections mattress (1 set) Anesthetist screen L (1Pc), Lateral support padded (2 Pair), shoulder support padded (2 Pair), Lithotomic crutches padded (2 Pair) and Arm rest padded.

The company should have ISO 9001: 2008 and unit should be CE Certified.

5b) Operation Theatre Table for Ophthalmology OT - 2 Nos.

Motorized with foot control

- Spring control levelling for tilting position.
- Electronic movement : up and down
- Dimensions: Length 188±2 cm, Width 69±2 cm
- Maximum Height : Approximately 90 cm or more
- Minimum Height: Approximately 60 cm or less
- Width: Approximately 50cm -60cm
- Width of table top: 50cm
- Trendelenburg: -30 degree to +30 degree

- Forward and reverse tilting should be available
- Foot and hand held control for changing positions
- Complete Ophthalmic Accessories which must include adjustable cushioned head rest, adjustable wrist support, side tray and provision for IV infusion pole
- Compatible power supply (220V; 50 Hz)
- Weight capacity minimum 100 kg.
- Accessories
  One Mattress Set with minimum thickness 50mm
  Body Strap (1 pair)
- CE approved.

6) Operation Theatre Table for Major OT

Should have following features:

1. Should be compatible with all makes of C-Arms allowing 100% radiological access of the patient,
2. It should be 5 section hydraulic operation table with split leg section.
3. The table should work on mains power supply. Additionally it is also capable of working on high storage capacity batteries with atleast 1hr. back up strength.
4. It should have standby back-up on failure of hand control or microprocessor, an override control panel, for adjustments of height up/down, Trendelenburg/reverse trendelenburg, lateral tilts.
5. The following adjustments must be electro-hydraulically operated via corded hand- control:
   a. Height down : 600-750mm
   b. Height up : 900-1050mm
   c. Trendelenburg : 30-35degree
   d. Reverse Trendelenburg : 25-30degree
   e. Lateral tilt (left) : 20-25°
   f. Lateral tilt (right) : 20-25°
   g. Zero position
   h. Battery status to be available on table body/hand remote through color LED.
6. Should have Split Leg sections +10° to -90° and swiveling. Head and leg section detachable.
7. Should be possible to position Head +45° to -45° and Back section up-down : +80° to -40°**.**
8. The table should be provided with special foam mattress of atleast 50 mm thickness.
9. Should be with a strong solid base with no obstruction to the feet.
10. It should be provided with four swivel castors with Hydraulic locking and breaking device.
11. The base, column cover is made up of ABS/stainless steel which is resistant to impact, breakage and resistance to corrosion.
12. The maximum permissible patient carrying weight to be min. 150 Kg or above.
13. Must have table top Kidney elevator / thoracic elevation system.
14. Table top atleast 50-55 cm wide and 190 -200 cm long.
15. The following of same make (CE marked) accessories are to be supplied alongwith each table
    a. Arm board with pad and clamp : 2nos
    b. Anesthesia screen with clamp : 1no.
    c. Lithotomy Padded Leg Holders (ball socket type)-1pair
    d. Side Lateral supports- with rectangular curved pads-1pair
    e. Shoulder support with rectangular pads--1pair
    f. X-ray cassette holder for tray
    g. IV Pole with bracket - 1 no.
    h. Patient restraint strap - 1 no.

Essential Optional accessories, The Bidder must quote the following essential accessories indicating individual price for each of the following essential optional accessories:

i. Uro-Pan with tube and filter - 1 no.
ii. Pressure management GEL pads for Head and heels
iii. Head and Body positioner for Prone and Supine position should be offered

17. Having US-FDA or European CE certification according directive EEC93/42
18. Meeting IECEN60601-2-46 safety regulations applicable to surgical tables apart from meeting general safety electrical regulation EN60601-1.
19. All technical specifications accepted in the compliance statement must be supported by printed literature from the firm.
20. Manufacturer should be ISO 9001 : 13485 and European CE certified for quality standards.

***The following essential items must be quoted*:**

1. All additional essential attachments for Orthopedics Operating Table - 2 complete sets for making it fully functional as Orthopedics Operation Table.
2. All additional essential attachments for Urology Operating Table - 1 complete set for making it fully functional as Urology Operation Table.
3. All additional essential attachments for ENT Operating Table - 1 complete set for making it fully functional as ENT Operation Table.
4. All additional essential attachments for Endoscopy Procedure Operating Table - 1 complete set for making it fully functional as Endoscopy Procedure Operation Table.
5. All additional essential attachments for General Surgery Operating Table - 3 complete set for making it fully functional as General Surgery Operating Table out of which one no. shall be used for Dental Surgery.

7) Operation Theatre Ceiling light (LED) for Minor OT

LED Double Dome O.T. Celling Light

The light should comprise of 2 domes, should have a facility of brightness adjustment, should provide shadow free and homogeneous light from both domes, both domes should be ready to mount Full HD camera in future.

Technical Specification:

- Should be white LED based microprocessor control technology and should provide the best shadow compensation with shadow free homogeneous field of light.
- Both dome should have diameter between 65-70cm
- Intensity at 1-meter distance not less than 1,20,000 lux or more for each dome.
- Variable Color Temperature for both domes: 5000 K or better
- Having on off switch and light intensity control
- Circular dome type for homogenous luminous field with shadow free lighting.
- The contrast between the lighted area and the surrounding should not cause stress to the surgeon's eye.
- Depth of illumination for both domes should be at least 150cm.
- Illuminated field diameter should be at least 20-28 cms or better in each dome
- Increase in temperature near head should be specified and should not be more than 2 degree C.
- Color rendering index (CRI) should be 95 or better.
- Height adjustment more than 1 meter.
- LED life span of each dome should be 30000 or more Hrs.
- Light field adjustment by sterilisable handle as well as with touch screen control pad mounted on light suspension.
- Touch screen control panels on the light suspension for adjustment of light intensity, color select, room ambiance light of combination of green and white, illuminated area and for switching on and off, focusing etc
- The circular light head should be so constructed as to provide optimum conditions for laminar flow.
- It should have provision for room ambiance light and the same should be integrated in the suspension.
- Should be USFDA/ European CE approved.

8) Pedestal lights

Specification

a. Extremely flat, compact and aero dynamical
b. The single light head should consist of several, symmetrically arranged LED.
c. Should provide shadow free and cool light
d. Light head diameter should be compact and should be below 35cm
e. Light Head: Light - Head made of power - coated aluminum die case
f. Light Head having smooth and clean surfaces that are easy and safely to clean
g. It should have color temperature 4500K.
h. One point suspended on articulating arm, diameter below 150mm
i. Lighting intensity at 1m distance: min. 50,000 lux or more.
j. Life span of main light source: 30000 hrs or more
k. Supply voltage: 220 VAC / 24V DC / 24 V AC
l. The unit should be having USFDA or European CE (EN type) approved
m. All technical specifications accepted in the compliance statement must be supported by original literature from the firm.

9) Electro-surgical unit

Specification:-

- Should have adequate power output of 250 - 300 watts for Monopolar cutting
- Should have power output of minimum 120 watts or more for Monopolar Coagulation
- Should have power output of minimum 120 watts or more for Bipolar Coagulation
- Power and other features should be controlled through one touch key and LCD display for specialty, program and individual user name/setting.
- Should have 10 cutting modes
- Should have 5 coagulation modes, which are spray & 3 forced coagulation, Soft Coagulation) and 3 types of forced coagulation should have Mixed cutting, Non-cutting & cutting mode.
- Should have facility to be used with argon plasma unit.
- Should have facility by which user can save their mode/ setting for 75 plus different names/ individual settings.
- Should have auto start function for bipolar output.
- Unit should have International Safety Standard and should be USFDA or EN European standards certified product.

- **Should be supplied with following accessories:**
  Double pedal footswitch – 01 No.
  Hand controlled monopolar handle with electrode and cable (Reusable) – 01 No.
  Patient plate with cable (reusable) – 02 Nos.
  Bipolar forceps with cable (reusable) – 02 Nos.

The complete unit should be of same make and manufacturer should have EN ISO certification to international standards.

10) Suction

- Suction Machine with Noiseless and Vibration free.
- It should give high suction 30 lt/min.
- Vacuum should be.atleast 675 mm Hg
- It should have hydrophobic bacterial filter to protect pump with emergency jar, with overflow protection device.
- Unit should be consisting of:-
  Bottle cap with grip, connecting tube, patient tube, secretion bottle 3 ltr, bacterial filter and mains cord.
- Unit should run on power supply 115/230 VAC.
- It should have European CE & USA FDA Certificate.
- Unit should be mounted on mobile trolley with on/off switch
- Unit should have carbon fiber piston cylinder based technology
- Weight should not be more than 7 kg.
- Unit should be certified to IEC 601-1 European CE label acces to MDD.

11) Pulse Oximeter

a. **Description of Function:**
The Pulse Oximeter is a device that indirectly measures the amount of Oxygen in a Patient's body (as opposed to measuring Oxygen Saturation directly through Blood Sample) and changes in Blood Volume in the skin, producing a Photo-Plethysmograph.

b. **Operation Requirements:**
The System should be suitable for all types of Patient Range: Adult, Pediatric, Infant / Neonates.

c. **Technical Specifications:**
The Display should be LCD with Backlight.
Parameters and waveform should display SpO_2, Pulse Rate, System Status, Plethesmograph, Menus for user settings:
SpO_2 Range: 70-100%.
Accuracy of SpO_2: 3%
Pulse Rate Range should be 30 – 240 bpm.
Audiovisual Alarm: High / Low SpO_2 and Pulse Rate, Sensor OFF, Sensor Failure, Low Battery.
Alarm overrides Facility.
Cable length should be minimum 1 meter.
RS 232C Interface for Data Communications.
Integrated Printer.
Battery Back-up operating time 5 Hours.

d. **System Configuration, Accessories, Spares & Consumables:**
System As specified below:-
SpO_2: Adult SpO_2 sensor with cable – two in nos. per monitor and pediatric SpO_2 sensors – One No. per Monitor, Neonatal Sensor – 01 per Monitor.

e. **Environmental Factor:**
Shall meet IEC-60601-1-2:2001 (or Equivalent BIS). General Requirements of Safety for Electromagnetic Compatibility or should comply with 89/366/EEC; EMC-Directive.
The Unit shall be capable of being stored continuously in ambient temperature of 0-50^{O}C and Relative Humidity of 15 – 90 %.

f. **Power Supply:**
Should work on 220 – 240 V AC as well as rechargeable batteries. Mains adaptor to be supplied.
Rechargeable battery operated system. Charger to be provided if integrated charger is not available.

g. **Standard, Safety & Training:**
Should be FDA, CE, UL or BIS approved product.
Manufacturer / supplier should have ISO certification for quality standards.

h. **Documentation:**
User / Technical / Maintenance Manuals to be supplied in English.
Certificate of Calibration and inspection.

List of important & frequently used spare parts and accessories with their part number and costing to be provided separately.

12) Anesthesia Equipment (Work Station)

The Machine should have the following:

1. Should have pipelines attachment for oxygen, nitrous oxide and compressed air.
2. Should have yoke assembly for oxygen and nitrous oxide with pin index system.
3. Durable main switch to put the machine in the on or off position.
4. Should have cascade double tube bobbin type flow meters for oxygen and nitrous oxide and single for air.
5. Should have safety features like :
   a. Minimum oxygen flow of 50ml/min or more even when the machine is in on position.
   b. Should provide 25% or more of oxygen when an anaesthetic gaseous mixture is in used.
   c. Should be provided with mechanical/ **Pneumatic** hypoxic guard.
   d. Should have extra flow meters for oxygen only.
6. Should have oxygen flush with a flow rate of more than 35L/min.
7. Should be able to hold **two** seletatec vaporizers (Isoflurane, Sevoflurane & Desflurane) simultaneously. Vapourizers should be maintenance free. Cost of vaporizers to be quoted separately. The anesthesia machine should provide desflurane compensation.
8. CO_2 absorber system with the following features :-
   a. Single/Double canister
   b. Autoclavable
   c. Canister capacity of 1.2kg or more.
   d. It should be possible to bypass the canister if removed during clinical cases to change sodalime.
9. APL valve assembly and Bag mount should be conveniently placed.
10. Independent port for open circuit.
11. Should be provided with two or more drawers.
12. Machine should have a good quality handle and castors to move the machine with locking system.
13. The ventilator of the machine should have the following features:-
    a. Should be electronically controlled.
    b. Should be suitable for both pediatric, adult and new born.
    c. It should have coloured screen **with 10" display or better.**
    d. Volume and pressure control mode of ventilations.
    e. Electronic peep
    f. Both SIMV **with** pressure support mode.
    g. Tidal volume range from 20ml to 1200 ml or more.
    h. Respiratory rate from 4 to **60**or more
    i. I:E ratio: **1: 4 to 4:1**
    j. Display: Respiratory rate, peak airway pressure and PEEP
    k. There should be no collection of water in the breathing system.
14. Should have independent oxygen sensor for FiO2 monitor and flow sensor for spirometry.
15. The system should not require to change bellows for different category of Patients.
16. Should be able to display atleast **one** waveforms at a time either of the following:
    a. Pressure Vs time
    b. Volume Vs time
    c. Pressure Vs volume
16. Should have a battery backup of atleast **60** minutes.
17. Demonstration of the product is must for all the firm.

The Monitor should have the following:

1. A configurable patient monitor
2. Should have atleast **15"**TFT colour display with up to **10** waveforms at a time.
3. Should be touch screen
4. Should be able to measure the following parameters:
   a. 3/5 lead ECG with electro-cautery & defibrillator filter with ST Segment & arrhythmia detection with

analysis,
   b. Respiration , SpO_2, temperature
   c. NIBP, 2 IBP , $EtCO_2$
   d. Multi –Gas analysis display of MAC Value
   e. Upgradable to cardiac output (thermo-dilution) monitoring.
5. Should be able to calculate and display FiO2.
6. Separate indicator lights for technical and physiological alarms.
7. Maximum BEEP tone should be loud enough to be audible from atleast a distance of 12 feet.
8. Should have graded audio and visual alarms for the following parameters:
   a) Blood pressure: High and Low
   b) SpO_2: High and Low
   c) Heart rate: High and Low
   d) Respiration: High and Low
   e) FiO_2: High and Low
11. Trends – Upto 24 Hours or more, trend analysis, upto 24 hours full disclosure.
12. Battery Back- up – Li-ion Battery of 1 hour or more.
    1. The machine should be internationally reputed company and should be USFDA **/ European CE** approved.
    2. Bidder must ensure regular supply of Sodalime

The machine should be supplied with the following accessories:

   a. ECG Cable – 2 nos
   b. Reusable SpO_2 Sensors: 2 each for Adult, Pediatric & Neonatal.
   c. NIBP Cuff: 2 each for Adult, Pediatric & Neonatal.
   d. IBP Transducers: Disposable 10 nos.
   e. IBP Cable: 2 nos
   f. ETCO2 Sample Line: 10 nos
   g. Reusable autoclavable Breathing circuit: 2 nos each for Adult & pediatric

All the components like machine, monitor and vaporizers should be from the same original manufacturer.

13) Resuscitation kit

***Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected*.**

Each Kit should have the Specification:

1. Should be provided with Intubation Fiberoscope with following components:
   a. Intubation Fiberoscope
   b. To have a Steerable Tip with deflection 130- 140°. up & down.
   c. Working Length should be 60-65cms with dia 3.5 – 4mm.
   d. Bite Block and ET Tube Holder should be provided.
   e. Scope should take at least 4.5mm of ET tube
   f. Outside shaft should have 5cm interval markings
   g. It should have separate suction and drug port
   h. Sufficient disposable suctions caps should be provided
   i. Should connect the endo-camera for screen visualization.
2. To have Retromolar Intubation fiberscope for unexpected difficult airways.
   a. Tip Distal Bending 40°.
   b. To be movable eyepiece
   c. To have a light source connection
   d. With length 40-42cms and dia 5-6 cms.
   e. ET tube holder should be provided
   f. Should take min. 5.5 size of ET tube
3. Portable LED light source should be provided
   a. with illumination not less than 50000 Lux
   b. should run on two 3v photo batteries
   c. burning life should be more than 100 minutes
   d. ergonomically designed and can be connected to both the fibrescopes

   e. life of LED should be close to 50000 hrs
4. One Laryngoscope with rechargeable battery pack and blade with fibreoptic mechanism should be provided to be used on both adult and pediatric patients with charger.
5. Other accessories like spiral tube size 6mm, magill forceps and all necessary adaptors for using fibrescopes should be provided along
6. Should have Emergency Cricothyroidotomy for pediatric and adult
   a. disposable blades
   b. dialator
7. Should have Combitube size 37Fr. with complete kit
8. Should have Intubating Laryngeal Mask Airways with Following Components:
   a. ILMA Sizes 3 & 4.
   b. ILMA Tubes ID 7mm & 7.5mm.
   c. Tube Stabilizing rod
   d. Cuff deflator
9. Should have Laryngeal Mask Airways of sizes 1,2 and 4
10. Handy and strong brief case/bag should be provided to keep all the instruments safe.
11. Set of disposable percutaneous tracheotomy kit for adult and pediatric.
12. Should have standard AMBU bag for pediatric and adult with bain circuit.
13. Mechanical suction pump with suction catheter and stomach tubes.
14. Should have Aluminum Oxygen reservoir 2 Liter with oxygen tube and cather.
15. Oxygen pressure reducer, regulable 0-15 liter with coupler for respirator.
16. Ventilating bag
17. Lubricant
18. Blood pressure meter, boso K-II
19. Stethoscope
20. Rescue blanket gold/silver
21. Infusion system.

14) Assorted Surgical Instruments for Minor Operation Sets

Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected.

- SCALPEL HANDLE#3 125MM(1)
- SCALPEL HANDLE#4 125MM(1)
- SCALPEL HANDLE#7 160MM(1)
- TC THUMB DRESS FORCEPS 14,5 CM(2)
- TC TISSUE FORCEPS 14,5 CM 1X2 T(2)
- TC ADSON TISSUE FORCEPS 1X2 12 CM(1)
- TC ADSON DRESS FORCEPS 12 CM(1)
- TC METZENBAUM SCISSORS FINE CVD 14,5CM(1)
- TC METZENBAUM SCISSORS FINE STR. 14,5CM(1)
- SC KNAPP IRIS SCISSORS BL/BL STR10.5(1)
- KNAPP IRIS SCISSORS BL/BL CVD10.5(1)
- SURGICAL SCISSORS STR SH/BL 14,5 CM(1)
- HALSTED-MOSQUITO FORCEPS STR 12CM(12)
- HALSTED-MOSQUITO FORCEPS CVD 12CM(12)
- CRILE ART FORCEPS CVD 14 CM(6)
- CRILE ART FORCEPS STR 14 CM(6)
- ALLIS TISSUE FORCEPS 4X5 15,5 CM(6)
- ALLIS TISSUE FORCEPS 4X5 20 CM(6)
- BABY-MEEKER DISSECTING FORCEPS 13(1)
- BABY-MEEKER DISSECTING FORCEPS 16(1)
- MIXTER ARTERY FORCEPS 20CM(1)

- FOERSTER SP FORCEPS STR 20 SERR(4)
- BACKHAUS TOWEL FORCEPS 10 CM(12)
- GROOVED DIRECTOR 14,5 CM(1)
- PROBE WITH EYE 14,5MM, SS(1)
- FINE RAKE RETRACTOR 2BL PR 16,5CM(2)
- VOLKMAN RETRACTOR 4 SH PR 21,5(2)
- FRAZIER SUCTION TUBE 3.3MM 19CM(1)
- CUSHING VEIN RETRACTOR 11X14MM 20CM(1)
- SENN MILLER RETRACTOR SHARP 16 CM(2)
- US ARMY RETRACTOR 21 CM SET OF 2(1)
- POOLE PEDIATRIC SUCTION TUBE(1)
- TC CRILE WOOD NEEDLE HOLDER 15 CM(2)
- CHEATLE FORCEPS WITH JAR 26CM(1)
- PERFORATED STERILIZATION BOX (1)

- All SURGICAL instruments should be CE Or USFDA certified. certificate should be necessarily provided with the tender
- All instruments should be manufacture by ISO 9001:2008,ISO 13485:2003 certified company.
- SURGICAL Instrument made by steel grade AISI 410 and 420, Test report from should be submitted with tender document/at the time of sample.
- Lager marking along with code should be on the instruments
- Bidder should submit original literature/broacher of Quoted Model, Technical compliance detail & should clearly demonstrate having any deviation between technical specifications & broacher/literature of the quoted model.
- Quantity of each instrument is indicated within bracket.

15) Autoclave (Flash)

a) Sterilizer Type: Table Top Sterilizer.
b) Capacity: **minimum 18 liters.**
c) Chamber Size: The sterilizer should have Rectangular/Cylindrical chamber with suiting the volume for sterilization.
d) Maximum processing capacity per charge.
e) Quality System Compliance: Sterilizer should comply with the quality systems as per ISO 9001:2000, EN ISO.
f) **Types of Cycles Process:** Table Top Sterilizers should be equipped with B-process as per latest guidelines.
g) Should be made of S.S.316 & should comply the Pressure Equipment Directive (PED) & EN 13445 norms or equivalent.
h) Chamber should have minimum 5 years warranty or should confirm 44~ 50,000 process minimum life.
i) Chamber should have working pressure 2.2 bar & design pressure upto 3.8 bar.
j) Chamber should have Stress & Fatigue analysis reports for material & Construction of the pressure vessel.
k) Chamber should be equipped with electrically heated jacket for preheating on standby mode.
l) Should have horizontal sliding/Hinged door with silicon elastomer rubber gasket to withstand temperature upto 140°C.
m) A disposable air filter should be provided for filtering the atmospheric air before entering inside the chamber. The filter separation efficiency should be higher than 99.998% for particle size less than 0.3**µ**m.
n) 134°C Wrapped & Unwrapped.
o) 12 1°C Wrapped & Unwrapped.
p) 134°C Flash/Rapid open instrument cycle.
q) 134°C Textile.
r) 134°C Prion.
s) Test programs: Bowie & Dick, Leak Test, Helix Test.
t) Sterilizer should have inbuilt water reservoir with storage capacity of 3 – 5 Litres. The water reservoir should have easy access for cleaning & to avoid bio film.

u) Sterilizer should have inbuilt steam generator with warranty of 5 years on heating elements. The steam generator design should be with integrated energy storing system for building up power for sterilization loads in short time.
v) The control system should be microprocessor based PLC system specially designed for sterilization applications. The control system should have CPU processor with battery back~ up, Digital input/output controls, analog measuring inputs & COM ports for printer & PC connectivity.
w) **Alarms:** Automatic process checking & failure correction should be possible by the control system. The range of alarm should include Temperature & pressure sensor failure, phase time~ out, doors not properly closed, power failure (less than 10 sec should be ignored), continuous self checking of all the safety devices, low water level etc. All the alarms should be audio~ visual.
x) **Accessories:** The sterilizer unit should included Rack with 3 levels & suitable size instrument trays should be the part of the supply for every sterilizer. The Sterilizer should have water circulation system so that no drain point & fixed water inlets required.
y) **Standards & Norms:** The sterilizer must comply the following standards, ISO 9001:2000 (Quality Systems), ISO 13485:2003 (Quality Systems for Medical Devices), ISO 14001 (Environment Management System).
z) The product should be US FDA or European CE Certified.

16a) Monitors for pulse rate, Heart Rate - 12 Nos

1. Should be suitable for adult, pediatrics neonatal patients monitoring.
2. The monitor should have ECG, Respiration, NIBP, SpO_2, Dual Temperature, Dual IBP, $EtCO_2$ as standard. The monitor should be upgradeable to Cardiac Output.
3. Should have ST analysis, Arrhythmia detection, pacer spike detection, Drug Dose Calculation and Oxy-CRG as standard in every monitor
4. Should have integrated 15" or above TFT-LCD colour touch screen display (resolution min 1024x768) with minimum 10channels of waveforms.
5. Defib and ESU protection should be present
6. Should have monitoring, surgery and diagnostic mode of monitoring
7. Should have Advance Arrhythmia monitoring for Asystole, Vfib/Vtac, VT>2, Couplet, Bigeminy, Trigeminy, R on T, PVC, Tachy, Brady, Missed Beats, IRR, PNC, Vbrady.
8. Monitor access should be with Touch screen, rotary knob and fast access key for quick function.
9. 120 hrs of trend and 60 events with waveform as standard in all monitors
10. Color or position of waveforms or parameters should be able to be adjusted based on users preferences. Big font on screen format should be present.
11. Nurse call, VGA output port should be standard in every monitor.
12. Monitor should have USB port for software upgrade& should have web browsing facility.
13. Should have inbuilt three channel recorder as standard in every monitor
14. Should have 2hrs (typically) of battery backup as standard in every monitor
15. Should be European CE/ US FDA for both Monitor and software to control physiologic monitoring systems.
16. Should have facility to connect to Central Station. Should be upgradeable to facility of Web browsing and demonstration is must.
17. Should have Mainstream / Microstream Capnography ($EtCO_2$) as standard
18. Upgradeable to AGM with automatic Agent identification with MAC value.

Should have following parameters:

ECG
- Monitor should have capability for display upto 7 Lead.
- ST Analysis
- Waveform Freeze option with review of 120 sec
- Range: 15 to 350 bpm

RESPIRATION
- Through impedance pneumography method or EtCO2

SpO_2
- Should provide value for arterial oxygen saturation as well as plethysmographic pulse waveform

NIBP
- By oscillometric principle of measurement.
- Should display Systolic, diastolic, mean pressure in large easy to read display
- Range: 10 to 270 mmHg

Dual Temperature –Core & skin. Range: 0 to 50 Deg C

Dual IBP – Should include Starter kit and simultaneous monitoring of dual temp and dual IBP should be possible. Range: -50 to 300 mmHg

Scope of supply must include:

- Basic unit with ECG, Resp, SpO_2, Dual Temp, NIBP, Dual IBP, inbuilt battery, Inbuilt three channel recorder –1 no
- 5 lead ECG Cable – 1 no each per monitor
- ECG disposable electrodes – 30 nos per monitor
- SpO_2 finger sensor– 1 no per monitor
- Skin temperature probe – 1 no per monitor
- NIBP Hose - 1no per monitor
- Adult& Paediatric cuff – 1noeach per monitor
- $EtCO_2$ Accessories
- Should be supplied with intermediate IBP cable– 2no per monitor
- Disposable transducers – 10nos
- Paper rolls- 4no per monitor
- Wall mount
- Instruction for Use per monitor

16b) Central Nurses Monitors for the above Monitor - 2 Nos

One Central Nurses Monitor for 6 Bed side Monitor

17) Incubators / Transport incubators

Specification of Baby Incubator

- It should have double lock system with collapsible trolley .
- It should have Air curtain of access port.
- It should have mattress(mattress tilting range- 13^0) platform tilting function.
- It should have Electro Static Filter.
- It should have excellent visibility.
- **It should have active / passive humidification**
- It should have sanitary structure for though cleaning of the unit.
- It should have rotary damper control for quieter operation of the admittance panel.
- It should have O_2 controller.
- It should have power requirements up to 800 VA (max.).
- It should have Air velocity 10 cm/s or below.
- It should have accessories pneumoclean, dustcover, piping connecting hose 3m, oxygen sensor and skin temp probe, 5 mm O.D.
- It should have snap open access ports to opened and close the doors silently.
- **Should be US FDA approved**

Specifications:-

Power requirements	Main body: customer specified Power consumption : 600VA (Maximum)
Classification	Class I, type BF
Temperature Control	• Skin temperature setting range: 34.0 ~37.5 ^{0}C / 93.2 ~99.5 ^{0}F (servo control) 37.6 ~38.0 ^{0}C / 99.7 ~100.4 ^{0}F (over ride). • Skin temperature display range: 30.0 ~42.0 ^{0}C / 86 ~107.6 ^{0}F. • Incubator air temperature setting range: 23.0 ~37.0 ^{0}C / 73.4 ~98.6 ^{0}F (manual control) 37.1 ~39.0 ^{0}C / 98.8 ~102.2 ^{0}F (over ride). • Incubator air temperature setting range: 20.0 ~42.0 ^{0}C / 68 ~107.6 ^{0}F Heater Output: 0 ~100% (in 10 levels). • Alarms: high temperature, set temperature, skin temperature probe
Noise level	Approx. 41 dB (without humidification) approx. 44dB (with humidification)
Mattress tilting range	13^0

18) Neonatal Bassinet

1. Should be a microprocessor controlled system with future expandability/ upgrade for additional functions and small footprint
2. Should have warmer integrated on trolley and control panel for settings and messages
3. Should have an integrated radiant warmer with Smart Swivel to keep heat always focused on the baby , even when radiant heater is moved to side for procedures. Warmer specifications should be as below:
    a. Radiant power at a distance of 80 cm should not be more than 10 – 30 mw/cm^2
    b. 2 infrared ceramic radiating elements
    c. Should have an integrated procedure light (20 – 25 W) and a night lamp (7 – 10 W)
    d. Minimum Clearance between top edge of warmer and ceiling should be $\geq$ 50 cm
4. Tilting should be smooth and should be from +20 Degrees to – 15 Degrees
5. Height adjustment should be through two footswitches with smooth jerk free movement
6. Control Panel should have built in self test when switched on. It should have :
    a. Manual Temperature control to set temperature regardless of core temperature
    b. Servo / Baby mode – warmer output automatically adjusted according to temperature difference between skin temperature and desired value
    c. Alarms for deviations in temperature of $\pm$ 0.5^0 Cent.
    d. Central Large alarm with audio for deviations in temperature
    e. Measurement of central and peripheral temperature
    f. Continuous measurement with Large easy to read display
7. Integrated Phototherapy unit (optional) in same unit as warmer
    a. with halogen lamp for phototherapy
8. Physical dimensions should not be more than 150 cm (L) x 100 cm (W) x 200 cm (D)
9. Warmer should confirm to relevant EN standard for Electrical Safety and should have Euro CE and US FDA approvals
10. Standard scope of supply must include :
    a. Warming Unit
    b. Skin servo mode
    c. Alarm facility with thermo monitoring
    d. In Built scale (optional) which should be easily integrated
    e. Bed tilt facility
    f. Heated gel mattress / X Ray Tray
    g. Integrated RS232C output
    h. Temperature probes – reusable or disposable.

19) Arterial blood analyzer

a. Fully automatic, upgradeable, fast electrolyte combination analyzer.
b. Essential Measured parameters; pH, pCO_2, pO_2, SaO_2, tHb, Barometric Pressure, Na+, K+, Ca++, Cl-, Bl

urea and Sr Creatanine & Blood sugar. All these parameters should be measured simultaneously.
c. Calculated parameters should include BE, BE ecf, HCO_3, Lactate, Anion Gap etc.
d. Sample volume-less than 120µl.
e. Fast analysis time – less than 72 sec.
f. Maintenance free electrodes with individual electrodes ON/OFF facility.
g. Fully automatic liquid calibration of all parameters at user-defined intervals without the use of Gas calibrated reagents, external gases, tanks or regulators.
h. Continuous reagent level monitoring with graphic display.
i. Data display on well-illuminated, adequate size LCD colour touch screen display.
j. Data print out on built in graphic printer.
k. Built in auto Quality control facility.
l. Reagents for one year @20 samples/day should be provided along with the machine.
m. Cost of reagents to be quoted for comparative evaluation.
n. Stand by blood gas cum electrolyte analyzer in case of breakdown.
o. List of accessories along with costing should be mentioned.
p. Should be FDA or CE or BIS approved product.

20) Oesophageal/Gastric pH & pressure recorder

The esophageal manometry catheter should be long, flexible tube that is to be placed in the patient's esophagus with the distal tip lying in the stomach. The catheters should be made of a variety of plastic materials, polyvinyl chloride or silicone. The tip should be slightly curved and should include a weighted distal metal tip to facilitate passage into the stomach. The compliance of the catheters changes with alterations in temperature, which assists placement. Catheters should be available in a variety of configurations, with diameters ranging from 2.7 to 4.7 mm and the number of sensors ranging from 4 to 36. The manometry catheters may be water perfusion and solid state type.

The system should be catheter-based method of assessing bolus movement within the esophagus. It should be combined with pH testing or with manometry, when needed. When combined with manometry, it should provide simultaneous data on bolus transit and contractions to identify whether a functional defect is present. When combined with pH testing, impedance should identify reflux whether the refluxate is acidic and can provide correlation between reflux episodes and symptoms to help guide management

21) General Surgical Sets for Major OT

Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected.

- SCALPEL HANDLE#3 125MM(1)
- SCALPEL HANDLE #3L 21CM(1)
- SCALPEL HANDLE#4 130MM(1)
- TC THUMB DRESS FORCEPS14,5 CM (2)
- TC TISSUE FORCEPS 14,5 CM 1X2 T(2)
- TC THUMB DRESS FORCEPS 20 CM(1)
- TC TISSUE FORCEPS 20,5 CM 1X2 T(2)
- TC ADSON TISSUE FORCEPS1X2 12 CM(1)
- SC MAYO DISSECTING SCISSORS STR SERRATED 17 CM(1)
- SC MAYO DISSECTING SCISSORS CVD SERRATED 17 CM(2)
- SC METZENBAUM SCISSORS FINE CVD SERRATED 18CM(2)
- SURGICAL SCISSORS STR SH/BL 14,5 CM(2)
- HALSTED-MOSQUITO FORCEPSSTR 12CM(12)
- HALSTED-MOSQUITO FORCEPS CVD 12CM(12)
- CRILE ART FORCEPS CVD 14 CM(12)
- CRILE ART FORCEPS STR 14 CM(12)
- PEAN ARTERY FORCEPS 20CM STRAIGHT(12)
- PEAN ARTERY FORCEPS 20CM CURVED (12)

- COLLER CRILE ART FORCEPS CVD 16CM(6)
- ROCHESTER PEAN FORCEPS CVD 20CM(12)
- ROCHESTER PEAN FORCEPS STR 20CM(12)
- KOCHER FORCEPS1X2T STR 200MM(6)
- KOCHER FORCEPS1X2T STR 200MM(12)
- INTESTINAL CLAMP STRAIGHT 23 CM(2)
- INTESTINAL CLAMP CURVED 23CM(2)
- KOCHER FORCEPS1X2 CVD 22 CM(6)
- OCHSNER DIXON ATRAUMA FORCEPSSTR 16 CM(2)
- SUTURE INSTRUMENTS TURNABLE(2)
- ALLIS TISSUE ATRAUMA FORCEPS 15,5 CM(12)
- ALLIS TISSUE ATRAUMA FORCEPS 20 CM(12)
- BABCOCK INT TISSUE FORCEPS 16 CM (2)
- BABCOCK INT TISSUE FORCEPS 20,5 CM(2)
- MIXTER DISSECTING FORCEPS 23 CM(1)
- MIXTER DISSECTING FORCEPS 20 CM(1)
- SAROT ART FORCEPS STR 24 CM(2)
- PEAN KIDNEY ATRAUMA FORCEPS 20CM CURVED(2)
- SAROT ART FORCEPS CRD 24 CM(4)
- INTESTINAL CLAMP CRUSHING 27.5CM (2)
- FOERSTER SP FORCEPS STR 24.5SERR(6)
- BACKHAUS TOWEL FORCEPS13.5 CM(12)
- BACKHAUS TOWEL FORCEPS14,5 CM(12)
- DESCHAMPS NEEDLE BLUNT LEFT 20,5 CM(1)
- DESCHAMPS NEEDLE BLUNT RIGHT 20,5 CM(1)
- FRAZIER CANNULA (SET OF 4) 1
- GROOVED DIRECTOR 14,5 CM(1)
- VASCULAR CLAMP SET OF 5(1 SET)
- PROBE WITH EYE 14,5MM, SS(1)
- VOLKMAN RETRACTOR 4 BL PR 21,5(2)
- VOLKMAN RETRACTOR 6 BL PR 21,5(2)
- US ARMY RETRACTOR 21 CM SET OF 2(1)
- PARKER RETRACTOR 18 CM SET OF 2(1)
- BALFOUR DEEP RETRACTOR WITH FLAT (1)
- DENNIS BROWN RETRACTOR SELF RETANING(1)
- KELLY RETRACTOR 50X41X235MM(1)
- KELLY RETRACTOR 74X65X250MM(1)
- DEAVER RETRACTOR 30 CM 25,50,75 MM(1SET)
- RIBBON RETRACTOR 33 CM 25 MM(1)
- RIBBON RETRACTOR 33 CM 50 MM(1)
- YANKAUER SUCTION TUBE CHR 29 CM(1)
- TC DEBAKEY FINE NEEDLE HOLDER(2)
- TC MAYO HEGAR NEEDLE HOLDER 16 CM(2)
- TC MAYO HEGAR NEEDLE HOLDER 18.5 CM(2)
- TC MAYO HEGAR NEEDLE HOLDER 20,5 CM(2)
- PERFORATED STERILIZATION BOX (1)

- All SURGICAL instruments should be CE Or USFDA certified. certificate should be necessarily provided with the tender
- All instruments should be manufacture by ISO 9001:2008,ISO 13485:2003 certified company.
- SURGICAL Instrument made by steel grade AISI 410 and 420, Test report from should be submitted with tender document/at the time of sample.
- Lager marking along with code should be on the instruments
- Bidder should submit original literature/broacher of Quoted Model, Technical compliance detail & should clearly demonstrate having any deviation between technical specifications & broacher/literature of the quoted model.
- Quantity of each instrument is indicated within bracket.

22) Burr hole set

Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected.

Reconstructive purpose:

- FOERSTER-BALLENGER SPONGE HOLDING FORCEPS 20 CM STRAIGHT (4)
- BACKHAUS TOWEL FORCEPS 13CM(12)
- SCALPEL HANDLE NO.3(1)
- SCALPEL HANDLE NO.4(1)
- SCALPEL HANDLE NO.4L(1)
- TOWEL FORCEPS 13CM(12)
- SC METZENBAUM-NELSON SCISSORS BL/BL 18 CM CURVED(1)
- SC TOENNIS-ADSON DISSECTINGECTING SCISSORS 17.5 CM CURVED(1)
- STANDARD OPERATING SCISSORS SH/BL 14.5 CM STRAIGHT(2)
- SC MAYO OPERATING SCISSORS BL/BL 17 CM STRAIGHT(1)
- SC MAYO OPERATING SCISSORS BL/BL 17 CM CURVED(1)
- SC METZENBAUM-DELICATE SCISSORS BL/BL 14.5 CM CURVED(1)
- TC DRESSING FORCEPS 14.5 CM NARROW(1)
- TC POTTS-SMITH TISSUE FORCEPS 21 CM STRAIGHT, 1X2 TEETH(1)
- TC POTTS-SMITH DRESSING FORCEPS 21 CM STRAIGHT(1)
- TC GILLIES TISSUE FORCEPS 15 CM STRAIGHT, CROSS-SERRATED, 1X2 TEETH(1)
- TC MC INDOE DRESSING FORCEPS 15 CM STRAIGHT(1)
- TC GRUENWALD TAMPON FORCEPS 20 CM SERRATED(1)
- TC TISSUE FORCEPS 16 CM NARROW, 1X2 TEETH(1)
- GERALD DRESSING FORCEPS 18 CM STRAIGHT(1)
- GERALD TISSUE FORCEPS 18 CM STRAIGHT, 1X2 TEETH(1)
- STANDARD DRESSING FORCEPS 18 CM STRAIGHT(1)
- HALSTED-MOSQUITO ARTERY FORCEPS 12.5 CM STRAIGHT(12)
- HALSTED-MOSQUITO ARTERY FORCEPS 12.5 CM CURVED(12)
- ROCHESTER-PEAN ARTERY FORCEPS 16 CM STRAIGHT(6)
- TC MAYO-HEGAR NEEDLE HOLDER 16 CM(1)
- TC MAYO-HEGAR NEEDLE HOLDER 18 CM(1)
- LIGATURE CONDUCTOR(1)
- NELATON PROBE 16 CM(1)
- PROBE 14.5 CM / 1 MM FINE(1)
- PROBE 14.5 CM / 2 MM(1)
- MOLLISON RETRACTOR 19 CM SHARP(1)
- MICRO BAYONET SCISSORS 23CM CURVED(1)
- VOLKMANN RETRACTOR 2 PRONGS 21.5 CM SHARP(2)
- WEITLANER RETRACTOR 16.5 CM SHARP, 3X4 TEETH(1)
- ADSON ELEVATOR STRAIGHT 17 CM(1)
- ADSON ELEVATOR CURVED 17 CM(1)
- LANGENBECK ELEVATOR 19.5 CM / 8 MM CURVED (1)

- LAMBOTTE RASPATORY 21 CM / 15 MM(1)
- FARABEUF RASPATORY 15 CM CURVED(1)
- FREER SEPTUM ELEVATOR 18 CM SHART BLUNT(1)
- FRAZIER SUCTION TUBE 17 CM / 6 CHR(1)
- VOLKMANN BONE CURETTE 17 CM FIG.1(1)
- FRAZIER DELICATE HOOK 13 CM FINE(1)
- CUSHING DELICATE HOOK 19 CM FINE, FIG.1(1)
- DELICATE HOOK 1 PRONG 16 CM SHARP(1)
- HUDSON HAND DRILL COMPLETE 27 CM(1)
- OLIVECRONA-GIGLI WIRE SAW, 2x40 CM(1)
- HOOK HANDLE FOR WIRE SAW(2)
- MARTEL CONDUCTOR FOR WIRE SAW 33 CM(1)
- MICRO-DISSEC SCISSORS CVD RSTH 14,5CM(1)
- MICRO-SCISSORS STR RSTH 14,5 CM(1)
- PG SUTURE TYING FORCEPSSTR RH15CM(1)
- PG SUTURE TYING FORCEPSCVD RH15CM(1)
- PG MICRO-NEEDLE HOLDER 0,6MM CVD15CM W/O C(1)
- PERFORATED STERILIZATION BOX(1)

Skin Graft purpose

- FOERSTER SPONGE FORCEPS STR 24.5SERR(2)
- BACKHAUS TOWEL FORCEPS 13.5 CM(6)
- SCALPEL HANDLE#3 125MM(1)
- SCALPEL HANDLE#4 130MM(1)
- MCINDOE DRESS FORCEPS15 CM(1)
- SC KILNER NASAL SERRATED SCISSORS 12CM STR SH(1)
- SC MCINDOE SCISSORS SERRATED 18,5 CM STR(1)
- GILLIES SKIN HOOK SHARP 18(2)
- MINI-LANGENBECK RETRACTOR 17X5MM(2)
- ALLIS ATRAUMA TISSUE FORCEPS5X6 15,5 CM(4)
- HALSTED-MOSQUITO FORCEPS STR 12CM(6)
- HALSTED-MOSQUITO FORCEPS CVD 12CM(12)
- STEEL RULER 15 CM, IN MM(1)
- HUMBY DERMATOME 32 CM(1)
- SPARE BLADE (4)
- TC CRILE WOOD NEEDLE HOLDER 15 CM(1)
- PERFPRATED STERILIZATION BOX(1)

- All SURGICAL instruments should be CE Or USFDA certified. certificate should be necessarily provided with the tender
- All instruments should be manufacture by ISO 9001:2008,ISO 13485:2003 certified company.
- SURGICAL Instrument made by steel grade AISI 410 and 420, Test report from should be submitted with tender document/at the time of sample.
- Lager marking along with code should be on the instruments
- Bidder should submit original literature/broacher of Quoted Model, Technical compliance detail & should clearly demonstrate having any deviation between technical specifications & broacher/literature of the quoted model.
- Quantity of each instrument is indicated within bracket.

23) Vascular set (1 in each O.T.)

Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected.

- SC METZENBAUM SCISSORS CVD DEL 23.5CM(1)
- SC METZENBAUM SCISSORS CVD DEL 20 CM(1)
- HALSTED-MOSQUITO FORCEPS STR 12CM(12)
- HALSTED-MOSQUITO FORCEPS CVD 12CM(12)
- BACKHAUS TOWEL FORCEPS 9 CM(12)
- DEBAKEY FORCEPS 1MM 20CM(1)
- ALLIS ATRAUMA TISSUE FORCEPS 20CM(6)
- DEBAKEY GERALD FORCEPS 18CM(1)
- FOERSTER SPONGE FORCEPS CVD 24,5 SERR(6)
- TG CRILE WOOD NEEDLE HOLDER 15 CM(2)
- TG CRILE WOOD NEEDLE HOLDER 18 CM(1)
- TG CRILE WOOD NEEDLE HOLDER 23 CM(1)
- TC MICRO NEEDLE HOLDER 20CM CURVED WITH LOCK(1)
- MICRO CONORAY SCISSORS 45 DEGREE(1)
- MICRO CONORAY SCISSORS 125 DEGREE(1)
- SC POTTS-SMITH VASC SCISSORS 18,5CM 45°(1)
- COOLEY SUCTION TUBE 36CM(1)
- COOLEY SUCTION TUBE 35 CM(1)
- MICRO RING FORCEPS LIGHT WEIGHT 20CM(1)
- YANKAUER SUCTION TUBE CHR 29 CM(1)
- VOLKMAN RETRACTOR 3 SH PR 21,5(2)
- VOLKMAN RETRACTOR 3 BL PR 21,5(2)
- CUSHING VEIN RETRACTOR 22,5 CM(2)
- COOLEY-DERRA ATRAUMA FORCEPS 18CM(1)
- FINOCHIETTO RETRACTOR LIGHT WEIGHT(1)
- TC DEBAKEY NEEDLE HOLDER ULTRA FINE (1)
- RICHARDSON-EASTMAN RETRACTOR SET(1)
- AG TITANIUM DEBAKEY SATINSKY CL 24 CM(1)
- AG TITANIUM DEBAKEY AORTIC FORCEPSANG 26 CM(1)
- AG COOLEY ANAST FORCEPS17,5 CM(1)
- DEBAKEY TITANIUM GLOVER FORCEPSSTR 20,5CM(1)
- LELAND-JONES PER. VAS.15ANGL(1)
- AG DEBAKEY MULTI PURPOSE CLAMP ANG 20CM(1)
- AG COOLEY LIG FORCEPS16CM SM CVD(1)
- DEBAKEY AORTA-ANEU CLAMP 26CM(1)
- DEBAKEY ATRAUMA BULLDOG CLAMP STRAIGHT SET OF 4(1)
- DEBAKEY ATRAUMA BULLDOG CLAMP CURVED SET OF 4(1)
- DEBAKEY SEMB LIGAT.CARRIER(1)
- AG COOLEY ILIACA CL 21CM (1)
- AG COOLEY ILIACA CL 27CM(1)
- AG COOLEY RENAL ARTERY CLAMP 27,5CM(1)
- DEBAKEY GLOVER FORCEPS STR 20,5(1)
- TC WIRE CUTTING SCISSORS 23 CM(1)
- PERFORATED STERLIZATION BOX(1)

- All SURGICAL instruments should be CE Or USFDA certified. certificate should be necessarily provided with the tender
- All instruments should be manufacture by ISO 9001:2008,ISO 13485:2003 certified company.
- SURGICAL Instrument made by steel grade AISI 410 and 420, Test report from should be submitted with tender document/at the time of sample.
- Lager marking along with code should be on the instruments

- Bidder should submit original literature/broacher of Quoted Model, Technical compliance detail & should clearly demonstrate having any deviation between technical specifications & broacher/literature of the quoted model.
- Quantity of each instrument is indicated within bracket.

24) Diagnostic Laparoscope (7 Nos.), Operative Laparoscope (2 Nos), and Resectoscope (4 Nos)

Please refer to the Note provided at the end for the Technical Specifications of Instruments. Complete set of Instruments should be quoted otherwise the bids shall be summarily rejected:

Part A. High Definition Camera System for Laparoscope and Resectoscope

Each set should consists of following items:

1. Full High Definition Digital Camera

- It should have pure digital signal with high definition video of 1920x1080p (min) native resolution and progressive scan technology both on camera head and console, Should have controls on camera console and camera head.
- It should be compatible with Aspect ratio of 16:9
- The system should have Optical zoom to enhance the quality of Image size & cross specialty standardization of the camera system, regardless of the telescope used.
- Zoom, white balance control and two peripheral controls on camera Head
- Integrated Gain/Shutter/Enhancement with automatic brightness control
- Video Outputs: two DVI, one SVHS and one direct fiber optic output
- The system should automatically optimize all settings. The system should be ready- to- use as soon as it is connected to the camera control unit.
- The system should be Menu driven, thus allowing the surgeon to program the camera head functions as per the surgical needs & requirement.
- The system should have coupler, which can be used with any make of standard laparoscopes, cystoscopes and resectoscopes

2. LED Light Source

- 220 Volts, 225-300 watts.
- Light Engine: Red, Green & Blue Led's,
- Increased patient safety & added protection in OR with safelight technology Intuitive simple user interface with LCD touch screen.
- Standby Mode
- Universal Jaw Assembly to adapt any make of Fiber Optic Cable
- Should have more than 5000 hours bulb life

3. Fiber Optic Light Cable

- Size should be diameter > 5.5mm, length >160 cm

4. High Resolution Monitor

- High Definition LED 26" or more Flat Panel Monitor
- PAL system compatible
- Composite, S-Video and DVI inputs
- Compact & Lightweight design
- Resolution over 1100 lines, Native Resolution 1920 x 1080p or above.
- The monitor should support Direct Fiber input.

5. Insufflators

- High flow of 45ltr or above with LCD display
- Microprocessor controlled & Software driven for upgradeability

- Soft approach pressure control for safe recovery of abdominal pressure
- Should have Neonatal mode & visual and audible alarms with min 0.1 L flow rate internal leakage detection capability
- Integrated Gas heating, having internal venting system for safety
- Should have video on screen display; Unit should include heated tubing, hose & yoke

6. Suction irrigation pump

- Should have total fluid consumption:0-3l
- Average operation time of pump: 2min---10min
- Should have irrigation flow rate: 0-2l/min
- Should have irrigation pressure: 0-750mmHg
- Should have Suction floe Rate: 0-2l/min
- Should have Suction pressure: 0-600mmHg
- Should have reusable tube set
- Should have irrigation floe rate max: 8l/min. Should have suction vacuum pressure for suction
- Should have suction flow rate max: 1-8l/min, should have suction pressure: 60KPa

7. Desktop / Laptop Computer with Laser Printer

- Should be supplied with Desktop / Laptop having Recording Device along with Laser Printer.

8. Trolley (Indian)

- Trolley should be capable to mount above-mentioned system
- Should have space to keep CO2 cylinder
- Should have movable arm to mount monitor

All the items except trolley & Desktop/Laptop should be of same manufacturer for system compatibility, all items except trolley should be USFDA or European CE certified, certificate should be submitted with tender documents.

Part B. Telescopes for both Operative & Diagnostic laparoscope and Resectoscope

Each set should consists of following items with quantity as specified against each item:

1. <u>Instruments for Laparoscopy</u>

(i) Telescopes

High definition wide Angle Full Screen, Forward-Oblique and lateral scope, Optimal center-to-edge resolution for enhanced picture quality, Fiber optic light transmission incorporated, Standard ocular window for coupling the camera head, Scratch resistance sapphire quoted tip lens

- Angle of view: 30º, Diameter 10 mm, Length 30cm, Qty 01
- Angle of view: 0º, Diameter 5 mm, Length 30cm, Qty 01

(II). Laparoscopic Hand Instruments & Accessories:

(a) Trocars & Reducers, Qty 01 each type

- Trocar 10 mm with Cannula - 2 Nos
- 120 mm Veress Needle
- 5 mm Aspiration Needle, 17 Gauge, 33cm
- 5.5 mm Cannula Sleeve with Automatic Valve, Stop Cock **(3 Each)**
- Trocar, Pyramid Tip, 5.5 mm **(3 Each)**

(b) 5mm Hand Instruments, with Insulated Shaft, Modular Design, Inner Shaft Flush Port, 360º Rotation & Shaft Rotation Lock, dismantalabe into 2/3 pieces (Handle & Insert), Qty 01 each type with Double Locking Mechanism.

- Right Angled Dissector 33 cm
- Curved Kelly Dissector 33 cm
- Maryland Dissector 33 cm
- Alligator Grasper 33 cm
- Fundus Grasper 33 cm
- Cobra Tooth Grasper 33 cm
- Serrated, Fenestrated Grasper 33 cm
- Paddle Babcock Grasper 33 cm
- Debakey Grasper 33 cm
- Curved Metzenbaum Scissors 33 cm
- 5mm Hook Scissors 33 cm
- Suction irrigation cannula
- Needle Holder - 01 No.

(c) 10mm Hand Instrument, with Insulated Shaft, Modular Design, Inner Shaft Flush Port, 360º Rotation & Shaft Rotation Lock, dismantalabe into 2/3 pieces (Handle & Insert), Qty 01 each type

- Allis Grasper 33 cm
- Pennington Grasper 33 cm
- Double Action Claw Grasper 33 cm
- Mixter Dissector
- Clip applicator for medium/medium large clips.

2. <u>Instruments for Resectoscope Set</u>

(i) Telescope

- Forward Viewing HD 4mm Telescope 30 degree & 0 degree, enlarged view, autoclavable, fiber optic transmission incorporated – 1No.

(i) Instruments, qty 01 of each type

- 24 Fr Standard Flow Resectoscope sheath (Inner).
- 24/26 Fr Continuous Flow sheath set(Inner/Outer).
- 24/26 FrResectoscope Standard Obturator.
- 24/26 FrResectoscope Visual Obturator.
- Working Element-Passive (Iglesias).
- Working Element- Active (Baumrucker).
- Bladder Syringe Adapter, Inner sheath.
- Bladder syringe adapter, Outer sheath.
- Ellik Evacuator.
- Ellik adapter, Inner Sheath.
- Ellik adapter, Outer Sheath.
- Laser bridge (for use with straight fire laser).
- Stone Crushing Forcep Adapter, Outer Sheath.
- 27 Fr Standard Flow Resectoscope Sheath Adapter.
- 24Fr 30 degree Cutting Loop Electrode, .012 (minimum 10 Nos. each).
- 24 Fr 90 degrees Cutting Loop Electrode, .012 (minimum 10 Nos. each).

All the three sets should be imported and should be European CE or USFDA approved.

The quantity of each items under Part A should be of 5 Nos each.

The quantity of items under Part B are indicated within bracket; **Diagnostic Laparoscope (7 Nos.), Operative Laparoscope (2 Nos), and Resectoscope (4 Nos)**.

Part "A" and Part "B" should be compatible with each other

25) Bronchoscope Video Flexible

1. It should have superior image quality with crisp, clear images and true-to life colour preferably HD images.
2. Should have facility for pressure regulated leakage testing.
3. Scope should have minimum three user programmable remote switches to improve operability.
4. Should have Narrow Band/ I-SCAN/ FICE Imaging facility.
5. Outer diameter should be 5.8 – 6.3 mm.
6. Inner Channel diameter should be beatless 2.8 – 3.2 mm.
7. Insertion tube length should be 600 mm or more.
8. Field of view should be 120 degree or more.
9. Depth of field should be 3-50 mm or better.
10. Angulation – UP-180 degree, Down-130 degree or better.
11. Minimum visible distance should be 3mm or less.
12. Should be compatible with laser and electrocautery.
13. Should have scope ID function.
14. The equipment/system should be USFDA/European CE approved.
15. The equipment should be supplied with the following standard accessories:

A) Video Processor:

- Should be compatible with Analog, HD-SDI and DVI output & 16:9 & 16:10 output for a HDTV monitor should be available.
- Should contain the electronics to operate dual focus for clear visibility of near & far objects.
- Equipped with high resolution HDTV Imaging capacity.
- Compact, light weight and ergonomically designed.
- NBI/FICE or I-scan capacity for compatibility with NBI/FICE or I-Scan Videoscopes.
- Recording of both still & moving images.
- It should have structure and edge enhancement option for better image quality.
- In-built/Portable Memory & USB Slot for image recording.
- Automatic IRIS control & automatic white balance.
- Picture in Picture display & Index functionability.
- Electronic Zoom at least up to 1.5X.
- Equipped with memory back up.
- Should have pre-freeze function for image stabilization.
- It should be compatible with EBUS (Endo-bronchial ultrasound) scope.

B) Light Source (Xenon short arc Ozone free 300 Watt lamp):

-Xenon light with scope compatibility having lamp life of at least 500 hours.
- Emergency halogen/LED light for backup.

C) High Definition LCD Monitor:

- At least 21 inch full HD LCD monitor with high resolution 1920X1080 (WXGA).
- Lower Power consumption.
- Aspect ratio 16:10.
- Should have Picture-in-Picture and Picture-out-Picture for viewing side-by-side split screen images.

D) Compact Trolley

- Should be made of Stainless steel capable of carrying the weight of all the equipments.
- Should have multiple shelves to keep accessories mentioned.

E) Essential Accessories

A) FORCEPS
i) Foreign Body Forceps
- Rubber Tip - 2
- Alligator Jaw/crocodile - 2
- Retrieval basket - 1

ii) Biopsy Forceps – plain - 5, toothed - 3
iii) Reusable standard type fenestrated cup biopsy forceps 1.8 mm – 2.0 mm diameter – 20 Nos.

B) Cytology brushes with sheath – 8
C) TBNA Needles with sheath – 10 sets
D) Biopsy valves (Reusable) 2
E) Suction valves (Reusable) 10
F) Cleaning brushes (Reusable) 2
G) Bite block (Reusable), Small - 2
H) Bite Block Large – 2
I) Leakage tester- 1
J) Cleaning and maintenance kit- 1
K) All necessary cables & adapters.
L) Eye Shields – 10
M) Silicon Oil spray – 500 ml (4 Nos) – nontoxic, non-inflammable, non-stain and of Medical Grade.

F) Computer and accessories- At least 3rd generation Intel Core i7 processor, 8GB RAM, 18"-20'' TFT Color Monitor DVD R/W, Keyboard, Mouse, Windows 7/8, Hard Disc Drive (At least 500 GB) and Laser color Printer, Trolley & 1KVA Online UPS, to be supplied.

G) Software for video-recording and CD-storage of bronchoscopic procedure

H) Voltage stabilizer/UPS

All the accessories mentioned above should be supplied by the same manufacturer as that of the bronchoscope or USFDA approved/certified if being provided from a company other than the manufacturer of bronchoscope

I) Terms & Conditions:

1. Prices for the consumable accessories should be quoted for the next 7 years.
2. The company should furnish a certificate that the model quoted is latest and not obsolete and the spares will be available for next 5-7 years.
3. Approval of the equipment would be subject to the working demonstration of bronchoscope / accessories, if required.

26) Laser

Should have following features:

- It should be able to fragment calculi of any size in the bladder, ureter or kidney and any stone fragment
- It should have power output of 20watts.
- It should have repetition rate of 5-15Hz.
- It should have Energy per Pulse of 0.5 - 2.5 Joules
- It should have pulse duration upto 500 microseconds.
- It should have Green-aiming beam of 1.0mw at 532nm, 3 intensity settings.
- It should have a closed loop, self-contained water to air exchanger cooling system.
- It should be useable with single phase 230V AC 50/60Hz,
- It should have Case saver mode to allow to finish the procedure if system does not deliver full energy due to some fault.
- It should have a shield to protect the Lase machine from Fiber misalignment or misfire
- **It should be supplied with following accessories:**
  - 365 Micron Reusable, Flexible Fiber - 5
  - 200 micron Reusable, Flexible Fiber - 5
  - 365 Micron Stripping and cleaving (set) - 2
  - 200 Micron Stripping and cleaving (set) - 2
  - Fibre Inspection Scope- 1
  - Ceramic Scissors- 2
- Should be USFDA approved

27) Operating microscope-binocular with Video monitor

Technical Specification of Zoom Surgical Microscope

Operating Microscope:	Pentero Compatible.
Magnification:	Microscope should have Zoom 6:1, motorized.
Working distance:	Variable working distance range of from 200 -470 mm motorized, manual or via autofocus adjustable speed.
Focusing:	Motorized as well as Manual via multifocal lens.
Eye piece:	Wide –field eyepiece for spectacle wearers 10x/21B or 12.5X.
Objective:	Multifocal 200mm-470mm working distance.
Illumination:	300W Xenon lamp through fiber optic cable and emergency backup illumination.
Power Supply:	Should have two completely independent lamp illumination systems with two separate power supplies.
Control unit:	Graphic LCD display with background lighting, menu with up to 10 user defined setting.
Binocular tube:	Variable angle of observation with focal length=200mm adjustable inter-pupillary distance, 0-180 deg binocular tubes for main surgeon as well as opposite & side observer.
Magnification:	1.2x-12.8x with 10x eye piece.
Field of View:	16.5mm-180mm with 10x eyepiece.
Automatic Iris Control:	Microscope should have automatic iris control to match the field of view.

IGS (Image Guided Surgery): Should have Neuro navigation system for IGS (MRI,CT Images).

Focus Light Link:	Automatically limits brightness.

Hand grips: Controls for microscope zoom adjustments, controls for variable working distance & focus via multifocal lens.
Balancing: Should have manual A&B balancing for optics carrier.
Stand: Floor stand with large wheel for transportation.
Over Head Design: Over Head design, Height not less than 1900 mm.
Safety features:

a) All cables should be integrated in the stand for protection.
b) Should have automatic working distance controlled light intensity to avoid tissue burn.
c) Should have automatic magnification controlled illumination. Size of diameter automatically works with zoom to avoid unnecessary exposure to light.

Accessories:

a) Side observer: Should have side observer tube.
b) Camera: Should have HD camera with HD monitor.
c) Recorder: Should have HD recording Systems.

Certification: Should be US FDA Approved.

28) Stapling device Assorted

i. Gastro Intestinal Anastomotic Stapler 60 mm with dual firing knob.
ii. Gastro Intestinal Anastomotic 60 mm cartridge with fresh knife – a) 60 mm blue cartridge, b) 60 mm green cartridge, c) 60 mm white cartridge.
iii. Gastro Intestinal Anastomotic Stapler 80 mm green with dual firing knob.
iv. Gastro Intestinal Anastomotic 80 mm cartridge with fresh knife - a) 80 mm blue cartridge, b) 80 mm green cartridge.
v. Gastro Intestinal Anastomotic Stapler 100 mm green with dual firing knob.
vi. Gastro Intestinal Anastomotic 100 mm cartridge with fresh knife - a) 100 mm blue cartridge, b) 100 mm green cartridge.
vii. Curved End to End Anastomotic Stapler 25 mm/ 28mm/ 31mm/ 34mm with Tilt-Top Anvil.
viii. Linear Stapler 45 mm Green Gun.
ix. Linear Stapler 45 mm Cartridge - a) 45 mm green cartridge, b) 45 mm blue cartridge.
x. Linear Stapler 60 mm Green Gun.
xi. Linear Stapler 60 mm Cartridge - a) 60 mm green cartridge, b) 60 mm blue cartridge.
xii. Endo Gastro Intestinal Anastomotic Universal XL Stapler can accommodate all sizes of cartridges.
xiii. Endo Gastro Intestinal Anastomotic 60 mm cartridge with fresh knife - a) 60 mm blue cartridge, b) 60 mm green cartridge, c) 60 mm white cartridge, d) 45 mm blue cartridge, e) 45 mm green cartridge, f) 45 mm white cartridge, g) 30 mm white cartridge, h) 30 mm blue cartridge.
xiv. Endo Gastro Intestinal Anastomotic articulated 60 mm medium/thick cartridge with fresh knife and three different staple heights.
xv. Endo Gastro Intestinal Anastomotic articulated 60 mm Vascular/medium cartridge with fresh knife and three different staple heights.
xvi. Endo Gastro Intestinal Anastomotic articulated 60 mm extra thick cartridge with fresh knife and three different staple heights.
xvii. Endo Gastro Intestinal Anastomotic articulated 45 mm medium/thick cartridge with fresh knife and three different staple heights.
xviii. Skin Stapler Extractor.
xix. Disposable Skin Stapler.
xx. Heamorrhoid Stapler 33 mm diametre with detachable anvil and staple height 3.5 mm/4.8 mm.
xxi. 5 mm optical trocar.
xxii. 12 mm optical trocar.
xxiii. 15 mm bladeless trocar.
xxiv. Preloaded Automatic Clip Applier 9.75 Inches
xxv. Preloaded Automatic Clip Applier 11.5 Inches.
xxvi. Laparoscopic Preloaded Clip Applier 5 mm.
xxvii. Laparoscopic Preloaded Clip Applier 10 mm.
xxviii. Transverse linear Cutting Stapler size 75mm, 50mm, 100mm.
xxix. Skin staplers.
xxx. Stapler remover
xxxi. Dermabond.

29) Endo-stapler

Endo Stapling System prepares surgeons to work with certainty to handle the broadest range of tissues and provisions with remarkable clinical results. The Endo Cutter should be ergonomically designed, precise articulation, and one-handed grasping, for expanded flexibility improving the user experience. The Endo stapler should have distinguished curved tip reload (with open adaptable introducer) to furnish surgeons with improved direct visualization, aids access to the surgical site, and the capability to analyze and control tissue and vessels in different testing stapling applications. The Endo stapler should have extraordinary dark reloads to prepare surgeons to surely and reliably staple in additional thick tissue requisitions long ago past the signs of any MIS stapler.

30) Slow Suction Machine

Electrically operated pressure controlled slow suction machine.

Description of function: To extract fluid from body during emergency treatment.

Technical specifications:

1. Suction unit should have fast vacuum build up
2. Vacuum should be maximum 7.5-60 mm Hg with Suction capacity 8 ltr/min.
3. System should have qutra flex-driving unit/motor.
4. Should have mechanical overflow protection system.
5. Should have facility for electric as well as battery operation. Should be fitted on mobile imported trolley.
6. Should be USFDA and European CE approved.

Standards, safety and training:

(i) It should be European CE
(ii) Manufacturer/supplier should have ISO certification for quality standards.

31) Nebulizer

i. Should be Portable and easy to carry.
ii. Should be Electrical and/or battery operated with low power consumption.
iii. Should be Simple to operate, noiseless and discreet.
iv. Can nebulise effectively for up to 10 seconds in all directions (i.e. upside down or rotated to any angle).
v. Should be automatically shuts down at the end of inhalation
vi. Particle size: MMAD < 4 microns.
vii. Nebulisation rate: > 0.3 ml / min.
viii. Aerosol output: > 0.8 ml .
ix. Aerosol output rate: >0.07 ml / min.
x. Sound: Noise level at 1 m distance 50 dB.
xi. Method of operation: ultrasonic.
xii. Recommended fill volume: Approx. 8 ml maximum; approx. 0.5 ml minimum.
xiii. Operating conditions: 10 – 40 degrees C, 30 – 85% RH.
xiv. Warranty and AMC must include (but not limited to) all electrical and electronic parts, plastic, metallic, glass and rubber parts.
xv. Consumable accessories, if any, not covered in warranty/AMC should be clearly specified

32) Cystoscope- Pediatrics

1. Full High Definition Digital Camera

- It should have pure digital signal with high definition video of 1920x1080p (min) native resolution and progressive scan technology both on camera head and console, Should have controls on camera console and camera head.
- It should be compatible with Aspect ratio of 16:9
- The system should have Optical zoom to enhance the quality of Image size & cross specialty standardization of the camera system, regardless of the telescope used.
- Zoom, white balance control and two peripheral controls on camera Head
- Integrated Gain/Shutter/Enhancement with automatic brightness control
- Video Outputs: two DVI, one SVHS and one direct fiber optic output
- The system should automatically optimize all settings. The system should be ready- to- use as soon as it is connected to the camera control unit.
- The system should be Menu driven, thus allowing the surgeon to program the camera head functions as per the surgical needs & requirement.
- The system should have coupler, which can be used with any make of standard cystoscopes.

2. LED Light Source Qty-1

- 220 Volts, 225-300 watts.
- Light Engine: Red, Green & Blue Led's,
- Increased patient safety & added protection in OR with safelight technology Intuitive simple user interface with LCD touch screen.
- Standby Mode
- Universal Jaw Assembly to adapt any make of Fiber Optic Cable
- Should have more than 5000 hours bulb life

3. Fiber Optic Light Cable Qty-1

Size should be diameter > 5.5mm, length >160 cm

4. High Resolution Monitor Qty-1

High Definition LED 26" or more Flat Panel Monitor
PAL system compatible
Composite, S-Video and DVI inputs
Compact & Lightweight design
Resolution over 1100 lines, Native Resolution 1920 x 1080p or above.
The monitor should support Direct Fiber input.

5. Insufflators Qty-1

High flow of 45 ltr or above with LCD display
Microprocessor controlled & Software driven for upgradeability
Soft approach pressure control for safe recovery of abdominal pressure
Should have Neonatal mode & visual and audible alarms with min 0.1 L flow rate internal leakage detection capability
Integrated Gas heating, having internal venting system for safety
Should have video on screen display; Unit should include heated tubing, hose & yoke

6. Suction irrigation pump Qty-1

Should have total fluid consumption:0-3l
Average operation time of pump: 2min---10min
Should have irrigation flow rate: 0-2l/min

Should have irrigation pressure: 0-750mmHg
Should have Suction floe Rate: 0-2l/min
Should have Suction pressure: 0-600mmHg
Should have reusable tube set
Should have irrigation floe rate max: 8l/min.
Should have suction vacuum pressure for suction
Should have suction flow rate max: 1-8l/min, should have suction pressure: 60KPa

All the items except trolley should be of same manufacturer for system compatibility, all items except trolley should be USFDA or European CE certified, certificate should be submitted with tender documents.

7. Trolley (Indian) Qty-1

Trolley should be capable to mount above-mentioned system
Should have space to keep CO2 cylinder
Should have movable arm to mount monitor

8. Telescope and Instruments for Cystoscopy

- Compact integrated pediatric cystoscope 12 deg, size 8/9 Fr, working channel 5 Fr., working length 150mm, fiber optic transmission incorporated
- Coagulation Button electrode, size 3Fr., working length 250mm
- Coagulation Needle electrode, size 3Fr., working length 250mm
- Monopolar high frequency cord
- Grasping forceps, size 4/5 Fr
- Biopsy forceps, size 4/5 Fr
- Micro scissor, size 4/5 Fr

All the items except trolley, telescope and Instruments for Cystoscopy should be of same manufacturer for system compatibility, all items except trolley should be USFDA or European CE (EN type) certified, certificate should be submitted with tender documents.

33) Rigid Bronchoscope (Sets)

Should include following items:

a.	Straight Forward Telescope 0°, diameter 4.5 mm, length 50 cm autoclavable. Fiber optic light transmission incorporated	ONE
b.	Bronchoscope Tube Universal, without distal fiber optic light carrier, for use with proximally insertable prismatic light deflector and plugs length 43 cm, size 8.5	ONE
c.	Bronchoscope Tube Universal, without distal fiber optic light carrier for use with proximally insertable prismatic light deflector and plugs length 43 cm, size 7.5	ONE
d.	Bronchoscope Tube Universal, without distal fiber light carrier, for use with proximally insertable prismatic light deflector and plugs length 43 cm, size 6.5	ONE
e.	Prismatic Light Deflector, autoclavable, with connection fiber optic light cable.	ONE
f.	Glass Window Plug	ONE
g.	Rubber Telescope Guide	ONE
h.	Adaptor with sliding glass window plug, sealing cap, notched lens and keyhole opening, movable, for use with Full Lumen Tracheoscopes and Bronchoscopes	ONE
i.	Injection Cannula, for positive pressure assisted ventilation system, O.D. 3.5 mm for use with bronchoscopes and tracheoscopes with	

j.	LUER-lock	ONE
k.	Instrument Guide, for suction catheter	ONE
l.	Adaptor from bronchoscope to respirator	ONE
m.	Optical Bronchoscopic Forceps, circular cup, alligator for hard foreign bodies	ONE
n.	Optical Bronchoscopic Forceps, for peanut and soft foreign bodies With spring- action handle	ONE
o.	Optical Bronchoscopic Forceps, round cupped jaws for Biopsy, cup diameter 3.3mm	ONE
p.	Optical Bronchoscopic Forceps, Universal for biopsy, for removing foreign bodies and denatured tissue	ONE
q.	Rigid Suction Tube, diameter 4mm, working length 50 cm	ONE
r.	Rigid Suction Tube, diameter 2.5mm, working length 50 cm	ONE

LED Light Source 170-180 watt should have one Light outlet.
It should have touch keys to adjust light intensity (Increase and decrease).
Unit should be compatible to use in the sterile area through touch screen remote control / voice control.
It should have stand by button for lowest intensity in case of no use of light.
Unit should have memory function to restore intensity value It should have minimum life of LED 30000 Hrs.
Unit should give display of light intensity.
Fiber optic Cable Dia 3.5 mm length 230 cm.
Unit should have European CE and USFDA Certificate.
Principal Company should have service centre in Delhi/NCR.

Pediatric

Bronchoscope, length 30 cm, size 6	ONE
Bronchoscope, length 30 cm, size 5	ONE
Bronchoscope, length 30 cm, size 4.5	ONE
Bronchoscope, length 30 cm, size 4	ONE
Bronchoscope, length 30 cm, size 3.7	ONE
Bronchoscope, length 30 cm, size 3.5	ONE
Bronchoscope, length 26 cm, size 4	ONE
Bronchoscope, length 26 cm, size 3.5	ONE
Bronchoscope, length 18.5 cm, size 3.5	ONE
Bronchoscope, length 18.5 cm, size 2.5	ONE

a.	Compatible Telescopes for above mentioned Bronchoscope tubes, Straight Forward- scope 0°, auto- clavable. Fiber optic light transmission incorporated	ONE Each
b.	Compatible Optical Alligator Forceps for Pediatric Broncho-Esophagoscopes, for use with Telescope forced controlled handle for removal of hard foreign bodies	ONE Each
c.	Compatible Optical Forceps for Pediatric Broncho-Esophagoscopes, with large Jaws, for use with telescope forced controlled handle for removal of peanuts and soft foreign bodies	ONE Each
d.	Compatible Optical Forceps, for biopsy.	ONE Each
e.	Compatible Optical Pediatric Scissors,	ONE Each

f. Compatible Optical Forceps for biopsy and grasping ONE Each
g. Prismatic Light Deflector, Autoclavable, with Connection to fiber light cable ONE
h. Glass window Plug ONE
i. Rubber Telescope Guide for use with Telescopes or optical forceps ONE
j. Adaptor with sliding glass window plug sealing cap, notched lens and keyhole opening, moveable. ONE
k. Adaptor from bronchoscope to respirator ONE
l. Instrument guide, for suction catheter Injection Cannula for positive pressure assisted ventilation system, O.D. 3.5 mm and 2.7mm with LUER-lock ONE
m. Compatible Suction tube, straight, with rubber tip, diameter 2mm Working length 35cm ONE
n. Cotton Applicator, working length 35cm, ONE
o. Sponge Holder, spring handle, working length 35cm ONE

34) Oesophageal Dilators (Sets)

a) Maloney (tapered) 21-piece full set: 21 bougies, 20-60 FR.
b) Maloney (tapered) 10-piece mini-set: 10 bougies, 36-54 FR.
c) Hurst (blunt) 21-piece full set: 21 bougies, 20-60 FR.
d) Hurst (blunt) 10-piece mini-set: 10 bougies, 36-54 FR
e) Bougie Storage Case: Heavy-duty storage for up to 46 bougies. 32″L x 7″W x 4″H.

35) Pediatrics Sigmoidoscope Video Flexible

i. Viewing direction-forward
ii. Observation Range-4-100 mm
iii. Field of view -140
iv. Distal end diameter-12.8mm
v. Flexible portion-12.8mm
vi. Bending capability
  a. Up-180
  b. Down-180
  c. Left-160
  d. Right-160
vii. Working length-790mm
viii. Total length-1000mm.

36) 300 mA X-Ray Unit with Table & IITV

HF X-ray Generator:

1. The X-ray Generator should be high frequency inverter type of constant output.
2. Output should be 30 KW or more.
3. mA Range 40mA to 300mA or more at 100 KV.
4. KV range 40 KV-125KV or more.

5. Automatic mains compensation with LED lights of indication.
6. Selection switches for radiography/fluoroscopy/bucky etc.
7. Digital display of KV, mA, Sec & mAs
8. It should have 5" or more LCD display for mA, KV & mAs.
9. It should have Multiple Anatomical programming radiography should be possible with user programmable settings.
10. Exposure facility to be available both by hand switch and from control panel.
11. Unit should be supplied with 2 Nos. rotating anode dual focus X-ray tube 1 tube should be provided with light beam collimator & cone attachment. Second tube should be provided for under couch operation for fluoroscopy. Focal spot of the X-ray tube should be 1mm small focus & 2mm large focus.
12. 9" I.I.T.V. Chain should be provided with 17" Monitor and memory system for daylight fluoroscopy system.
13. Spot Film Device (SFD) with capability to hold following sizes of Cassettes: 14"x14", 12"x10" & 10"x8" with sub-division in 1:3, 1:2 & 1:4.

X-ray Tube Unit:

1. The X-ray tube should be rotating anode compatible with the HF generator and must have dual focus. Focal spots of following sixes:
   i) Large Focus: not more than 2 mm or better.
   ii) Small Focus: not more than 1 mm or better.
2. Collimator with auto shut provision for the light.
3. The Tube Rating shall be 20/40 KW (Over Couch) & 20/40 KW (Over Couch) or better.

X-ray Table:

1. Horizontal X-ray Table with thin floating table top of Radio Translucent material.
2. It should have transverse +/- 10cm or more and longitudinal movements +/- 30cm or more with electromagnetic brakes.
3. Multiposition motorized table from -12 to +90 degrees movements with high speed bucky with moving grid of 10:1 and 100 lines or more.
4. Floor to ceiling type fully counter balanced tube column stand.
5. It should have bucky which can hold all standard size of cassettes up to 14"x17" including 14"x14".
6. Bucky should have a grid ratio 8:1 or more with 100 lines or better & the Vertical Chest Bucky System should be provided as standard.

Tube Column Stand:

1. Floor to ceiling support column/ceiling free stand with easy up/down movement of tube arm with facility for electromagnetic lock in all movement.
2. It should be counter balanced & have locking System for all movements.
3. It should have +/- 90 degrees rotation of the base for various positions.
4. Tube should have rotation of +/- 90 degrees for angulated exposures.

Other Accessories:

1. Floor Mounted Full Length Chest Stand.
2. Abdomen Binder.
3. Hand Support.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE/ US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable.
2. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
3. The Bidder is required to carry out minor modification in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for

satisfactory working of the equipment.

4. The company shall construct the protection chamber with 100 cm x 120 cm Lead Glass Window of 2mm thick lead equivalent or provide Stand Alone Radiation Protection Shield for all Radiological Equipments, wherever applicable/needed.
5. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.
6. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
7. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

37) 500 mA X-Ray Fluoroscopy Unit with Table & IITV

A. Generator:

Generator should be high frequency type for constant output & Microprocessor controlled.

Output 50 KW or more.
KV range 40 KV – 125 KV or more.
Output at 100 KV should be 500 mAs or more.
It should have digital display of KV & mAs.
It should have over loading protection.
I.I.T.V. 9" Chain should be provided with 17" Monitor and memory system for daylight fluoroscopy system.
Spot Film Device (SFD) with capability to hold following sizes of Cassettes: 14"x14", 12"x10" & 10"x8" with sub-division in 1:3, 1:2 & 1:4.

B. X – Ray Tube, Collimator & Column Stand:

The x-ray tube should be rotating anode high speed, compatible with the generator and must have dual focus.
Focal spots of following sizes:

Large Focus: 1.2/2.0 mm or better.
Small Focus: 0.6/1.0 mm or better.

Tube with anode heat storage capacity 300 KHU or more.
Tube rating for both over & under couch should be 30 / 50 KW.
Motorized collimator having additional filters (for Dose Reduction), auto shut provision for the light.
Counterbalanced floor/floor to ceiling stand with rotation of both tube as well as column with electromagnetic locking system for smooth positioning.

C. X – Ray Table:

Motorised Examination Table:

1. The table should move from -12 degree Trendlenburg position to vertical with Automatic stop at Horizontal, Vertical & Trendlenburg position.
2. Automatic Spot Film Device capable of doing all routine Spot Filming (4 on 1, 2 on 1, 1 on 1) for use with 8" x 10", 10" x 12", 14" x 14" cassettes should be provided.

3. Grid Size 15" x 15" & of Ratio 6:1, 60 lines per inch should be provided.
4. Lead Glass and Fluroscopic Screen of Size 14" x 14" should be provided.
5. Motorised Bucky should consist of a Grid of size $17^{1/4}$" x $18^{7/8}$" & of Ratio 8:1, 85 Lines/inch. Grid movements (oscillations) should be motorised and CAM operated.
6. Table accessories: Stray radiation Lead Rubber Flaps, Stainless Steel Cassette Tray, Compression Band, Hand Grips and Foot Rest, Foot Steps to be provided.

D. Vertical Bucky Stand:

Vertical Bucky Stand with option of Chest Radiography without grid. It should be able to take up cassettes of different sizes up to 14"x17".

E. CR SYSTEM:

a. CR Reader with below mentioned sizes of cassettes (2 Nos. each) to be provided along with Single-plate Reader (which can retrieve images in about 60 sec for each plates) & Dry Laser Printer of Table Top Model with 500 or more DPI, 2 or more online.
b. CR System should be DICOM enabled.
c. Through put should be 65 plates/ hr or better for 14" x 17".
d. Following Cassette Sizes to be provided with the system:
   i) 8" x 10' – 2 Nos.
   ii) 10" X 12" – 2 Nos.
   iii) 14" x 17" – 2 Nos.
e. Manufacturer should be US FDA & European CE Certified/Approved.
f. Warrantte for 2 years with 3 years CMC should also be quoted. The cost of above mentioned cassetes shall be forzen for 3 years & should also be quoted separately so that the end user may purchase the same at a later date as per their requirement.
g. Warrantee Certification/confirmation must also be given by the Principal Manufacturer.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE/ US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable.
2. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
3. The Bidder is required to carry out minor modification in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
4. The company shall construct the protection chamber with 100 cm x 120 cm Lead Glass Window of 2mm thick lead equivalent or provide Stand Alone Radiation Protection Shield for all Radiological Equipments, wherever applicable/needed.
5. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.
6. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.

7. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

38) 1000 mA X-Ray Fluoroscopy Unit with Table & IITV

The unit should be completely integrated system (integrated X ray generator and image acquisition control console) having the following specifications:-

1. Generator

- 1000 MA unit with microprocessor controlled high frequency X-Ray generator with power output of 80 KW.
- Specify KV and mA range.
- Specify exposure time range.
- KV range 40 KV – 150 KV or more.
- Output should be 1000 mA or more at 80 KV & 800 mA or more at 100 KV.
- It should have digital display of KV & mAs.
- It should have over loading protection.
- For trauma patients, the generator should have minimum exposure time of 1 ms.
- There should be provision for automatic exposure control.

2. X-Ray Tube

- Dual focus Rotating Anode X-Ray tube having focal spot of 0.6 & 1.2 mm. or better capable of delivering 80kW output.
- Anode rotation speed should 9000RPM minimum.
- Anode heat storage capacity of tube should be 300KHU or more.
- One No. Motorized Collimators with IRIS and soft shutters should be provided.

3. Table:

Remote controlled tilting table should have 2 separate control panels by which it can be operated from inside as well as outside of intervention room.

R/F table should comprising following features:

- Motorized Height Adjustment
- Remote controlled R/F (Radio/Fluoro) Table should have soft start and stop.
- It should have remotely operated compression device with safety feature.
- Foot rest with multiple position on both ends.
- Electromagnetic locks should be available for safety.
- Patient weight carrying capacity is 200Kg.
- Table should have below movements:
- Motorized Table tilt should be from +90°/-15°.
- Motorized Transversal tabletop movement should be 220mm
- Motorized movement of imaging unit in longitudinal axis should be 7400mm.
- Auto stop in Horizontal axis is available.
- Motorized SID 1000mm to1500mm.

4. IITV SYSTEM:

- 12" Triple field image intensifier should be in the housing suitable for front mounting and placed inside the RF Table.
- CCD Camera should be with a progressive scan sensor of 2/3" of 1K x1K Medical Grade with Motorized IRIS & ND Filter. Integrated optical system. Resolution to use the full dynamic range of CCD Camera.
- 2 Nos. 19" LCD medical grade monitors along with a trolley.

5. Operating Station

- Should have a high resolution monitor minimum **19" size (TFT/LCD)** with minimum 1024x1024 or more display matrix and antireflective front screen.
- Operating console should have facility for patient identity entry, viewing and processing images, documentation.

- Specify time for the image to appear on screen after exposure - Next exposure should be possible while processing is in progress on the operating station.

6. Image Viewing and Reporting Station and Documentation

- Should have high resolution, minimum 19"size (TFT/LCD) monitor.
- Image acquisition matrix should be of minimum 3K x 3K.
- Image display matrix should be of high resolution, minimum of 1.5 K x 1.5 K.
- High luminescence display for diagnostic image viewing.
- Post acquisition image processing, viewing, reprocessing, hard copy documentation and onward transmission should be possible.
- Should be connected to a Dry chemistry Laser Camera of at least 600 DPI for documentation.
- The camera should accept all size films up to 14"x17" size.
- Long term storage facility.

7. Image storage and Transmission

- Hard disc storage capacity should be minimum of 3000 images.
- The systems should support storage of images on compact discs/DVD.
- The system should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format.
- Easy integration and networking should be possible with any other existing/future networking including other modalities, HIS and RIS and PACS.

8. PRINTER:

Suitable Printer should be supplied with the system.

9. Accessories

- UPS for the computer with 30 minute backup.
- Image viewing and reporting station – 3 Nos. with capability to store image data for 100000 images.

a. Image composition accessory should be available to allow acquisition of whole spine & extremity images.
b. Any other accessory useful for trauma work should be mentioned.
c. The Generator & Tube should be from the same Vendor / Manufacturer.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE or US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable.
3. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
4. The Bidder is required to carry out minor modification in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
5. The company shall construct the protection chamber with 100 cm x 120 cm Lead Glass Window of 2mm thick lead equivalent or provide Stand Alone Radiation Protection Shield for all Radiological Equipments, wherever applicable/needed.
6. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation,

commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.

7. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
8. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

39) 100 mA Mobile X-Ray Unit

Requirement of Radiology & Orthopedics Department

Qty - 3 Nos (2 for Radiology Dept. + 1 for Ortho Dept.)

The Technical Specification of High Frequency Mobile X-ray Machine – 100mA are as follows:

1. X-ray unit offering 100mA output with 5 KW or more should be offered.
2. X-ray unit should be of High frequency type.
3. X-ray unit should have feather touch control panel with LED display. Control panel should be compact allowing wall mountable or fitted over the X-ray tube.
4. X-ray unit should have x-ray tube having 2.0 mm or less Focal spot for better image quality.
5. Should have Anatomical programme for small medium & large patient selection of various body parts.
6. Should offer 100mA output with 200 mAS or more. Unit should have 40 to 100KV selection.
7. Should have light beam collimator ensuring accurate positioning with clear visualization of the area of interest. Auto shut facility to ensure longer life of the collimator lamp.
8. Compact mobile stand with spring balance Arm for easy positioning & handling should be provided.
9. Braking system for easy handling.
10. Offered unit should be light weight & easy to handle.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE/ US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable.
2. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
3. The Bidder is required to carry out minor modification in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
4. The company shall provide Stand Alone Radiation Protection Shield for all Radiological Equipments, wherever applicable/needed.
5. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.

6. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
7. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

40) ULTRASONOGRAPHY EQUIPMENT - COLOURED

Technical Specifications:

A. <u>Ultrasound:</u>

The System should have the state of art technology so as to apply to a variety of diagnostic needs in general imaging, obstetrics, gynecology, urology, musculoskeletal, small parts, breast, neonatal and pediatrics applications etc. with following specifications:

1. The system should have B mode, M mode, PW Doppler, High Pulse Repetition Frequency (HPRF), Color Flow Doppler, Power Doppler with bidirectional, current technique Tissue Harmonic Imaging (THI).
2. It should be able to display combined modes like B/Spectral Doppler, B/M-mode, B/Power Doppler, B/Color Doppler and Bidirectional Doppler and B/4 D mode.
3. The system should have fully digital technology with minimum 20000 digital processing channels per image frame for simultaneous formation, acquisition and display processing of multiple ultrasound beams and support dynamic focal length tuning.
4. It should have minimum three active port plus one parking port.
5. A display of 17" high resolution TFT/LCD Flat Panel Screen with swivel and tilt facility. It should also have a touch panel on the console for ease of operation of minimum 7".
6. Inbuilt image storage facility with not less than 320 GB HDD and DVD Writer facility. The image management must enable to rework on the volume files that are stored in the HDD.
7. Integrated DICOM interface, peripheral bay for B&W, Color and S-VHS.
8. The system should have dynamic range not less than 200 Db or better.
9. Intelligent Automatic Image Optimization function in B mode and Doppler.
10. Transmission focus must be freely selectable in 1 to 5 focal zones and adjustable in minimum 6 different positions.
11. Maximum zoom (read + write) upto 10 times.
12. Extended Field of view (Panaromic Imaging) with distance mesurments on actual imaging.
13. The system should have cine loop in the single/dual and quad formats upto 4000 or better frames in B-mode and atleast 50 seconds of flopper and M mode data.
14. The system pulsed wave doppler should have Pulse Repetition Frequency (PRF) minimum 0.5 to 12 khz transmission frequency from 2 to 15 Mhz with automatic doppler tracing and measurements.
15. Real time spatial compounding with transmit compounding without decrease in frame rate volume.
16. Image visualization and delineations of pathology with optimized contrast resolution with real time speckle management techniques even in color, the same should be applicable able to combine seamlessly with other applicational features in the system. Should be available with all the probes and should ensure that the frame rate is maintained high.
17. The system should be capable of the best 3D/4D imaging with newer techniques based on volume acquisition for better and optimized solutions in different diagnostic situations, apart from the basic multiplannar plane imaging with measurements in MPR possible, with other basic 3D features like 3D based volume calculations etc.
18. The system should have a very good volume acquisition speed and should have the realtime 4D cineloop capable.
19. Unit should have capability of displaying upto 4 fetal growth charts.
20. All probes should have broad bandwidth with optimized application presets for better diagnostic results and have atleast 180 elements in the array.
21. System should have advanced features of 3D Static & 4 D Real time with single view facility.

22. On board archive including Preview & Pre Selection is mandatory.
23. Demo of the system must.
24. **The system must be supplied with following minimum probes:**
    a) One transvaginal probe with FOV of 180 degrees or better & 4 to 9 MHz frequency bandwidth with temperature detection technology for gynecology applications.
    b) One Convex probe for applications in abdomen, obstetrics and gynaecology with 2 to 5 MHz with separate selectable doppler frequency and harmonic frequency.
    c) One Linear array probe for applications of vascular lower and upper extremities, small parts and pediatric applications with 3 to 11 MHz with FOV of over 35 mm with steering angle of +/-20 degree in color with biopsy guide.
25. UPS with 30 minutes back of power is mandatory and to be included in the Std. Scope of Supply.
26. Safety conformance: Should meet all the standard norms & it should be ISO , CE /US FDA approved.
27. User manual: A printed operating manual in English must be supplied.
28. The supplier shall indicate the conformity of the specification point wise & also furnish additional features of the system if any clearly. Rates must be quoted for the System and accessories separately. The supplier also has to quote price of each 4D probe separately (Optional price).
29. Manufacturer should be US FDA or European CE Certified/Approved

B. CR SYSTEM:

a. CR Reader with below mentioned sizes of cassettes (2 Nos. each) to be provided along with Single-plate Reader (which can retrieve images in about 60 sec for each plates) & Dry Laser Printer of Table Top Model with 500 or more DPI, 2 or more online.
b. CR System should be DICOM enabled.
c. Through put should be 65 plates/ hr or better for 14" x 17".
d. Following Cassette Sizes to be provided with the system:
    iv) 8" x 10' – 2 Nos.
    v) 10" X 12" – 2 Nos.
    vi) 14" x 17" – 2 Nos.
e. Manufacturer should be US FDA & European CE Certified/Approved.
f. Warrantte for 2 years with 3 years CMC should also be quoted. The cost of above mentioned cassetes shall be forzen for 3 years & should also be quoted separately so that the end user may purchase the same at a later date as per their requirement.
g. Warrantee Certification/confirmation must also be given by the Principal Manufacturer.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments, if applicable (AERB NOC will not be accepted). The Equipments should have European CE and US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable, if applicable.
3. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
4. The Bidder is required to carry out minor modification in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the requirements for satisfactory working of the equipment.
5. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards

the Turnkey works.

6. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
7. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

41) ULTRASONOGRAPHY EQUIPMENT - COLOURED

Technical Specifications:

A. <u>Ultrasound:</u>

The System should have the state of art technology so as to apply to a variety of diagnostic needs in general imaging, obstetrics, gynecology, urology, musculoskeletal, small parts, breast, neonatal and pediatrics applications etc. with following specifications:

1. The system should have B mode, M mode, PW Doppler, High Pulse Repetition Frequency (HPRF), Color Flow Doppler, Power Doppler with bidirectional, current technique Tissue Harmonic Imaging (THI).
2. It should be able to display combined modes like B/Spectral Doppler, B/M-mode, B/Power Doppler, B/Color Doppler and Bidirectional Doppler and B/4 D mode.
3. The system should have fully digital technology with minimum 20000 digital processing channels per image frame for simultaneous formation, acquisition and display processing of multiple ultrasound beams and support dynamic focal length tuning.
4. It should have minimum three active port plus one parking port.
5. A display of 17" high resolution TFT/LCD Flat Panel Screen with swivel and tilt facility. It should also have a touch panel on the console for ease of operation of minimum 7".
6. Inbuilt image storage facility with not less than 320 GB HDD and DVD Writer facility. The image management must enable to rework on the volume files that are stored in the HDD.
7. Integrated DICOM interface, peripheral bay for B&W, Color and S-VHS.
8. The system should have dynamic range not less than 200 Db or better.
9. Intelligent Automatic Image Optimization function in B mode and Doppler.
10. Transmission focus must be freely selectable in 1 to 5 focal zones and adjustable in minimum 6 different positions.
11. Maximum zoom (read + write) upto 10 times.
12. Extended Field of view (Panaromic Imaging) with distance mesurments on actual imaging.
13. The system should have cine loop in the single/dual and quad formats upto 4000 or better frames in B-mode and atleast 50 seconds of flopper and M mode data.
14. The system pulsed wave doppler should have Pulse Repetition Frequency (PRF) minimum 0.5 to 12 khz transmission frequency from 2 to 15 Mhz with automatic doppler tracing and measurements.
15. Real time spatial compounding with transmit compounding without decrease in frame rate volume.
16. Image visualization and delineations of pathology with optimized contrast resolution with real time speckle management techniques even in color, the same should be applicable able to combine seamlessly with other applicational features in the system. Should be available with all the probes and should ensure that the frame rate is maintained high.
17. The system should be capable of the best 3D/4D imaging with newer techniques based on volume acquisition for better and optimized solutions in different diagnostic situations, apart from the basic multiplannar plane imaging with measurements in MPR possible, with other basic 3D features like 3D based volume calculations etc.
18. The system should have a very good volume acquisition speed and should have the realtime 4D cineloop capable.
19. Unit should have capability of displaying upto 4 fetal growth charts.
20. All probes should have broad bandwidth with optimized application presets for better diagnostic results and have atleast 180 elements in the array.

21. System should have advanced features of 3D Static & 4 D Real time with single view facility.
22. On board archive including Preview & Pre Selection is mandatory.
23. Demo of the system must.
24. **The system must be supplied with following minimum probes:**
    a) One transvaginal probe with FOV of 180 degrees or better & 4 to 9 MHz frequency bandwidth with temperature detection technology for gynecology applications.
    b) One Convex probe for applications in abdomen, obstetrics and gynaecology with 2 to 5 MHz with separate selectable doppler frequency and harmonic frequency.
    c) One Linear array probe for applications of vascular lower and upper extremities, small parts and pediatric applications with 3 to 11 MHz with FOV of over 35 mm with steering angle of +/-20 degree in color with biopsy guide.
    d) Biopsy operative probes must be provided.
25. UPS with 30 minutes back of power is mandatory and to be included in the Std. Scope of Supply.
26. Safety conformance: Should meet all the standard norms & it should be ISO , CE /US FDA approved.
27. User manual: A printed operating manual in English must be supplied.
28. The supplier shall indicate the conformity of the specification point wise & also furnish additional features of the system if any clearly. Rates must be quoted for the System and accessories separately. The supplier also has to quote price of each 4D probe separately (Optional price).
29. Manufacturer should be US FDA or European CE Certified/Approved

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments, if applicable (AERB NOC will not be accepted). The Equipments should have European CE and US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable, if applicable.

42) C – Arm Image Intensifier

Requirement of Surgery & Orthopedics Department

Qty - 3 Nos (1 for Surgery Dept. + 2 for Ortho Dept.)

Description of Function:

1. This equipment is used in orthopaedic fractures for imaging of bone pathology Orfractures on a display monitor during operation / reduction of fractures.
2. Uni-planar which is convenient, least bio/radiation-hazardous efficient for all type of orthopaedic imaging of bones preoperatively /otherwise.
3. A Versatile, compact and true counterbalanced C-arm unit should allow unobstructed Positioning and enhanced ease of operation in OT for surgical interventions.

Technical Specifications:

1. Mechanical motion requirements for C-Arm:

   i. Motorized Vertical travel: Minimum 400 mm or more.
   ii. Horizontal travel: 200 mm or better.
   iii. Rotation of C-arm: +/- 180 deg. or more.
   iv. Pivotal rotation: 12.0 deg. or more.

v. Orbital rotation: minimum 120 deg. (90 deg. to minimum 30 deg.) or better.
vi. Depth / Radius of C-arm: 650 mm or better.
vii. Free space between Image Intensifier & X-ray tube: Minimum 750 mm or more.
viii. Source to Image intensifier distance (SID): 900 mm or more.

2. The C-arm should have facility of locking the C-arm movements with easy to turn handle on control unit. Rear wheels must be freely movable for easy to turn handle on control unit. Rear wheels must be freely movable for easy positioning of the complete C-arm around the OT table.
3. Image Intensifier should have at least triple field 9"/6"/4" input diameter offering resolution (Minimum 64lp/cm or better for 4" input) and contrast ratio (25:1 or better).
4. TV Camera:
   Ultra Compact CCD camera or camera with CMOS or advanced CMOS sensor along with 2 Nos. 17" flicker free TV monitors with facility to rotate the image continuously.
5. Direct Radiography:
   Radiography should be possible on a cassette to be fitted in a holder for 10X 12 Inches cassette. The unit should be complete with one such holder and 1 No. Cassettes should including high speed intensifying screens.
6. X- ray generator:
   High frequency (20- 40 KHz or more) at least 6 KW or even better X-ray generator with high capacity rotating anode X-ray tube of dual foci of 0.3 and o.6 mm (200 KHU)or better.
7. Fluoroscopy output: 40-120 KV in IKV steps.
8. MA output: Minimum upto 8.0 mA or better.
9. Snapshot: Minimum 7.0 mA or better.
10. Pulse Fluroscopy with variable Pulse Rate.
11. Automatic dose rate regulation.
12. Time totaler for fluoroscopy with facility for alarm after every 5 minutes of fluoroscopy.
13. Radiography output: 40-120 KV in 1 KV steps.
14. mAs range: Up to 200 mAs or better.
15. mA max: Up to 60 mA or better.
16. Image Memory:
    At least 1 (LIH) + minimum 20,000 frames dynamic digital memory on Hard Disk with 1024 X 1024 matrix or better. There should be facility to insert patient name through alpha-numeric key board. The system preferably must be upgradable for performing real time digital subtraction angiography with acquisition upto 6 frames/sec. or better and road mapping functions etc. at any later date for peripheral angiography.
17. Image processing:
    The system should have automatic dose level selection. It should preferably have automatic image parameter selection with capability of Switching on to manual selection. Image storage of 20,000 images on a 1024 / 1024 matrix It should have image annotation facility; measuring of distances and angles, entering of demographic data of patients, support of DICOM 3.0 functions. Image processing must be a fully digital continuous chain of at least 1k / 1k matrix for image acquisition, processing, storage, archiving and documentation. **The system should allow configuration and linking up with the HIS (Hospital information system).**
18. Essential Accessories: The complete functional system must be quoted with dual channel Laser light source onX-ray tube unit for making a cross to reduce the X-ray dose, built in dose area productmeter for display of X-ray dose, **AERB approved Light weight lead free aprons (7)**, **thyroid shields (5**), **gonadalshields (5), lead goggles (3)** and preferably a CVT and thermal printer with 12 film rolls and a CD/DVD writer.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE **and** US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable, wherever applicable.
3. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and

installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.

4. The Bidder is required to carry out turnkey works in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
5. The company shall construct the protection chamber with 100 cm x 120 cm Lead Glass Window of 2mm thick lead equivalent for the Radiological Equipments, wherever applicable/needed.
6. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Civil Works, Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.
7. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
8. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

43) CT SCAN – 64 Slice

The system should be latest state of the art, independent 64 or more rows of detectors with acquisition of at least 64 slices per rotation capable of integrating with any PACS/HIS system. The system should be **DICOM – enabled / ready** with true isotropic volume acquisition and sub millimeter resolution. The model quoted should be, AERB Type approved and US FDA and European CE certified. The essential requirements of the system are as follows:-

a) Gantry:
- Aperture: 70 cms or more
- FOV: 50 cms or more
- 3-D laser lights for positioning.

b) X-Ray Generator:
- High Frequency type.
- Power output: 80 kW or higher
- mA Range: 20-600 mA (With incremental steps of 10 mA)
- KV Range: 80-110 or more

c) X-Ray Tube:
- Tube Voltage: 80-110 kV or more
- Anode Heat Storage Capacity of at least 8.0 MHU or direct cooling tube

d) Patient Table:
- Load carrying capacity at least of 180 Kg with positional accuracy of 1 mm or less
- Metal free scan-able range of 150 cm or more.
- Floating table top with foot pedal/hand control for positioning.

e) Spiral Acquisition:
- Scan Time should be 0.4 sec or less for full 360 degree rotation.
- Minimum slice thickness should be 0.625 mm or less.
- Pitch Factor (volume pitch): freely selectable in auto mode and also manually variable between 0.5 to 1.5 or more. Specify all possible pitch selections.
- Bolus Triggered or bolus chase spiral acquisition should be available.
- Real time x-ray dose reduction which combines both Z axis and angular tube current modulation to adjust the dose to the size and shape of individual.

f) Image Resolution:

1. High contrast resolution should be at least 15 lp/cm for axial and spiral scan at 0% MTF with full FOV.
2. Low contrast resolution – 5mm or less at 3.0 HU using 20 cm CATPHAN phantom on 10 mm slice thickness.

g) Data Acquisition System:

- Detector- Capable of acquiring 64 slices per 360 degree of rotation.
- At least 64 rows of independent detectors are required with Z-axis coverage of 38 mm or more.
- Solid state or rare earth detectors of latest technology free from repeated calibration.

h) Image Reconstruction:

- High speed real time reconstruction with display matrix of 1024x1024 or more.
- Reconstructed slice thickness should be sub-millimeter to 10mm freely selectable.

i) Operator Console:

- High resolution medical grade LCD color monitors of 19‖ or more.
- Should perform Registration, scheduling, protocol selection, Volume rendering, volume measurements, Multi-planar Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation.
- Raw Data storage with at least 500 GB Hard disc having image storing capacity of 5,00,000 or more in 512x512 format.
- Auto-voice capability with custom designed key board and mouse.
- Archiving options: CD-R, DVD, should be available. 5000 rewritable DVDs should be provided.

j) Workstation client server architecture)

1. It should be a high speed (minimum post-processing frame rate of 16 frames/sec) CPU with a speed of 3.0 GHz or better and with an independent Hard disc storage capacity of 512 GB or more, with 19 inches or more high resolution medical grade colour LCD monitors capable of simultaneously viewing and performing all post processing functions and filming independently without the help of main console.
2. Memory of the workstation should be independent of the console.
3. Two way data transfer between the operator console & the satellite workstation should be automatic and standard.
4. Post Processing Soft-wares

    (i) Perfusion CT for brain
    (ii) CT Angio, VRT, MIP, MPR, 3-D Shaded Surface display, Image Fusion,Vessel segmentation, luminal view.
    (iii) Virtual Endoscopy with facility for virtual dissection and computer aided detection of polyps.
    (iv) Advanced cardiac package including Coronary Artery Imaging, Calcium Scoring, Myocardial Viability software, Cardiac functional analysis and advanced Vessel. Analysis including stenosis assessment. Facility for prospective and retrospective ECG gating, facility for automatic selection of rotation speed according to heart beat and step and shoot for low dose acquisition should be available.
    (v) Automatic bone Removal facility.
    (vi) Dental CT.
    (vii) Lung nodule evaluation software. CAD for Lung nodule evaluation software should also be provided.
    (viii) Liver segmentation display software in different colours, volumetry and virtual surgical plane identification.
    (ix) Bone Mineral Densitometry software.
5. Interactive & Automatic Cine display should be available.
6. Image Evaluation Tools:
    (i) Parallel evaluation of multiple ROI in circle, irregular and Polygonal forms,
    (ii) Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.
    (iii) Distance & angle measurement, freely selectable, positioning of co-ordinate system, grid and image annotation.
7. One similar independent post processing stations (workstations, total no.2) with all the software as in the main console should be available. . The necessary connectivity etc. for proper functioning should be provided by the vendor with the supply of stand alone server of atleast 10 tera byte storage capacity with expansion slot of additional tera bytes. All post processing facility and data archiving should be available independently at both the workstations.

k) Patient communication system:

1. An integrated intercom and Automated Patient Instruction System (API) should be provided.
2. Two closed circuit TV for patient monitoring.

l) Dry Chemistry Laser Imager:

1. Resolution: 16 bits/ **500** dpi or more with minimum three ports.
2. Support Multiple Film Sizes: one of which must be 17″x14″.
3. DICOM 3.0 Compatible.

m) System Configuration Accessories, spares and consumables:

- Collapsible wheel chair with rubberized swivel wheels - 01 nos.
- Standard Patient positioning accessories and restraining devices - 02 sets.
- Gonadal shields – 5 Nos, Thyroid shields – 5 Nos and Lead goggles – 5 Nos.
- Lead Glass 100 cm x 150 cm of 2 mm Lead equivalence as per the requirement of the equipment, as per AERB guideline / recommendations.
- Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, with at least 30 minutes back up.
- Dual Head Pressure Injector with 5000 syringes of 200 ml.
- Software for Remote Diagnostics Service should be provided.
- System must be PACS, HIS/RIS interface ready without any new hardware or software.
- Centralized oxygen and suction facility (to be connected to the nearest port) in gantry and recovery room.
- A free comprehensive software upgrade guarantee for entire life of scanner must be provided.
- **Real time CT Fluoroscopy** with at least 6 to 8 frames per second with dedicated 15" color LCD monitor. Facility table side controls and foot switch for biopsy to be quoted separately.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE **and** US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable, wherever applicable.
3. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
4. The Bidder is required to carry out turnkey works in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
5. The company shall construct the protection chamber with 100 cm x 150 cm Lead Glass Window of 2mm thick lead equivalent for the Radiological Equipments, wherever applicable/needed.
6. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Civil Works, Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.
7. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of

Turnkey.

8. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

44) MAMOGRAPHY MACHINE WITH CR SYSTEM

Generator:

a) Microprocessor controlled High Frequency generator with integrated beam filters to reduce patient skin radiation dose
b) Minimum generator output: 5 KW or more

X ray Tube:

Rotating Anode X-Ray tube
KV: 23 KV to 35 KV, adjustment in increment of 1 KV
mAs capacity - 1 mAs to 500 mAs or more
Focal Spots: Dual focal spots of 0.3 mm and 0.1 mm or better
Anode Heat Storage capacity: 200 KHU or more

Gantry/ X – Ray Stand:

Motorized height adjustable to at least 75 cm to 125 cm or more above the floor to object table
Should have large swivel range: -180 deg to + 135 deg or more. Rotation should be iso-centric
Automatic collimation to film format
Grid:R 5:1, 30 lines/ cm or more
Combination filter Mo/Mo and Mo/Rh and the lower dose according to individual breast
Automatic Exposure Control with compensation Compression device: Both motorized and manual Exposure Modes:
Dual mode - Automatic & manual Magnification device:
Metallic magnification device with a magnification factor of 1.5 to 2 or better
Bucky unit: 18X24 cm & 24 X 30 cm.
The CR cassettes compatible with CR should be supplied. System must have AERB type approval
The unit should have European CE certificate / US FDA

1. Suitable Radiation shield
2. Rotating stool for patient
3. Suitable online UPS with at least 30 min back up.
4. Unit should be upgradable to Stereotactic Biospy.

CR SYSTEM

a. CR Reader with below mentioned sizes of cassettes (2 Nos. each) to be provided along with Single-plate Reader (which can retrieve images in about 60 sec for each plates) & Dry Laser Printer of Table Top Model with 500 or more DPI, 2 or more online.
b. CR System should be DICOM enabled.
c. Through put should be 65 plates/ hr or better for 14" x 17".
d. Following **FDA Approved Mammography Cassette Sizes** to be provided with the system:
   i) 8" x 10' – 4 Nos.
   ii) 10" X 12" – 4 Nos.
e. Following Cassette Sizes to be provided with the system:
   i) 8" x 10' – 2 Nos.
   ii) 10" X 12" – 2 Nos.
   iii) 14" x 17" – 2 Nos.
f. System should be able to perform 20 pixel/mm for mamography also.
g. Manufacturer should be US FDA & European CE Certified/Approved.
h. Warrantte for 2 years with 3 years CMC should also be quoted. The cost of above mentioned cassetes shall be forzen for 3 years & should also be quoted separately so that the end user may purchase the same at a later date as per their requirement.
i. Warrantee Certification/confirmation must also be given by the Principal Manufacturer.

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE **and** US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable, wherever applicable.
3. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
4. The Bidder is required to carry out turnkey works in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
5. The company shall construct the protection chamber with 100 cm x 120 cm Lead Glass Window of 2mm thick lead equivalent or provide Stand Alone Radiation Protection Shield for all Radiological Equipments, wherever applicable/needed.
6. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Civil Works, Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.
7. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
8. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

45) MRI - 1.5 Tesla

Competitive bids are invited for installation of **1.5 Tesla** MRI System with state-of-the-art latest features commercially available at the time of supply **European CE and US FDA approved).** The system must be capable of integrating with any PACS/HIS system. The system should be **DICOM – enabled / ready** with true isotropic volume acquisition and sub millimeter resolution. The system should be cost effective, with user friendly platform, reliable and capable of providing excellent performance for clinical imaging and research. The detailed specification that follows shall be understood to be minimum requirement.

1. MAGNET

a. Whole Body **1.5Tesla** Magnetic Resonance Imaging System optimized for higher performance in Whole Body and Vascular examinations with superconducting magnet, high performance gradients and digital Radio Frequency System.
b. **1.5T** active shielded super conductive magnet should be short and non-claustrophobic.
c. It should have at least 70 cm patient bore with flared opening.
d. Magnet length should be less than 200cm.
e. Homogeneity of magnet should be less than 3.5 ppm over 45cm DSV
f. The magnet should be well ventilated and illuminated with built in 2 way intercom for communication with patient.
g. It should have a built in cryo-cooler such that helium consumption does not exceed 0.03 lit/ hour.

2. SHIM SYSTEM

a. High performance, highly stable shim system with global and localized automated shimming for high homogeneity magnetic field for imaging and spectroscopy.
b. Auto shim should be available to shim the magnet with patient in position.

3. GRADIENT SYSTEM

a. Actively shielded Gradient system
b. The gradient should be actively shielded with each axis having independently a slew rate of at least 200 T/m/s and a peak amplitude of 33 mT/m.
c. The system should have efficient and adequate Eddy current compensation
d. Effective cooling system for gradient coil and power supply

4. RF SYSTEM

a. A fully digital RF system capable of transmitting power of at least 15kw.
b. It should also have at least 16 independent RF receiver channels with each having bandwidth of 1 MHz or more along with necessary hardware to support quadrature ICP array/Matrix coils. The highest receiver channels available with the vendor should be quoted.
c. It should support Parallel acquisition techniques with a factor of up to 2 in 2D.
d. Should allow remote selection of coils and / or coil elements.

5. PATIENT TABLE

a. The table should be fully motorized, computer controlled table movements in vertical and horizontal directions.
b. A CCTV system with colour LCD display to observe the patient should be provided: Moving table angiography should be possible.
c. There should be a hand held alarm for patients

6. COMPUTER SYSTEM /IMAGE PROCESSOR / OPERATOR CONSOLE

a. The main Host computer should have a 19 inches or more high resolution LCD TFT color monitor with 1024 x 1024 matrix display
b. The system should have image storage capacity of 100 GB for at least 2,00,000 images in 256x256 matrix.
c. The reconstruction speed should be at least 1300 or more for full FOV 256 matrix.
d. The main console should have facility for music system for patient in the magnet room. The system should have DVD / CD / flash drive archiving facility. Supply 5000 DVD along with the system. The system should be provided with auto DVD writer.
e. Two way intercom system for patient communication.
f. MRI System should be enabled and networked to RIS/HIS

7. MEASUREMENT SYSTEM

a. Largest Field of View should be at least 45 cm in all three axis.
b. The measurement matrix should be from 128x128 to 1024x1024.
c. Minimum 2D slice thickness mm should be equal to or less than 0.5
d. Minimum 3D slice thickness mm should be equal to or less than 0.1

8. COIL SYSTEM

a. The main body coil integrated to the magnet must be Quadrature / CP. In addition to this following coils should be quoted (total **11** including body coil)
b. Multichannel Head coils with at least 8 channel for high resolution brain imaging. (16 channel coil should be supplier whenever available to the vendor with no additional cost.)
c. Neuro-vascular Coil with 16 or more channels or Head / Neck Coil combined, capable of high resolution neuro-vascular imaging
d. Spine Array/Matrix Coils for thoracic and lumbar spine imaging.
e. Body Array/Matrix coil with at least 45 cm z axis coverage for imaging of abdomen (so that it can

cover the maximum part of abdomen), angiograms and heart. (The best available body coil with the vendor must be supplied)

f. Dedicated Cardiac Coil.
g. Suitable coil for peripheral angiography application
h. Bilateral Breast Coil with at least 7 channels. The best available coil with vendor should be supplied.
i. Dedicated Shoulder Coil – 8 Channels.
j. Dedicated Knee Coil – 8 Channels.
k. Breast Coils.
l. General purpose flexible coils and circular coils
m. Loop Flex Coil
n. Coil Storage Cart
o. The system should continuously monitor the RF coils used during scanning to detect failure modes. RF coils should not require either set up time or coil tuning; Multi coil connection for up to 2 or more coils for multaneous scanning without patient repositioning coil combination should be quoted as standard.

9. APPLICATION SEQUENCES

a. The system should have basic sequences package with Spin Echo, Inversion Recovery, Turbo Spin Echo with high turbo factor of 256 or more, Gradient Echo with ETL of 255 or more, FLAIR.
i. Single slice, multiple single slice, multiple slice, multiple stacks, radial stacks and 3D acquisitions for all applications.
ii. Single and Multi shot EPI imaging techniques with ETL factor of 255 or more
iii. Fat suppression for high quality images both STIR and SPIR.
iv. The system should acquire motion artifact free images in T2 studies of brain in restless patients (Propeller, Multivane, Blade etc)
v. Dynamic study for pre and post contrast scans and time intensity studies
vi. MR angio Imaging: Should have 2D/3D TOF, 2D/3D PC, MTS and TONE, ceMRA, Facilities for Accelerated time resolved vascular imaging with applications like Treats/Tracks/Tricks sequences.
vii. Fat and water excitation package. Diffusion Weighted Imaging, with at least b value of 5000 or more.
i. Bolus chasing with automatic and manual triggering from fluro mode to 3D acquisition mode with moving table facility.
j. Non contrast enhanced peripheral angiography for arterial flow with Native/Trance/lnhance sequences
k. Whole body screening imaging studies for metastasis
I. High resolution Abdominal and Liver imaging in breathold and free breathing modes with respirator triggered volume acquisitions
m. The system should have basic and advanced MRCP packages including free breathing and 3D techniques.
n. The system should have facility for flow quantification of CSF, vessel flow and hepatobiliary system.
p. The system should have the Hydrogen, Single Voxel spectroscopy, Multivoxel, Multislice & Multiangle 2D, 3D Spectroscopy and Chemical shift imaging in 2D/3D. The complete processing/post-processing software including color metabolite maps should be available on main console. Complete prostate spectroscopy hardware and applications should be provided.
q. Advanced Cardiac Applications:**.** VCG gating, Morphology/wall motion; Cine perfusion imaging; Myocardial viability imaging; Arrhythmia rejection techniques, Advanced Cardiac Ventricular Measurement Analysis; Cine Cardiac Tagging Techniques; Coronary artery techniques; real time interactive imaging, 2D/3D fast field echo/balanced/steady state techniques and evaluation package on workstation
r. Advanced Breast imaging Package.
s. Perfusion imaging of brain (including ASL)
t. Susceptibility weighted imaging (i.e.SWI)/ Venous BOLD imaging.
u. Multi Direction DWl and DTI with minimum of 32 directions (Complete package including quantification and tractography software). Prospective motion correction enabled software preferred.
v. High resolution imaging for inner ear

10. WORK STATION – 2 Nos.

i. A workstation with preferably the same user interface as of main console is required with the availability of all necessary software including Client source based Architecture.
ii. Basic post-processing software including MIP, MPR, surface reconstruction and volume rendering technique.
iii. Advanced post-processing offered applications perfusion quantification, advanced diffusion and DTI, processing of 2D/3D CSI data, with color metabolite mapping, quantification of CSF flow data, vascular analysis package.
iv. It should have at least 19 inch LCD TFT color monitor, with hard disk of at least 120 GB for at least 250,000 image storage in 256 matrix, and 4 GB RAM capacity or more, with self-playing OVO/CO archiving facility.
v. The workstation should display cardiac cine images in movie mode with rapid avi creation.
vi. The workstation should enable printing in laser film camera and color printers

11. SAFETY FEATURES

The System should have following safety features:

a. The magnet system should include an Emergency Ramp Down unit (ERDU) for fast reduction of the magnetic field with Ramp Down time below 3 minutes
b. The magnet should have .quench bands that contain the fringe fields to a specified value in the event of a magnet quench
c. Real time SAR calculation should be performed by software to ensure that RF power levels comply with regulatory guidelines and are displayed on each image
d. The system shall have manual override of the motor drive for quick removal of the patients from the magnet bore
e. Temperature sensor (built in) for magnet refrigeration efficiency must be provided.

12. DOCUMENTATION

a. DICOM compatible Dry Chemistry laser camera with integrated processor for filming from main console & workstation.
b. Printing on films of 14" x 17",11" x 14" and 10" x 8" sizes in a resolution of 500 or more dpi. It should be possible to connect other imaging modalities to the printer**.** 5000 compatible films to be provided.

13. UPS

The system should be provided with UPS system for the complete system with at least 30 minute back up.

14. SUITABLE RF ENCLOSURE

a. RF Cabin: The system should be supplied with the imported RF cabin with RF room shielding, RF Door screen, and interiors for the same should be carried out suitably.

15. ACCESSORIES

i. Dual Head MRI Compatible Pressure Injector of International make with 100 sets of syringes.
ii. Water Chiller for Cold Head I Gradients.
iii. One Non-ferromagnetic patient transfer trolley of international make should be provided.
iv. Fire Fighting System, Detectors and 6 Fire Extinguishers.
v. Hand held metal detectors and Stand alone Metal Detector to be installed at the entrance point.
vi. Closed circuit CCD camera.
vii. Phantoms for image quality audits.
viii. MRI compatible Anaesthesia machine – detailed specification given below, **to be quoted as optional Item**.
ix. Suction and O_2 pipeline and manifold to be provided inside the RF enclosure.

16. GUARANTEE

a. The vendor should guarantee the service and spare support for 10 Years of the system including Helium and cold head and all accessories after warranty.
b. Application training to be provided onsite for total of FOUR weeks.

c. Two Radiologists to be provided training at premier govt. teaching institute within country for two weeks.

17. Warranty and CMC:

All tender responses should include the following without which the tender will be considered invalid

- The system should have warranty for two years including helium refill, all accessories and turnkey work. Helium Refill shall be the responsibility of the Bidder throughout the Warrantee Period & also during the CMC tenure.
- Comprehensive Maintenance Contract (CMC) for the whole equipment including helium refill and all accessories including turnkey for Eight years should be quoted after warranty.
- **The Warrantee & CMC shall be for all items for which the order shall be placed including Third Party Items. Repair Maintenance shall be executed through the Main Vendor / Bidder**.
- The model with 'the best and latest technical features available with the vendor should be quoted in tender response with original printed vendor data sheets.
- All product catalogues including Detailed Technical Data Sheet in original must be provided.
- A soft copy in word format in addition to a hard copy to be provided in a CD.
- When the vendor data sheet disagrees with the bid response, clarification should accompany in the form of letter/certificates from the principals in original.
- The System should be DICOM – 3MPPS enabled & should be ready to integrate with any existing PACS/HIS System.
- List of all installations of the system in the country.
- The bidder must provide Compliance Statement indicating all Tendered Specifications & must corroborated in the compliance statement the page number where it is listed in the original technical data sheet along with soft copy of the same.
- Turnkey work detail & other details are provided separately.

Technical Specifications for MRI Compatible Various Machines

(TO BE QUOTED AS OPTIONAL ITEM FOR I & II BELOW)

II. **Specifications for Anesthesia Machine:**

1. All the components of anesthesia machine including anesthesia ventilator, anesthesia monitor and accessories should be MRI compatible
2. The Machine should have separate indexed (pin index/ DISS/NIST) provision for connecting central pipeline gas supply of oxygen, air and nitrous oxide. It should have mounting capability of two oxygen and two nitrous oxide pin-indexed gas cylinders.
3. High pressure tubing for Oxygen, air and Nitrous Oxide for central supply connection with pipeline connectors should be supplied with machine.
4. There should be pressure indicating gauges for each gas for both cylinder as well as pipeline supply in accordance to ISO requirements.
5. **Gas Flow Management:**
   a. Mechanical colour and touch coded flow meters: precisely calibrated cascaded tube flow meters for oxygen down the stream.
   b. Mechanical hypoxic guard to ensure minimum concentration of 25% oxygen, across all oxygen nitrous oxide mixtures and oxygen failure alarm along with nitrous oxide cut off conforming to ISO requirements.
   c. Machine should be able to deliver maximal flows for oxygen and nitrous oxide at least up to 8 liters per minute through flow meters.
   d. Emergency oxygen flush that can deliver flows between 35 to 50 liters per minute. It should be protected from accidental activation as per ISO requirements.
6. **Vaporisers:**
   a. Vaporiser shall mount to a selectatee manifold of at least two vaporizers, which allows easy exchange between agents.

b. Vaporizer must be isolated from the gas flow in the off position and prevent the simultaneous activation of more than one vaporizer.
c. With each working station temperature, pressure and flow compensated anaesthetic agent specific vaporizers for Isoflurance and sevoflurane should be provided. Vaporizers should be quick loading / unloading type.

7. **Breathing system:**
   a. Closed circle system with carbon dioxide absorbent canisters should be part of machine. There should be common gas outlet for using other type of breathing system with this machine. Breathing system shall be fully autoclavable to 134ºC and natural latex free. Long coaxial breathing system tubings to meet the requirement of MRI suit.
   b. Facility of connecting to scavenging system.

8. Anesthesia machine should be mounted on flour large antistatic castor wheels with foot brake/ locking facility for at least front two wheels.
9. There should be work surface and drawers with at least one drawer with locking facility.

III. **Specifications for Anesthesia Ventilator:**

1. The anesthesia machine should have integrated Anesthesia Ventilator system that should have at least CMV or A/CMV mode with adjustable breath rate, tidal volume and I:E ratio.
2. Ventilator bellows should be integrally mounted to the breathing system and ascending type. Bellow assembly should be autoclavable.
3. Anesthesia ventilator should have following adjustable parameters: (The range mentioned below in adjustable parameters is minimal desirable and wider range than this will be preferred)

   i. Tidal volume range 50ml to 1200ml
   ii. Respiratory rate range 4 to 30 breath per minute
   iii. I:E ratio range 1:1 to 1:3
   iv. Inspired airway pressure range 15 to 60cm of water.

4. Anesthesia ventilator should have audiovisual alarms with temporary muting facility for power failure, breathing system disconnection, high inspiratory airway pressure

(TO BE QUOTED AS ESSENTIAL ITEMS ALONG WITH THE SYSTEM FOR III, IV & V BELOW)

III. **Specifications for MRI Compatible Multi Parameter Monitor:**

1. The anesthesia machine should have integrated / mounted monitoring system with memory to monitor patient parameters:
2. Five lead ECG with arrhythmia detection facility.
3. Respiratory rate measurement by impendence method.
4. SPO2 measurement with plethysmograph and saturation dependent audio tone.
5. NIBP measurement.
6. Temperature measurement.
7. It should have provision for automatic identification and measurement of anesthetic agents (Sevoflurance, isoflurane) and EtCO2

IV. **Essential Accessories**

Each anesthesia machine should be supplied with complete MRI compatible accessories and spares to make its all functions operational.

1. Long coaxial circle system tubings 1 set to suit MRI suit, 2L reservoir bag 1, brains breathing system

2. At least three ECG cables with MRI compatible body electrodes
3. SPO2 cable and sensor adult 1 paediatric 1
4. Temperature probe nasopharyngeal 1, skin 1
5. EtCO2 and anesthesia gas sampling lines 2
6. NIBP tubing and cuff adult range 1, medium 1, paediatric 1

V. **Others**

1. The Monitor should have at least 30 min battery backup.
2. Laryngoscope – adult and pediatric compatible with MRI 1.5 T (2Nos.).

NOTE:

Unless other mentioned elsewhere in the Technical Specifications, the bidder has to comply with the following:

1. The quoted Equipment should be **DICOM 3.0 (or higher version) enabled / ready** (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format and capable of being interfaced with HIS/RIS/PACS.
2. The quoted Equipment should have AERB Type Approval of the Manufacturer for Radiological Equipments (AERB NOC will not be accepted). The Equipments should have European CE **and** US FDA certification. Manufacturing firm should be ISO approved. Vendors shall assist the Consignee in getting AERB Site Plan approval prior to installation, wherever applicable, wherever applicable.
3. The Bidders are advised to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards.
4. The Bidder is required to carry out turnkey works in terms of Civil (including trenches, railing etc, if required), Mechanical (including HVAC, if required) & Electrical to meet the AERB requirements for satisfactory working of the equipment.
5. The company shall construct the protection chamber with 100 cm x 120 cm Lead Glass Window of 2mm thick lead equivalent for the Radiological Equipments, wherever applicable/needed.
6. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Civil Works, Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.
7. The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.
8. "Special Compliance Note" at the end of the Technical Specifications may please be read in continuation with the above into while quoting.

SPECIAL COMPLIANCE NOTE (For Radiology Equipments):

Unless other mentioned elsewhere in the Technical Specifications, Tender Document, Notes (mentioned against each Equipment), the bidder has to comply with the following, however, it is the responsibility of the bidders to visit the consignee site for assessing site requirements and its readiness:

A. DICOM enabled:

All Digital Imaging Equipments (1000 mA X-Ray, Ultrasound, CT Scan, MRI, C-Arm with IITV, Mammography etc) should be **DICOM enabled / ready** and capable of being interfaced with HIS/RIS/PACS.

B. Essential Accessories:

Unless otherwise mentioned, the following essential accessories to be provided with the units:

i. Servo Voltage stabilizer of suitable Capacity with spike suppressor. The make & rating of the voltage stabilizer should be specified.
ii. Lateral cassette holder, wherever applicable – One.
iii. Five Nos. AERB approved Light Weight Lead-free Aprons with each Radiological Equipments to be quoted & provided.
iv. Two nos Slim LED based Film View Box of four panel, for viewing 14" x 17" Films, to be quoted with each machine.

C. Warrantee:

i. Warranty of 24 months from the date of Installation, of the equipments including all parts for which the order has been placed as well as accessories and auxiliary units supplied with the main equipment including x – ray tube & other accessories.
ii. 95% uptime guarantee should be given. In case down time exceeds 5%, penalty in the form of extended warrantee, double the number of days for which the equipment goes out of service, will be applied.
iii. The vendor must maintain a Logbook & needs to be countersigned by HOD/Authorized Departmental Person while attending the Equipments.

D. C. M. C.:

C.M.C. for 5 years (8 years in case of CT Scan & MRI) for whole equipment including labour cost, spare cost, accessories supplied with the unit like A.C. etc. and x-ray tube.

E. APPROVALS:

The quoted Equipment Model must be registered with AERB. The offered unit should have AERB Type Approval of the Manufacturer & NOC from AERB will not be accepted for any Radiological Equipments. All Radiological Equipments should have IEC/European CE/ US FDA for radiation protection, however, for 1000 mA X-Ray Machine, Ultrasound, CT Scan, Mamography, MRI & C-Arm with IITV, the unit must have both Europe CE **and** US FDA Approval. Manufacturing firm should be ISO approved. Vendors shall be responsible for getting AERB Site Plan approval prior to installation, wherever applicable. The documentary evidence for the above must be attached. The bidder shall assist the end user in obtaining the Radiation Equipment registered with AERB.

F. Third Party Inspection:

The firm should get the **third party inspection** done before dispatch of the equipment at its own cost, certifying that the equipment is brand new and as per NIT/specifications

G. QA Test Report:

i. The company should provide lay out plan and QA Test Report for Registration in AERB, as per Law of the Land.
ii. Vendor must perform QA Tests, every quarter of the year, on the Equipments during Warrantee & CMC Periods & quote accordingly. They must keep/maintain record for the same.

H. Turnkey Work:

Bidders are requested to visit the Site to assess the site condition of Equipment placement and installation before quoting & obtain all necessary details as no representation shall be entertained on later date / after submission of quotation onwards. Bidders must take into consideration in its bid costs to be incurred for any additional work viz. Electrical cabling of suitable ratings, Electrical points of suitable ratings, water connection, water drainage, plumbing & allied requirements for the equipment etc. required for successful installation, commissioning and running of the Equipment and the "All inclusive lump sum price" should include all such costs. The Firm is required to provide / quote for both breakup cost & Total Lump sum cost towards the Turnkey works.

The company shall construct the protection chamber with 100 cm x 150 cm Lead Glass Window of 2mm thick lead equivalent, wherever applicable.

The Department shall provide only three phase power supply along with Air-conditioning Ducting outlets with de-humidifying system at a suitable position in the concerned installation area. The rest of the work will be done by the firm on "**Turnkey Basis**" including rails for floor to ceiling column stand etc., if required etc. Earthing to be provided by the employer as per the requirement of the firm & this should be mentioned in the bid. Minimum necessary furniture and fire extinguisher system need to be part of Turnkey.

I. Instructions to the vendors/suppliers:

All companies must give product data sheets confirming the specifications along with the tender. ***The compliance statement must be filled strictly in a tabulated and point wise manner clearly mentioning the page / paragraph number of original catalogue / datasheet any point***. Each specification corroborated in the compliance statement must give the page number where it is listed in the product data sheet. Incompletely filled information will not be considered.

J. Standards, safety and training:

1. The unit shall be capable of being stored continuously in ambient temperature of 0 -50 deg. C and relative humidity of 15-90%.
2. The unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of less than 70%.
3. Comprehensive training for lab staff and support services till familiarity with the system.
4. User/Technical/Maintenance manuals to be supplied in English.
5. Certificate of calibration and inspection.
6. List of Equipments available for providing calibration and routine maintenance support as per manufacturer documentation in service / technical manual.
7. List of important spare parts and accessories with their part number and costing.
8. Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist.
9. The job description of the hospital technician and company service engineer should be clearly spelt out.

46) Adult Dummy

Adult Dummy for Teaching purpose for Medical Students.

47) Pediatric Dummy

Pediatric Dummy for Teaching purpose for Medical Students.

48) Defibrillator with recorder and Monitor

1. The defibrillator should be least, lightweight, small size with bright colored display.
2. The defibrillator should be Biphasic waveform with 3 wave form display with screen size minimum 6 inches diagonal.
3. It should display of both selected and delivered energy.
4. It should have ability to energy selection from Paddles as well as unit.
5. In manual mode the unit should provide energy selection at (1-10, 15, 20, 30, 50,70,85,100,150,200) joules.
6. It should have ability to measure chest compression rate and depth in real time with both visual & audible feedback and optional CPR index on screen.
7. The unit should have transcutaneous external pacing with 40 milli-second pulse width.
8. The unit should do self test daily with facility to give print out of defibrillator testing report and also have code ready indicator on unit.
9. It should have ability to filter out CPR artifacts and allowing person to see organized rhythms without interrupting chest compression.
10. The defibrillator should have facility to monitor following parameters.
    a. SpO_2
    b. $EtCO_2$
    c. NIBP
    d. ECG
11. Should have optional capability of internal defibrillation if and when required.
12. The Unit should be U.S.F.D.A approved

In addition to standard accessories following items have to be supplied with unit

a) Li-Ion smart battery -1 nos
b) NIBP pediatric cuff with hose -1 nos
c) Reusable airway adapter to be used with ETCO2 mainstream sensor & cable- 1 nos
d) Multi Function Defibrillator/Pacing padz – 100 nos
e) Reusable CPR feedback sensor/ or similar product reused at least on 90 patients – 2 nos

49) Mechanical Ventilator

- Microprocessor Controlled Intensive Care ventilator capable of Ventilating from Pediatric and Adult patients and with capability to display waveforms.
- Ventilator should be Rugged, Compact and Mounted on its Own Trolley. **Trolley should be manufactured by the original manufacturer and should be imported.**
- Should have an Built in 5.5" screen To Visualize Set and Monitored parameters
- Should have a Built-in Air source capable of Delivering Up to 150LPM with a **1 hour** Battery backup for the Whole ventilator Unit.
- Should have a Built-in High pressure Inlet for Oxygen Source & the NIV should work in combination with all modes mentioned for ventillation.
- Should have the Modes A/C, SIMV, SIMV with PS, and Controlled Mode in Volume Ventilation and **Pressure Controlled Mode and CPAP with PS**
- Should have additional Dual Mode **like** AVAPS/ **PRVC / Autoflow**
- Should have the Following settings for VCV and PCV as Applicable
    a. Tidal Volume 50-2000ml
    b. IPAP 0-50 CmH2O
    c. EPAP/PEEP 4-25 CmH2O
    d. Inspiratory Time 0.3- 5.0 secs
    e. Rate 1-60 BPM
    f. CPAP 0-30 CmH2O
    g. PSV 0-30 CmH2O
    h. Inspiratory Hold 0.1 to 2.0 Secs (VCV)
    i. Rise Time Setting 1 to 6 Relative setting
    j. Ramp Time Off, 5-45 Mins

k. Flow Trigger 1-9 LPM
l. FiO2 Setting 21-100%

- Should have Monitoring of the Following Parameters in all Modes Tidal Volume, Minute Volume, Leak Rate, Respiratory rate, Peak Inspiratory Flow, PIP, MAP. **%** Pt Trigger, I:E
- Should Have User settable alarms for the Following High/Low Tidal Volume, High/ Low Minute Volume, High/Low Rate, Apnea, Circuit Disconnect Etc.
- Battery should be extendable to an additional 3 Hours (Optional).
- Should have the following Compliances IEC 60601-1, 60601-1-2, 60601-2-12.
- Should be European CE **and US FDA** approved product.
- One set each auto cleavable silicon patient tubes for adult & pediatric should be supplied with the system. Should also be supplied with 50 disposable Adult and 25 disposable Paediatric circuits and 100 HME Filters.
- Should have Two nos Autoclavable & Reusable Expiration Cassette /valves for complete dis-infection capability. Company should also quote an additional 20 Expiration Cassette /valves for Highly infectious patient .

50) Pulmonary Function Test Machine with Facility for Spirometry, Lung Volume and Diffusion capacity

1. A computerized spirometry, lung volume and diffusion measurement apparatus.
2. The parameters should be actually measured and not derived ones.
3. Diffusion Capacity should be measured by using the single Breath technique. It should also be possible to measure Diffusion Capacity (DLCO) by the Re-breathing technique.
4. Lung Volume & capacities including TLC, RV & FRC by Multi-breath Helium Dilution Met1.
5. The diffusion system should measure the following :
   a) Slow and forced spirometry (Inspiratory and Expiratory Flow Volume Curve).
   b) Lung sub volumes-Functional residual Capacity (FRC). Residual Volume (RV). Total Lung Capacity (TLC) by FRC-Helium multiple breath technique.
   c) Diffusion capacity of the lung, by single breath technique.
   d) Diffusion capacity of the lung by the multiple breath technique.
6. The system should measure the following parameters
   a) Slow and forced Spirometry.
      VT MVV, ERV, FVC, FEVI, MMEF 25-75%, MEF 50, MEF 75, PEF, PEV6, FEVI/FVC.
   b) Lung Sub volumes
      FRC, RV, TLC, RV/TLC etc.
   c) Diffusion capacity of the Lungs.
      DLCO-SB, DLCO-RB
      The Lung volumes and the DLCO should be done in single maneuver saving time for the test per patient.
7. It should have an open breathing system to prevent cross contamination.
8. Spirometry should have an easy to exchange, bidirectional heated pneumotachograph hardware meeting or exceeding American Thoracic Society standards.
9. Volume Range : 0-20 Litres; accuracy of $\pm$ 0.050L, whichever is greater, flows between 0 to 14 L. per s;
   Flow Range: 0 to 14 Litre/Sec (Linear); Accuracy: $\pm$ 5% of reading.
   Total resistance of airflow at 141/sec should be less than 1.5 cm H2O/L/S.
10. Gas analysers should meet the following specifications : Stability : minimal drift in zero gain; nonlnearity for the analyzers should not exceed 0.5% of full scale; provide a disp. of the measured gas concentrations, accuracy $\pm$ 1%.
11. The system should have carbon monozide analyzer, He analyzer and 02 Analyzer with the following specifications.
    a) Carbon monoxide analyzer
       Range- should be from 0 to 0.4%
       Accuracy should be $\pm$ 0.1%
       Reproducibility should be 0.0006%
    b) He Analyzer
       Range –Should be 0 to 20%
       Resolution/Accuracy should be 0.005%/0.05%

Reproducibility should be 0.2%
95% response time of <15 s to a 2# sten change in belium concentration.

c) 02 analyzer
Range – Should be 0 to 100%
Resolution/Accuracy should be 0.05%/1.0%

12. The system should have a demand valve unit for direct breathing (no Inspiratory bag) from pre-mix gas container, to minimize wastage of gas.
13. The software for diffusion must have program for patient training of DLCO Test without gas. The software must be able to be set values for discard volume, Alveolar time & other parameters according to user requirement.
14. The unit shall be capable of being stored continuously in ambient temperature of 0-50deg C and relative humidity of 15-90deg C. The unit shall be capable of operating continuously in ambient temperature of 10-40deg C and relative humidity of 15-90%.
15. It should have large scale animation programs for patient motivation and co-operation free testing maneuvers.
16. It should be supplied complete with hardware, calibration syringe, mobile trolley, instruction manual, software and other standard accessories including Gas and a P-IV computer and suitable printer from a respected brand.
17. System software should have facility for entry of patient dat and saving of this information in a data base system. It should be possible to configure different report output formats.
18. The system should have fully computerized calibration procedure for flow sensor and gas analyzers. The system should also have a check procedure during start-up.
19. Additional Accessories – Pulmonary Filters (50 Nos); Pneumotach Screens (5 Nos); 3 sets of breathing Tubes for spirometry and lung volume measurements. Reusable mouth pieces (100), nose clips (10), 5 spau sets of gas bags, absorber columns and caps, adaptors for mouth pieces.
20. User/Technical/Maintenance manuals to be supplied in English.
21. List of important spare parts and accessories with their part number and costing.
22. **The system should be upgradable to Computerized Body Plethysmography System with facilities to measure the following Parameters**
    a) Airway Resistance
    b) Static Lung Volumes: VC, ITGV, RV, ERV, IC, IRV, TLC, IVC< VCmax, RV/TLC, FRC
    c) Dynamic Lung Volumes: FVC, FEVI, FEVI/FVC%, FEVI/VC%
    d) Maximal Flows: PEF, FEF75, FEF50, FEF25, FEF25-75%

SPECIFICATION FOR COMPUTER:

- At least 3rd generation Intel core i7 processor, 8GB RAM, 18" to 20" TFT Color Monitor DVD R/W, Keyboard, Mouse, Window 7 / 8, Hard Disc Drive (at least 500 GB HDD) and Laser Color Printer, Trolley & 1 KVA online UPS, to be supplied.

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