Amendment No. XXV Dated 05.07.2018

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Procurement of Medical Equipment CNCI 2nd Campus

All bidders are requested to note the following:

Technical Specification Compiled with all amendment:

Item No 1 MRI 3 Tesla

	Quoted Model : 'State of the art' Whole Body 3.0 Tesla Magnetic Resonance Imaging System optimized for all body applications, including musculoskeletal, vascular, pediatric, hepatobiliary, abdominal, cardiac and neurological applications with super conducting magnet, high performance gradients and digital Radio Frequency System. The manufacturer/ bidder must quote the latest 'state of the art' 3 Tesla MR system as per the specifications below or better. Latest model to be quoted; If any new model in the same series with better specifications is launched in RSNA, then the same should be quoted. Model should be USFDA approved
	Please mention the year of launch of the quoted model offered should be latest RSNA November 2015 launch –or later the manufacturer will guarantee the latest available model at the time of delivery. The detailed specification that follows shall be understood to be minimum requirement.
	The offered model should be US FDA approved. Authentic and legible certificate for the same should be annexed.
	The scanner supplied should not have any refurbished/recycled parts/accessories.
	1 Magnet
A	3.0 T active shielded super conductive magnet should be short and non-claustrophobic.
B	It should have at least 70 cm patient bore with flared opening.
C	Magnet length should be less than 200cm.
D	Homogeneity of the magnet should be better than 1.5 ppm at 40 cms (guaranteed homogeneity)
E	The magnet should be well ventilated and with in-bore illumination with built in 2 way intercom for communication with patient.
F	It should have a built in cryo-cooler such that helium consumption is minimized and does not exceed 0.05 litre/hour.
G	Specify hardware and software for acoustic noise reduction.
H	Active shielding/ Fringe field - quote values for 5 Gauss and 1 Gauss line.
I	External shielding - external interference shield (sufficient to house the magnet, anaesthesia and physiologic monitors) should be provided.
2. A	High performance, highly stable shim system with global and localized manual and automated shimming including 3D shimming for high homogeneity magnetic field for complete imaging, volume imaging & CSI and spectroscopy.
B	Auto shim should be available to shim the magnet with patient in position
	3 Gradient System
A	Actively shielded Gradient system in X, Y, Z planes
B	Amended : 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 44mT/m
C	The system should have efficient and adequate Eddy current compensation.
D	Effective cooling system for gradient coil and power supply
E	Silent MRI" sequence package. Please specify the decibel levels for silent MRI and list the sequences where silent MRI not available to be included in standard package.
	4 RF System
	1.A . Amended a (1) A fully digital RF system capable of Multi Transmission with 2 amplifiers of at least 15kW each or one amplifier of 30 kW, to reduce magnetic susceptibility artifacts. B1 in homogeneity correction should be possible. Vendor has to elaborate on technology used to improve organ specific the B1 homogeneity
	2. A If the vendor has additionally technology like Zoom it/FOCUS or equivalent for selective excitation within a user specified FoV, the same should be quoted. High resolution, distortion free diffusion capabilities should be offered

	B. It should also have at least 32 independent RF receiver channels "acquisition" with each having bandwidth of 1 MHz or more along with necessary hardware to support quadrature array / Matrix coils.
	C. It should support Parallel acquisition techniques with a factor of 12 or more. Highest available PAT factor to be quoted.
	D. Should allow remote selection of coils and or coil elements.
	E. The operating frequency should cover 1H and 31P nucleus (for multinuclear spectroscopy 1H and 31P)
	5 Patient Table
	A. Patient table should be fully motorized with computer controlled table movements in vertical and horizontal directions. (Specify the patient load capacity).
	B. A CCTV system with LCD display to observe the patient should be provided
	C. Emergency manual traction of the subject from the magnet.
	D. Table technology - (1) Bolus chasing with automatic/ continuous moving table should be offered and should be available with fluoro triggered MR angiography for manual and fast switchover in less than 1 second for CE-MRA
	2. Latest table technology available with the vendor (globally) should be quoted (eg. TIMCT, etc.) as optional. (Price for point 2 will not be considered for calculation of L1)
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. The system should have image storage capacity of 100 GB for at least 2,00,000 images in 256 x 256 matrix.
	B. The Image reconstruction speed should be at least 1300 images/second or more for full FOV 256 matrix.
	C. 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 1000 DVD along with the system. The system should be provided with auto DVD writer. MRI system should be enabled and networked to RIS/HIS
	D. Patient monitoring devices for ECG, respiratory rate, pulse rate, O2 saturation at console.
7	Measurement System
	A. Largest Field of View should be at least 45 cm in all three axis. Specify the maximum and minimum FOV.
	B. The measurement matrix should be from 128x128 to 1024x1024. Highest matrix available to be quoted.
	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
	The main body coil integrated to the magnet must be Quadrature/CP of the latest technology.In addition to the in-built body coil, following coils should be quoted. All coils (other than coils for exclusive spectroscopy, like surface coils) should be compatible for parallel acquisitions. The vendor should supply latest coil (with maximum channels and elements) with the best technology available with them at the time of tender submission.
	i. Multichannel Head coil with 32 channels or more for EPI/DTI application.
	ii. Neuro-vascular Coil with 20 or more channels or Head / Neck Coil combined, capable of high resolution neuro-vascular imaging or combination of head & neck coil for similar coverage.
	iii. Spine Array/Matrix Coil for thoracic and lumbar spine imaging with at least 32 channels acquisition per exam
	iv. Body Array/Matrix coil with at least 40 cm z axis coverage for imaging of abdomen, with at least 32 channels Acquisition for body part angiograms and heart. In case one coil cannot provide this coverage then multiple coils should be offered. (The best available body coil with the vendor must be supplied)
	v. Suitable surface coil for peripheral angiography application of at least 32 channels Suitable surface / phased array coil for peripheral angiography application of at least 32 channels with coverage of minimum 80 cm, with single or combination of coils. For Angio application if the coils offered are in combination it will be counted as 1 coil for the purpose of peripheral angiography.
	vi. Bilateral Breast Coil with at least 16 channels with fully functional spectroscopy.
	Vii. Dedicated Shoulder Coil- at least 16 Channel or more.
	viii. Dedicated Knee Coil - at least 15 channels or more. If transmit receive coil is available the same should be quoted.
	ix. Dedicated Wrist Coil - 8 channels
	x. Flex Coil Large (2 quantity) - 4 channel Small (2 quantity)- 4 channel

	xi. Small flex coil for paediatric and neonatal head and neck applications- 4 channels or more
	xii. Dedicated Ankle Coil with 8 channels or more.
	xiii. For Storage of all coils a caddy to be provided.
	xiv. The coil system should permit coverage of 200cm 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 simultaneous scanning without patient) repositioning. i.e. like 4GTIM/GEM/D stream coil combination should be quoted as standard.
9	Application Package Data acquisition:
	i. The system should be capable of 2D and 3D acquisitions in conventional, fast and ultrafast spin echo and gradient echo modes so that real-time online images can be observed if needed. All the sequences that are available with the vendor at the time of quote/delivery should be provided as per their manual.
	ii. 2D multi-slice imaging should be possible in all planes (axial, sagittal, coronal, oblique and double oblique)
	iii Up to 1024 x 1024 matrix acquisitions preferred for all applications
	iv Half Fourier or other techniques to reduce scan acquisition time while maintaining adequate SNR
	v. 3D volume, multiple contiguous slabs, multiple interleaved and multiple overlapping slabs
	vi. Slice thickness in 2D and partition in 3D to be freely selectable
	Vii. Dynamic acquisition (serial imaging) with capability to initiate scan sequences either from the magnet panel or from the console
	viii. Dynamic acquisition: number of repeat scans with delay time either identical time interval or selectable
	ix. Auto slice positioning from the localizer images
	x. Maximum-off center positioning both anterior-posterior and lateral direction and should be selectable
	xi. Gating: physiological signals like ECG, pulse, respiratory
	xii. External signal triggering (interface for triggering input pulse from external source). The provision should be available at the console also (for fMRI, EEG, etc.)
	Xiii. Simultaneous acquisition, processing and display of image data in 2D multi-slice mode.
	xiv. Selection of voxels from oblique slices should be possible while doing spectroscopy.
	xv. Artifact reduction/ imaging enhancement/ image filtering/ image subtraction/addition/multiplication/ division techniques:
	xvi. Flow: 1st and 2nd order flow artifact compensation
	xvii. Presentation slabs: a number of relocatable saturation bands to be placed either inside or outside the region of interest
	xviii. Graphic prescription
	xix. Fat saturation techniques: frequency selective RF pulses to suppress fat signals in the measured image FOV. ROI selective (regional) fat suppression should also be given.
	xx. Magnetization transfer saturation: Off resonance RF pulses to suppress signals from stationary tissue in FOV.
	xxi. Phase contrast capability in 2D and 3D mode: Image intensity correction.
	Xxii. Breath hold acquisition
	xxiii. EPI mode
	xxiv. DTI with MDDW or equivalent with a minimum of 12 and selectable up to 64/256 direction encoding
	xxv. Data acquisition in all three standard planes (axial, sagittal and coronal) and oblique and double oblique planes or more oblique planes
	xxvi. Higher matrix acquisition capability in single shot EPI. Acquisition time, TR, TE and slice thickness should be clearly mentioned and supported by data sheet reference.
	Xxvii. The vendor should offer multi coil acquisition in order to optimize throughput increase and increased effective FOV. Individual acquisition elements of every coil should be mentioned.
	Imaging pulse sequences:
	i. All standard and special pulse sequences available at the time of quote/delivery should be offered and quoted in the bid. Fat suppression for high quality images both inversion recovery and Dixon method/ IDEAL/ 3D Dual Echo/ m-Dixon. The system should acquire motion artifact free images in T2 studies of the brain in restless patients (Propeller, Multivane, Blade, etc.). Dynamic study for pre and post contrast scans and time intensity studies.
	ii. The system should be capable of selecting TR and TEs as per requirement in majority of the pulse sequences.
	iii. Spin echo (SE): multi-slice single echo, multi-slice multi-echo (8 echo or more), SE with symmetrical and asymmetrical echo intervals and fast spin echo. MT-SE imaging sequence.

	iv Inversion recovery (IR): including short T1 modified IRSE, FLAIR, DIR (Double inversion recovery).
	v. Gradient echo (GE): with transverse gradient/ RF spoiling and transverse gradient rephrasing, e.g., GRASE or equivalent etc. 3D gradient echo with shortest TR and TE, free choice of angle selection, while maintaining SNR
	vi. Fast sequence
	vii. Fast spin echo and GE sequences in 2D and 3D mode with T1,T2 and PD contrast capable of acquiring maximum number of slices with a given TR at minimum TE, echo train should be at least 256 or more in fast spin echo mode
	viii. Half Fourier acquisition capabilities should be available with/without diffusion gradients and in combination with fast spin echo
	ix. Fast inversion recovery with spin echo
	x. Fast gradient spin echo IR multi-slice multi-echo mode with maximum ETL. Sequences should incorporate RF focusing to acquire ultra-fast gradient spin echo
	xi. Fast gradient echo sequences should incorporate RF spoiling and other technique to acquire images in ultra-fast 2D and 3D modes, gradient echo with ETL of 255 or more.
	xii. Fat and water suppressed imaging sequences
	xiii. EPI optimized sequences (with and without fat suppression) with ETL of 255 or more.
	xiv. For T1, T2, PD imaging, perfusion, regular diffusion values (at least 5b, 3 directions) EPIFLAIR, EPI-IR, EPI-FLAIR diffusion tensor, EPI-MT-FLAIR, tensor diffusion (at least 16 b values in minimum 32 directions) and diffusion studies. Suitable artifact/ fat suppression techniques to be incorporated in the sequence to have optimum image quality.
	xv. There should be capability of calculating ADC map(isotropic and anisotropy from the regular diffusion and tensor data)
	Xvi. Optimized sequence package for special applications.
	Special application packages:
I	Please give details of licensees for acquisition post-processing and for special packages quoted for the following applications
A.	Neuro Applications
1	Functional MRI accessories and post-processing:
	i. Functional Imaging with package for BOLD Imaging and spectroscopic imaging and processing package capable of real-time processing and display of color overlay (in real time) using 32-channel head coil being supplied with the system.
	ii. Complete MRI solution including audio-visual projection system
	iii. The audio-video projection system should have the capability to project movies to the subject, and should be compatible with the 32 channel head coil, and should include all attachments that may be required for complete integration
	Iv. The system should be integrated with stimulus presentation/ paradigm generator along with licensed software (like super lab, eprime, presentation, etc.) which is capable of presenting audio-visual, audio, video (multiple formats), etc.
	V. The paradigm presentation should be synchronized with the scanner (for starting and ending along with measurements)
	Vi. Integration and provision near the console for external trigger (of the sequence) for synchronizing MRI acquisition with paradigm
	Vii. Post-processing work station / server with post-processing software and hardware associated, with licences for processing the BOLD data (with required licensed operating platform required like MATLAB, IDL, etc.)
	Viii. The entire MRI hardware package should be from a single vendor for complete integrated solution. Please specify the vendor.
2	2D/3D Arterial Spin labeling
3	Perfusion imaging of brain with software for rBV, CBV etc analysis.
4	Susceptibility weighted imaging with phase information (i.e. SW1/SWIp/eSWAN 2.0)/Venous BOLD Imaging Multi Direction DTI with minimum of 32 directions. (Complete package including DTI quantification and tractography software). Prospective motion correction enabled software preferred. Spinal tractography should also be possible.
5	T2 Relaxometry and volumetric analysis for Hippocampus
6	3D-T2 weighted Turbo Spin for volumetric acquisition reconstructed in any plane e.g. for
	lumbar spine and for nerve root analysis
7	High resolution imaging for inner ear. Please specify sequences eg. CISS or equivalent
8	The system should have facility for flow quantification of CSF aqueduct, spinal canal, vessel flow. Both retrospective and prospective gating should be possible.
9	Whole spine imaging with fusion software.
10	Real time Brain Wave, Pre Acquisition / post processing or Inline BOLD or BOLD Specialist.

11	Sequences such as Double Inversion recovery for "Plaque Imaging' in Carotids to be provided.
12	MR ventriculo graphy, cisternography, myelography
	B. Cardiac applications: (optional)
1	Advanced Cardiac Applications: ECG 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. Myocardial tagging, STIR for cardiac use, stress perfusion, 3D acquisition of whole heart in one breath hold. Complete cardiac evaluation package to be included on the workstation, besides the main console. 2 T1, T2, T2 quantification. Tools for evaluation in real time with automated guidance
	C. Musculoskeletal:
1	High resolution imaging for cartilage and musculoskeletal imaging. Parametric MAP be available. dGEMERIC or equivalent, radial imaging for menisci and labrum
2	The system should have software package for evaluation of bone marrow.
3	Whole body screening imaging studies for metastasis.
	D. Hepatobiliary and abdominal system.
1	High resolution Abdominal and Liver imaging in breath hold and free breathing modes with respiratory triggered volume acquisitions with navigation, liver iron quantification and liver fat quantification software, and spectroscopy
2	The system should have basic and advanced MRCP packages including free breathing and 3D techniques.
	E. Vascular Imaging
1	MR angio Imaging Should have 2D/3D TOF, 2D/3D Phase contrast (with and without gating and magnetization transfer saturation), black blood angiography for cerebral, pulmonary, abdominal and peripheral vessels and TONE, ceMRA, Facilities for high temporal and high resolution 4D angio imaging for time resolved vascular imaging with imaging frame of 40 frames/sec or more.
2	Bolus chasing with automatic and manual triggering from fluoroscopy mode to 3D acquisition mode with moving table facility for whole body application. Specify table movement. Inline subtraction should be available.
3	Non contrast enhanced peripheral angiography for arterial flow with Native/ Trance/inhance sequences.
4	Time resolved angiography with contrast kinetics like 4D TRACKS/ 4D BLISS/KTblast / TRICKS /TWIST or equivalent
5	Perfusion study in organ systems like kidney, brain, heart etc. with T1 perfusion with permeability maps, and quantification of rCBF/ rCBV, MTT, etc, with color maps.
	F. Breast Imaging:Advance package including diffusion, spectroscopy and perfusion with time intensity curve.
	G. Diffusion Weighted Imaging with at least b value of 7000 or more. Whole body diffusion weighted imaging with background suppression Whole body screening imaging studies for metastasis. The system should have facility for flow quantifications of CSF, vessel flow and hepatobiliary system
	H. Spectroscopy:
	The system should have the Hydrogen, Single Voxel spectroscopy, Multivoxel, Multislice & Multi-angle 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 and the workstation and each of the five clients. Complete prostate, breast, liver spectroscopy hardware and applications should be provided. Spectroscopy phantom for important short echo time neurometabolites, breast and prostate Water and lipid suppression in automated sequences.
	I. Prostate Imaging with Parametric cards (Ktrans, Kep, Ve, Vp) – quote this as standard.
	J. Workflow improvement Techniques with availability of “Previous ” Scans” .
	(2) Integrated exam planning should be possible. All filming, viewing and export options should be possible. Optional price for breast, joints including shoulder, hip, knee and for other applications to be provided. (Price for point (2) will not be considered for L1 calculation).
10	Additional software and hardware & Accessories will be as follows:-
I	Multi Nuclear Spectroscopy: Facility of P31 Imaging & Spectroscopy. Double tuned surface coil for P31 Imaging and spectroscopy for brain &breast to be quoted as standard.
Ii	Double tuned head coil for 31P and 1H spectroscopy. The operating frequency should cover 1H and 31P nucleus (for multinuclear spectroscopy 1H and 31P) to be quoted as standard.
iii	MR elastography to quoted as standard
Vi	TIM whole body suite. Any other hardware, software application packages with the tender to be quoted as standard.

Vii	Breast coil, biopsy attachment – 4 channels to be quoted as standard.
Viii	Coil of cardiac application to be quoted as standard.
11	Additional workstation:
	Client server architecture-server with at least three concurrent licenses is required(Dexus, intelligence portal, Syngo. Via etc or higher) capable of rendering 20000 images at peak performance. Workstation hardware should be industry standards, and should be the latest with the vendors, as per their globally launched product catalogue
A	A Server workstation with preferably the same user interface as of main console is required with the availability of all necessary software including.
I	Basic post-processing software including MIP, MPR, surface reconstruction and volume rendering technique, Image fusion , 3D evaluation on all five concurrent clients.
Ii	All optional items to be quote as standard.
iii	The system should support the DICOM print service class as a service class user (SCU)
Iv	Workstations support the DICOM query and Retrieve SCU
V	Workstation should retrieve MR spectroscopy images.
B	desktops with i7 , 6th generation , Intel Processor , 8 GB DDR3 RAM, 500 GB SSD (Solid state Drives) 1 TB HDD 24” LED Medical Grade Monitor - Total five Clients Each of the client should enable printing in laser film camera and color printers. Total 5 client hardware and software to be provided.
C	The offered System is to be networked with the then existing "Department Network" including PACS. Appropriate anti-virus protection to be provided by the Vendor. The vendor should provide picture storage and archival system, to store and retrieve MR images
D	The system should have DICOM 3.0 compliant interface and enabled for networking connectivity to Linux/ Windows based servers/ clients with patient ID labelling and integration to generic hospital information system/ PACS
	Module for scheduling and imaging
	System should be integrated with RIS
G	The workstation should be enable printing in laser print camera and colour printer
12	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
	13 Accessories
A	DICOM compatible Dry Chemistry laser camera (1 No.s) with integrated processor for filming from main console & workstation. The camera should be capable of printing on films of 14" x 17", 11" x 14" and 10" x 8" sizes in a resolution of 600 or more dpi. It should be possible to connect other imaging modalities to the printer. 2000 compatible films to be provided. Films to be provided after installation as and when required by the user. Main equipment (MRI) in the emergency block to be networked with cameras of CT and DRF camera in the emergency block
B	A color laser printer for printing high-resolution color-coded 3D images and protocols on plain paper in 1200 dpi resolution or more than 20 ppm or alternatively a dedicated color printer for medical images
C	The UPS system should be provided for complete MRI unit with Chiller and emergency lights with at least 30 minute back up, preferably 150 kVA or more (specify kVA). An emergency door or hatch should be provided in RF cabin.
D	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.
E	Dual Head MRI-Compatible Pressure Injector (minimum 2000 Gauss line) with 500 sets of syringes (Two syringes & connecting tubing per set). It should be compatible with 50 ml syringes for both saline and contrast
F	Non-magnetic I/V stand
G	G Water Chiller for Cold Head and Gradients

H	Two Non-ferromagnetic MR compatible patient transfer trolleys should be globally repudiated make
I	Fire Fighting System, Detectors and 6 Fire Extinguishers (MR Compatible)
J	Hand held metal detectors - 2 Nos
K	Closed circuit CCD camera for patient observation.
I	Phantoms for image quality audits
M	Defibrillator Biphasic with ECG recording with Adult and Paediatric paddles
N	MR Compatible Infusion Pump (2000 Gauss Line)
O	Patient positioning accessories with hand held alarrn & look-out mirror.
P	MR Compatible Transport Ventilator. (1000 Gauss Line)
Q	Two desktops with i7 , 6th generation , Intel Processor , 8 GB DDR3 RAM, 500 GB SSD (Solid state Drives) 1 TB HDD 24" LED Medical Grade Monitor with two laser Printers of 600 dpi, UPS & Dictaphone
R	SPECIFICATION FOR MRI COMPATIBLE ANAESTHESIA MACHINE (1000 Gauss Line) & MRI COMPATIBLE MONITOR or (1000 Gauss Line)
12	MRI COMPATIBLE ANAESTHESIA MACHINE SPECIFICATIONS: (Minimum 1000 Gauss Line)
	A. Should be MRI compatible at 3T, antistatic,heavy frame & base with good quality castors with front brakes, with following features
	I. Three gas model viz Oxygen, Nitrous oxide and Air.
	Ii. Should be compact, ergonomic, easy to use and easy to maintain.
	iii . Should have separate fresh gas outlet for use in open circuit.
	Iv .Machine should have flow meters for Oxygen, Nitrous oxide and air. Emergency Oxygen flush should be available. There should be facility to select oxygen-air or oxygen-nitrous oxide with the help of a separate switch or knob.
	V. Dual flow sensing capability at inhalation and exhalation ports.
	Vi. Should have paramagnetic/ galvanic cell oxygen sensors. In case of galvanic cell sensors, the firm should supply free sensors for the entire warranty period of 5 years. In case of Paramagnetic sensors, the firm shall ensure that there is no down time during repair of these sensors (if necessary) and provide a standby alternative.
	Vii. Shall have back-up Oxygen Control which provides an independent fresh gas source and flow meter control in case of failure.
	Viii Pressure regulators shall be of modular design.
	ix Should have oxygen fail safe device & an auxiliary built in oxygen flow meter.
	X. Electronic or Mechanical Hypoxic Guard to ensure minimum 25% Oxygen across all O2– N2O mixtures and Oxygen Failure Warning.
	Vaporizers:
	Xi. Facility of mounting minimum two Vaporizers, latest technology , key filler, selectatec type, tool free installation ,meaning any vaporizer of our choice can be mounted at will with interlocking facility.It should be preferably of the same make as that of machine.
	Xii. Temperature ,pressure and flow compensated with high accuracy of delivered concentration of volatile anesthetic agent. Should be maintenance free.
	Xiii. Two Vaporizers should be supplied (Isoflurane , Sevoflurane).
	Ventilators:
	Xiv. The Machine should have an Integrated Anesthesia Ventilator System, facility to vary respiratory parameters and should be able to ventilate adult and Pediatric patients including infants.
	Xv. Ventilator should have Controlled ,Manual, Spontaneous modes and provision for PEEP.
	Xvi. Tidal volume (inspired and expired) respiratory rate, 1 :E ratio, minute volume Airway pressure & FiO2 should be continuously displayed.
	Xvii. Should have Tidal volume and fresh gas compensation mechanism.
	Xviii. Audio-visual alarms for high and low settings of Pressure, volume and disconnection should be present.
	Xix. Tidal Volume (VT) 20-1500ml (Volume Control) ,Rate atleast 4-80 BPM.
	Xx. Inspiratory / Expiratory ratio (I :E) 2:1 to 1:6 &Peak Flow -100 to 120
	Xxi. Ventilator should have at least 30min rechargeable battery backup for ventilator.
	Xxii. Machine should have an integrated breathing circuit with circle absorber of good quality, easy to clean, autoclavable , fewer parts to reduce leaks.
	xxiii. Machine should have mounting capability of One O2 and one N2O pin-indexed cylinder

	Xxiv. Adult autoclavable (2 sets) breathing circuits & one paediatric circuit to be provided.
	Xxv. The Machine should be equipped with AGSS.
	B) MRI COMPATIBLE MONITOR (Minimum 2000 Gauss Line)
	Specifications for MRI compatibility:
I	Monitor should be quipped with MRI shielding and set to Remote Communication Mode.
II	Should be MRI compatible (Safe will not be acceptable) at 1000 Gauss, 3.0 Tesla and 4W/Kg SAR.
iii	System should include fiber–optic SPO2 finger sensor, MRI compatible ECG Patient
	Leads and Electrodes, NIBP cuffs, hoses and etCO2 sampling kit and temperature probe.
	General Specifications for Monitor:
I	The Monitor should have adult and neonatal application and should be user friendly.
Ii	It should be capable of monitoring ECG, non-invasive blood pressure ,oxygen saturation
	(SpO2) ,ETCO2 and temperature.
iii .	It should have an internal battery which should last for 30-40 min.
Iv	It should be operational at wide temperature (10 degree Celsius – 40 degree Celsius) and humidity (20% to 90%).
V	It should have a facility of 24hours data storage of trended parameters and trend graph of 1,2,3,6,12 or 24 hours display format.
Vi	Should have a facility to deactivate all the alarms if necessary.
	ECG Monitoring: Essential Specification:
I	Available leads : I,II,III,V,AVR,AVL,AVF with facility for recording 12 lead ECG.
Ii	Should display one or all the selected leads at a time.
Iii	Accuracy of +- 5% of the rate.
Iv	Monitor Mode : Digital Signal Processing (DSP).
V	T-Wave suppression for high field MRI.
Vi	Should have arrhythmia monitoring facility.
Vii	Should have user selectable alarms.
	Heart rate measuring ranges 15-300 beats/min.
Viii	**Pulse Oximeter (SPO2):**
	I. Should provide a digital value of the arterial oxygen saturation as well as diagnostic plethysmographic pulse waveform.
	Ii. Measurement range : 0% to100%.
	Iii. User Selectable upper and lower alarm limits.
	Iv. Probes with finger and ear sensors for adult, paediatric and neonatal use.
	V. Should be sensitive and function accurately even at low perfusion states of low blood pressure or hypothermic conditions.
	ETCO2 Monitoring:
	I. Should have side stream Carbon di-oxide module and display both graphically and numerically.
	Ii. Single beam ,non-dispersive infrared (NDIR) absorption, radiometric measurement, no moving parts.
	Iii . Initialization time less than 10 seconds, full specifications within 1-2minutes.
	Iv. Carbon di-oxide range should be 0 to152 mm Hg barometric pressure supplied by module itself.
	V. Should be able to detect breath rate in the range of 2-150 BPM.
	Vi. Respiratory rate accuracy should be + 1 breath.
	Vii. Barometric Pressure auto compensated from 400mm Hg to 850mm Hg.Operator selectable O2, N2O,HE and Agent Compensation.
	Viii. No routine user calibration required. An offset calibration should run automatically when the ambient temperature is not stable.
	ix. Sampling line should have both nasal sampling line and extension sampling line.

	X x. Warm up time 10seconds.
	Temperature Monitoring:
	I. Measuring range: 5 to 50 degree Celsius.
	Ii. Accuracy + 0.1 degree Celsius.
	Iii. User Selectable upper and lower limit of alarm.
	Iv. Core and skin probes.
	Non-Invasive Blood Pressure (NIBP) monitoring:
	I. Should automatically sense infant / adult cuffs and set appropriate inflation pressure and safety limits.
	Ii. Operating Modes : Automatic ,Manual ,Stat.
	Iii. Accessories ,NIBP cuff :
	1. Adult for thigh and arm.
	2. Paediatric
	3. Neonatal
	14 Guarantee
	I. Principals and Indian counterpart. The Principals should be responsible for any lacuna or deficit in service or supply.
	I. All items in the supply order should be supplied during the time of installation, No exceptions will be allowed .Items under Research. Agreement should be finalized well in advance (after receipt of supply order). So that there is no delay in delivery of software or coil or any other accessories.
	Ii. Software updates (where hardware upgrades are not required)like new pulse sequence, new application package etc. should be provided within one month after release worldwide (any country,viz. north America/ Europe/Germany etc).In case, the same is not provided in time, the parent company should undertake the responsibility to implement the same. This is to make sure that the machine stays updated with similar products for at least 5years.
	WARRANTY PERIOD
	I. The equipment should have 5 years warranty from the date of handing over the fully functional unit of all coils and the accessories supplied (such as UPS,AC,, etc)\ to the hospital against manufacturing defects of material and workmanship. The Helium Supply and cold head repairs (including replacement. If needed) should be included in the warranty period.
	Ii. Even during the warranty period, the desired uptime of 95% of 365 days (24 hrs basis) will be ensured. In case the down time exceed the 5% limit, Penalty will imposed as per bid document.
	Iii. Note any Liquid Helium due to quenching or due to any other causes during the warranty period shall be borne by the firm.
	Iv. If any particular coil is not working resulting in non functioning of a particular clinical application for more than 3 days it will be considered as downtime .
	POST GAURANTEE ANNUAL COMPREHENSIVE MAINTENANCE CONTRACT (CMC)
	v. The post –warranty (after 5 years) CMC should be comprehensive and should include helium and cold head (repair and/ or replacement) + labour + spares for the complete system which includes all the accessories supplied such as UPS, AC, etc. (including all consumables like batteries for UPS,.) and maintenance for another 5 years. This CMC should be quoted in Indian Rupees.
	vi. The price of post warranty 5 years CMC shall be taken for price comparison. Price of all optional Items must be quoted separately and will be taken into consideration of final price bid evaluation for L1
	Penalty clause: Penalty at the rate of RS.15,000/ per day for short falling of 95% uptime guarantee. If the machine lies non-functional for a period of more than two weeks continuously, the same penalty will be imposed even if 95% uptime clause is met with for the given calendar year.
	Uptime guarantee: During warranty and the CMC period, the uptime of the system shall be at least 95% of the 365 days in a year. If downtime exceeds 5%, there shall be a penalty of Rs.15,000 / per day.

	Calculation of uptime: The machine shall remain in working condition/fully functional for minimum 347days (being 95% of 365 days) during the year. For leap year, the machine shall remain in working condition/fully functional for minimum 348 days (being 95% of 366 days) during the year. Sunday and other holidays as per the institute policy would be counted calculation of uptime, if the machine was in working condition/fully functional on both days i.e the day preceding Sunday/holiday and the day succeeding Sunday/holiday. Further, routine maintenance as per scheduled agreed by user would be counted towards calculation of uptime. In case downtime is more than 5 hours on any particular day during normal working hours of the institute the same day would not count towards uptime calculation.
	Calculation of down time: Down time calculation would start from the reporting of the down time by the representative of the institute by agreed mode of communication i.e. telephonic communication or email or as per the data of the remote access of the machine(s) by supplier, if any, whichever is earlier.
	vii. The down time would be calculated by deducing total uptime period as defined above from total days of the respective year. Year for the calculation of Uptime/downtime as the case may be would be considered from 01st January to 31st December of the respective year. For purpose of the downtime calculation breakdown of the machine shall be calculated as under. If no imaging is possible then its complete breakdown. If only some functions of the machine are not working in that case it shall be considered as partial breakdown equivalent to 50% of the complete breakdown for calculation purposes.
	Viii. The rate of post-warranty comprehensive CMC should be offered for at least five years by the bidder and be offered in Indian Rupees only.
	ix. Note any liquid helium due to quenching or due to any other causes during the CMC period shall be borne by the firm.
	x. If a particular coil is not working resulting in non working of a particular clinical application for more than 3 days will be considered as downtime
	xi. All local items should be quoted in Indian Rupees. Other items should be quoted in US Dollars only, to have uniformity. The technical and financial bids should be separate. 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. The system should incorporate all the features as per the November 2015 RSNA standards/declaration.
	xii. All product catalogues in original.
	xiii. When the vendor data sheet disagrees with the bid response, clarification should accompany in the form of letter/certificates from the principals in original.
	xiv. System should be DICOM - 3MPPS & should be ready to integrate with any existing PACS/HIS System
	xv. List of all installations of the system in the country
	xvi. The compliance statement must be filled strictly under headings given in the tender.
	Xvii. Each specification corroborated in the compliance statement must give the page number where it is listed in the original technical data sheet along with soft copy. The technical bid should clearly mention model number and make, detailed technical specifications, quantity of each component offered. the technical bid should be duly supported by original brochure/catalogue of the manufacturer and relevant parts proposed to be supplied highlighted. In compliance statement units of measurement used should be same as in the required technical specifications.
	Xviii. There should be no discrepancy between specifications given in technical bid, brochure and compliance statement. In case of any such discrepancy, the technical bid will be disqualified.
	Xix. The quotation should clearly mention the accessories (including quantity) which are part of the main equipment and the price of which is included in the main equipment.
	15 Training :
1	Off site training of all departmental faculty members for two weeks in a reputed institute. Departmental books as asked by HOD.
2	On-site training for radiographers and other staff by an application expert for a period of
	at least 3 months
3	One on site service engineer and one on site application specialist to be available for a uninterrupted continuously break period of two months with the team of both engineers will maintain log book of training provided to technical staff & doctors
	i) All necessary licences for connectivity with treatment planning system, Linear accelerator and Brachytherapy machine.

	A separate MR compatible Flat table top for imaging suitable for Radiotherapy Planning is needed. No software is required.

Turnkey Works For 3 Tesla MRI Unit

1. The layout plans (with dimensions) allocated uploaded. Air-conditioning of appropriate strength/capacity (tonnage) in the area as required shall be done. Additional standby split air conditioner(s) of appropriate strength/capacity (tonnage) to be fixed in the main equipment rooms.
2. Civil work: In the civil works Modifications/Renovations in the existing rooms by the supplier/vendor as shown in the layout plan after approval by Purchaser/HSCC shall be executed as per approved makes specified.
3. The walls of MRI Complex should be finished acrylic/plastic emulsion (approved makes) and should be finished with vitrified tiles (approved makes) up to five feet height from the floor. Colour as approved by Purchaser/HSCC shall be provided.
4. The flooring in the MRI complex should be as per regulations. Flooring in all rooms shall be of vitrified tiles of 80 x 80cm size or other close appropriate size of reputed makes (approved makes). Colour as approved by Purchaser/HSCC shall be provided.
5. Whole area of MRI Complex as in the layout plan shall be finished with fire resistant false ceiling material (approved makes). MRI Room PVC roll flooring with mineral fiber panel false ceiling and Aluminium suspension.
6. All the doors should be provided with necessary fittings with hydraulic type door closures (approved makes) and with Mortised locks (approved makes).
7. Electrical work: The firm is required to specify load requirement i.e. required for the unit, the air conditioning, room lighting and accessories, if any. The electrical works should be as per approved makes mentioned. The electrical works should have minimum two separate Earthing with copper plate is to be provided for the each equipment and air-conditioning equipment as per equipment requirements. The use of earth leakage circuit breaker will be as required.
8. A distribution panel of appropriate capacity is to be provided by hospital. The load shall also be provided by the hospital. From the substation of the hospital to the distribution panel, cable of appropriate size shall be provided & fixed by the hospital. Vendor shall do cabling from distribution panel up to the equipment.
9. The switch gears (MCBs / ACBs/ MCCBs), L.T. distribution board for MCBs etc. (approved makes).
10. Electrical wires should be of copper of different capacity as per the load (approved makes).
11. For Telephone wiring cables (approved makes). Telephones to be provided in all rooms with EPABX system having control in office.
12. Modular range Switches / Sockets of approved makes should be provided and fixed as per requirement.
13. LED lights of suitable illumination should be provided of Phillips/GE/ Crompton/Syska make.
14. Light dimmers (down lighters) should also be fixed in the equipment room.

Air conditioning:

1. Split Air conditioners of reputed make (approved makes) to be provided by the vendor in whole complex as per requirements (to maintain appropriate temperature in the main equipment room & other rooms) and as per regulations of AERB.
2. Standby additional split air conditioners of appropriate strength/capacity (tonnage) to be fixed in the main equipment room Hygrometer Nos.1 to be provided.
3. In-built or External De Humidifier in Equipment, Console and Examination rooms to be provided as per room layout.

Fire Protection

1. Non water based fire protection is to be integrated as per requirement. Fire extinguishers of appropriate types (approved makes) should be fixed in different rooms as per requirement. Heat detectors/hooters/photoelectric/smoke detectors (approved makes) shall be provided in all the rooms and corridors as per requirements. In case the expiry date of fire extinguishers is before the completion of 5 years comprehensive warranty period, extra set(s) of fire extinguishers will be supplied by the vendor till the completion of the 5 years comprehensive warranty period. Besides, any works required as per statutory/Delhi Fire Services norms shall be executed by the vendor.
2. The vendor to also install the following:
   i. Audio visual Music systems for patient waiting areas.
   ii. Adequate Pest, insect and rodent control system to be provided and installed to ensure that area remains insect, pest and rodent free.
   iii. Music and Public Address system for calling/ informing the patients in the waiting areas.

Furniture:-

Following furniture (Godrej/Debono/Delite) will be provided:

1. Chairs with castors and armrests 2 nos.
2. Coil Rack for MRI 1 No.
3. Medicine Trolley 1 No.
4. Ultrasonic pest repellent equipment 1 no.

5. Insect killer equipment 1no.
6. Steel Storage Almirah 2 nos.
7. Overhead Storage(1.2x0.4x.6m) for CD storage 1 no.

In case any item missed out inadvertently, vendor shall provide the same. The price quoted by the bidders shall include all costs required for supply, installation, testing and commissioning of the equipment on turnkey basis and as per bid document.

Item No 2 CT Scan 256 Slice

	Specification as per tender: The system quoted should be latest state of art top of the line with the features of latest RSNA (2014 or later) release. The system to be of 128 or more physical rows of detectors with dual energy application. The scanner should be capable of comprehensive whole body imaging including cardiac, abdomen, neuro and vascular imaging applications, true isotropic volume acquisition. It should also be capable of 3-D reconstructions at fast speeds, quantitative calcium scoring in the vessels using all documented quantification algorithms, 3-D image display during acquisition on-line as well as real time, 3-D vessel imaging with feasibility for volume rendering.
	Please note that if new technological developments occur and an upgraded system becomes available between the notification of this tender and the time of finalization of the bid, then the newer upgraded version shall be supplied at the rates quoted. The AERB compliance for the equipment and its installation would be the responsibility of the supplier.
	1) Gantry:
	i) The CT Scanner should have low Voltage Slip Rings incorporated in the Gantry
	ii) The Minimum scan time for a 360 Degree rotation should be less than or equal to 0.35 seconds.
	iii) The gantry should be provided with User control panels on either side for easy positioning.
	iv) The sub millimetre Slice @ 0.63 mm or less in 128 rows or more of detector with 256 or more acquisitions should be available. The system should be in position to perform256 acquisition Slices/ Rotation for general, cardiac/vascular applications. (Specify the submillimetre slice thickness in millimetres)
	v) The Gantry should have 3D Positioning Laser lights.
	vi) The Scan field of view (FOV) in acquisition mode should be at least from 200 mm to 500 mm with intermediate Steps for scanning different anatomies.
	vii) Aperture should be at least 70 cm diameter.
	2) X ray Section:
	i) The X ray Generator should be compact and inbuilt in the Gantry.
	ii) The System X ray power should be 100 kW (actual power) and above
	iii) The mA range available should be between 20 to 800 mA or more with increments in steps of not more than 10mA.
	iv) The X ray Tube should be essentially Dual Focus. The heat storage capacity should be 7 MHU or equivalent. Specify the method and technique of cooling. Any special feature of the X ray tube to be highlighted with literature.
	v) Specify the focal Spots of the X ray tube.
	vi) The X ray tube should have a cooling rate of not less than 1000 KHU per MIN
	vii) The X ray tube Cooler Unit should be in built in the Gantry.
	3) Detectors:
	i) The Detector Offered should be Solid State.
	ii) at least 128 physical detectors rows as single layer/dual set/dual layer.

	iii) The detectors should not require frequent calibration.
	4) Patient Couch:
	i) The patient table offered should have a minimum load bearing capacity of at least 200 KG.
	ii) The Minimum table top height should not be more than 65cms from the floor level
	for easy transport of trauma patients.
	iii) The Floating table top width should be at least 40 cm for better comfort.
	iv) The range of metal free scan should be at least 165 cms.
	v) The vertical range should be at least 55 cms (max height — min height)
	vi) Specify the reproducing accuracy of the table.
	vii) Remote FWD/BWD of the Patient Couch should be standard
	5) Topogram:
	i) Length and width: specify range.
	ii) Scan times: specify range, specify whether real-time image option available.
	iii) Views: should be feasible in frontal and lateral views
	iv) Should be possible to interrupt acquisition manually if necessary.
	6) Spiral/Helical Section:
	i) The system offered should have Spiral Capability of at least 80 seconds & above. Real Time Spiral @ 10 f/s should be standard.
	ii) The range of Spiral facility in Axial Direction should be more than 100 cms.
	iii) The Reconstruction Time in Spiral scan should not be more than 100 Milli seconds.
	iv) The system should have the Smart Prep or equivalent facility & ability to track Contrast medium to trigger scan should be included in the scope of Supply.
	v) High Resolution scan package should be offered as standard and Specify the minimum slice thickness for which High Resolution scan package is possible.
	vi) Multi Slice CT Fluoroscopy to be quoted as standard.
	7) Computer Section:
	i) The Computer offered should be the Latest Multi-tasking Processors and a menu driven platform with a RAM size of at least 4GB.
	ii) The medical grade monitor should be the latest Color of at least 18 inches and flat screen. Two Monitors Independent Console preferred. The Twin Monitor system should work on either shared or Common data base.
	iii)The display matrix should be at least 1024 x 1024.
	iv) The reconstruction time for an Axial scan should not be more than 100 milli seconds.
	v) The Hard disk Capacity for both Image and Raw data should be more than500GB.
	vi) It should have facility to store at least 250,000 Images.
	vii) The system should be supported with archiving facility of DVD & CD Main Console.
	viii) DICOM facility to send , store , print , receive, Query / Retrieve , MWM , MPPS etc should be standard.
	ix) PC Based connectivity should be standard for easy transfer of Images & Report. The image transfer from main console to workstation should be automatic and immediate.
	x) CT should be with dual monitor console with two concurrent workstations (thin client server architecture based solution) comprising of medical grade monitors (2 mega pixel resolution) with at least 8GB RAM. The server should have image storage capacity of 3 Tera bytes, minimum 20000 concurrent slice processing power and at least 32 GB RAM. It can be single/dual server configuration. The two concurrent workstations should have processing capabilities for basic 2D /3D and following advanced applications.
	a) MPR

	b) Minimum and maximum intensity projection.
	c) 3D volume rendering.
	d) 3D SSD (Shaded Surface Display).
	e) Advanced vessel analysis.
	f) Auto bone removal.
	g) Lung nodule assessment.
	h) Liver lesion analysis.
	i) Virtual endoscopy.
	j) Dedicated Colonography and colonoscopy.
	k) Time point comparison.
	l) Whole organ (Brain & Body) perfusion CT.
	m) Coronary tree analysis: automated 3D processing of coronary arteries, calcium scoring, stent analysis, LV analysis.
	n) Neuro DSA with Automated Bone Removal.
	o) Fusion CT: Fusion of morphological data of CT & MRI.
	8) Image Processing section:
	Cardiology and Oncology post processing tools to be quoted as standard. The post processing tools of the perfusion and others as quoted below to be available in the workstation.
	i) The system should have standard software like 3D Volume rendering , MIP,CT angio, color angio Display, CT Perfusion , Dental scan , Bone Mineral Study should be available as standard on the Workstation . Computer Aided Detection (CAD) to be provided for lungs and colons.
	ii) The following software should be offered as standard (MPR , ROI, VOLUME CALCULATION , CT NUMBER DISPLAY , WINDOW WIDTH , WINDOW LEVEL , TOPOGRAM DISPLAY , CINE DISPLAY , HRCT LUNG, DYNAMIC SCAN)
	iii) Cardiac Scan Attachment with ECG Gated Segmented Recon , Calcium score , Vessel Flythrough of the Coronaries should be available with software package at workstation and thin client server stations
	iv) Automatic display of MPR Images after scan will be preferred.
	v) Bolus triggered Brain Perfusion CT study (at least 3-level) with automatic CBF, CBV, MTT, TTP maps, ROI placing, comparing ROI, saving maps.
	vi) Neuro DSA with automatic bone removal software.
	vii) Dental CT: high-resolution evaluation of teeth and jaws with automatic panoramic and paraxial reconstruction, evaluation of mandibular canal and life size filming.
	viii) Fusion CT: fusion of morphological data obtained on CT, MR or DSA.
	ix) Lung CT: low dose lung CT protocols for advanced lung nodule detection, assessment and follow-up. Lung segmentation software for nodule detection. Provide LUNG CAD for virtual bronchoscopy .
	x) provide Dental CT software.
	xi) Post processing should also have liver segmentation analysis, whole body perfusion, tumor tracking, myocardial assessment.
	9) Resolution:

	i) The System Spatial Resolution should be mentioned with parameters.
	ii) The high contrast resolution should be more then 14.5 lp/mm in all routine scan, including spiral and axial mode.
	iii) The low contrast resolution should not be more than 5 mm at 0.3 %. Shoulder, Pelvis Streak Artifact suppression Software should be standard.
	iv) Noise Suppression protocols to maintain LCR at low dose should be standard.
	v) Special softwares(like mA modulationin routine & cardiac mode) to ensure dose efficiency should be standard.
	vi) Specify the CT Dose Index.
	vii) Should have iterative reconstruction technique for X Ray dose reduction.
	viii) Low dose Paediatric CT mode should be available
	ix) Patient radiation dose should be displayed on the monitor & films.
	10)Accessories:(Make and Model of all the quoted accessories should be specified)
	i) Dry chemistry camera of DPI 500 or more of any reputed make.
	ii) Lead Glass of 200 x 100 cm.
	iii) UPS with half an hour back up to run the entire CT, Computers, Dry chemistry camera, Work Stations etc.
	iv) Dual Head Pressure Injector of reputed make with 300 sets of Syringes & 1000 sets of tubings. Specify the make of Injector.
	v) Multi Para monitor with pulse oximeter of a reputed make for monitoring vitals.
	vi) Patient radiation dose should be displayed on the monitor as well as on the films
	vii) ULTRA LIGHT WEIGHT lead free aprons - 4 Nos.
	viii) Apron stand — 1 No.
	ix) Apron Hanger suitable for the supplied aprons, shields.
	x) LEAD Free Thyroid Shields – 4 nos.
	xi) Multi parametric CT performance evaluation Phantom (Slice geometry/ noise/ HCD/ LCD/ sensitometry/ MTF) ACR phantom.
	xii) Necessary QA tools essential for running CT machine.
	xiii) Indexed Flat table top compatible to Offered model should be European CE and US FDA approved. Copy of certifications should be submitted with bid.supplied linear accelerator for Radiotherapy Planning .
	xiv) Lead Free Gonadal Shields – 4 nos.
	xv) Tumour ablation system with treatment planning solution & RF generator .
	xvi) Specifications as below.
	a) Computerized needle positioning guiding tool along with radio frequency ablation system for CT guidance in tumor ablation.
	b) System should support different ablation system.
	c) Registration of the data, post processing segmentation before and after ablation should be possible
	d) Overlay of non-contrast images with contrast images to be possible.

	e) Should include radio frequency ablation generator with:
	1) Frequency at least 450KHz.
	2) To support multiprong electrode and capable of 7cm ablation in one sitting.
	3) Temperature range should be 15-125 deg C with steps of 1 deg C.
	4) RFA accessories- RFA probes, multiprong electrodes and coaxial biopsy gun of 9cm and 15cm with 20cm throw.
	11)Warranty:
	i) Warranty of the equipment including crystal & CT tube and all accessories as well as batteries of the UPS and Air-conditioning units should be for FIVE years after the satisfactory commissioning and handing over of the system. Warranty will include all the accessories as well as electronic / electrical consumables /cables / leads etc and third party items.
	ii) Rates for FIVE years comprehensive maintenance contract (CMC) after the expiry of warranty with uptime as per the tender terms. CMC will include the crystal, CT tube, batteries of the UPS, Air-conditioning units. All the accessories supplied with the main equipment as well as electronic / electrical consumables /cables / leads etc. will also be part of the CMC
	iii) Penalty clause: Penalty at the rate of RS.10,000/ per day for short falling of 95% uptime guarantee. If the machine lies non-functional for a period of more than two weeks continuously, the same penalty will be imposed even if 95% uptime clause is met with for the given calendar year.
	iv) Uptime guarantee: During warranty and the CMC period, the uptime of the system shall be at least 95% of the 365 days in a year. If downtime exceeds 5%, there shall be a penalty of Rs.10,000 / per day.
	v) Calculation of uptime
	The machine shall remain in working condition/fully functional for minimum 347days (being 95% of 365 days) during the year. For leap year, the machine shall remain in working condition/fully functional for minimum 348 days (being 95% of 366 days) during the year. Sunday and other holidays as per the institute policy would be counted calculation of uptime, if the machine was in working condition/fully functional on both days i.e the day preceding Sunday/holiday and the day succeeding Sunday/holiday. Further, routine maintenance as per scheduled agreed by user would be counted towards calculation of uptime. In case downtime is more than 5 hours on any particular day during normal working hours of the institute the same day would not count towards uptime calculation.
	vi) Calculation of down time
	Down time calculation would start from the reporting of the down time by the representative of the institute by agreed mode of communication i.e. telephonic communication or email or as per the data of the remote access of the machine(s) by supplier, if any, whichever is earlier. The down time would be calculated by deducing total uptime period as defined above from total days of the respective year. Year for the calculation of Uptime/downtime as the case may be would be considered from 01st January to 31st December of the respective year. For purpose of the downtime calculation breakdown of the machine shall be calculated as under. If no imaging is possible then its complete breakdown. If only some functions of the machine are not working in that case it shall be considered as partial breakdown equivalent to 50% of the complete breakdown for calculation purposes.
	12)Training
	i) On site application training for one month. Two doctors and four technologist at site/ reputed institute having the same CT with the same specifications for two weeks in phases
	13)Certifications:
	i) Offered model should be European CE and US FDA approved. Copy of certifications should be submitted with bid.
	ii) The quoted model should be AERB approved. Copy of AERB type approval should be submitted with bid.
	iii) DUAL ENERGY APPLICATIONS to be provided as standard. Please specify application available as standard in dual energy

	iv) Proof of availability of dual energy application must be supported with original datasheet.
	v) Dual energy application must be possible on all workstation and all fields of view. Please specify minimum FOV.
	vi) Any other application for dual energy if present in future upgrades should be part of the system without any additional cost.
	14)Accessories:
	a) X-RAY FILM ILLUMINATOR WITH COLLIMATION – SINGLE PANEL (2 NOS.)
	Specification:
	i) X-Ray Film Illuminators with collimation and luminous density control.
	ii) Suitable for viewing one 14"X17" film.
	iii) It should have high luminous density and uniform light as per DIN 6856
	iv) It should have daylight fluorescent lamps of latest design, colour temperatures of 6.200 and 6.500 Kelvin.
	v) It should have fully electronic continuous brightness control, with adjustment range of approximately 90%.
	vi) High frequency flicker free light.
	vii) Maximum Luminous density of more than 4.500 cd/sq.m.
	viii) It should have four extremely easy to move shutters for glare-free reading of any film format. Four shutters should be fitted between an external scratch-proof clear-glass pane and an internal acrylic milk glass pane.
	ix) It should have movable nylon film retaining cords with plastic slides.
	b) X-RAY FILM ILLUMINATOR WITH COLLIMATION – DOUBLE PANEL (2 NOS.)
	Specification:
	i) X-Ray Film Illuminators with collimation and luminous density control.
	ii) Suitable for viewing two 14"X17" film.
	iii) It should have high luminous density and uniform light as per DIN 6856
	iv) It should have daylight fluorescent lamps of latest design, colour temperatures of 6.200 and 6.500 Kelvin.
	v) It should have fully electronic continuous brightness control, with adjustment range of approximately 90%.
	vi) High frequency flicker free light.
	vii) Maximum Luminous density of more than 4.500 cd/sq.m.
	viii) It should have four extremely easy to move shutters for glare-free reading of any film format. Four shutters should be fitted between an external scratchproof clear-glass pane and an internal acrylic milk glass pane.
	ix) It should have movable nylon film retaining cords with plastic slides.
	c) X-RAY FILM ILLUMINATOR WITH COLLIMATION – TRIPLE PANEL (2NOS.)
	Specification:
	i) X-Ray Film Illuminators with collimation and luminous density control.
	ii) Suitable for viewing three 14"X17" film.

	iii) It should have high luminous density and uniform light as per DIN 6856
	iv) It should have daylight fluorescent lamps of latest design, colour temperatures of 6.200 and 6.500 Kelvin.
	v) It should have fully electronic continuous brightness control, with adjustment range of approximately 90%.
	vi) High frequency flicker free light.
	vii)Maximum Luminous density of more than 4.500 cd/sq.m.
	viii) It should have four extremely easy to move shutters for glare-free reading of any film format. Four shutters should be fitted between an external scratch-proof clear-glass pane and an internal acrylic milk glass pane.
	ix) It should have movable nylon film retaining cords with plastic slides.
	d) X-RAY FILM ILLUMINATOR WITH COLLIMATION – FOUR PANEL (2 NOS.)
	Specification:
	i) X-Ray Film Illuminators with collimation and luminous density control.
	ii) Suitable for viewing three 14"X17" film.
	iii)It should have high luminous density and uniform light as per DIN 6856
	iv) It should have daylight fluorescent lamps of latest design, colour temperatures of 6.200 and 6.500 Kelvin.
	v) It should have fully electronic continuous brightness control, with adjustment range of approximately 90%.
	vi) High frequency flicker free light.
	vii) Maximum Luminous density of more than 4.500 cd/sq.m.
	viii) It should have four extremely easy to move shutters for glare-free reading of any film format. Four shutters should be fitted between an external scratch-proof clear-glass pane and an internal acrylic milk glass pane.
	ix) It should have movable nylon film retaining cords with plastic slides.
	e) LED X-RAY FILM ILLUMINATOR WITH COLLIMATION – SINGLE PANEL (1 NOS.)
	Specification:
	i) LED X-Ray Film Illuminators with collimation and luminous density control.
	ii) Suitable for viewing one 14"X17" film.
	iii) It should have high luminous density and uniform light as per DIN 6856-1.
	iv) It should have LED lamps of latest design.
	v) It should have fully electronic continuous brightness control, with adjustment range of approximately 90%.
	vi) It should have flicker free light.
	vii) Maximum Luminous density of more than 4.500 cd/sq.m2.
	viii) It should have four extremely easy to move shutters for glare-free reading of any film format.
	ix) It should have thickness of not more than 70 mm.

	f) LED X-RAY FILM ILLUMINATOR WITH COLLIMATION – DOUBLE PANEL (2 NOS.)
	Specification:
	i) LED X-Ray Film Illuminators with collimation and luminous density control.
	ii) Suitable for viewing one 14"X17" film.
	iii) It should have high luminous density and uniform light as per DIN 6856-1.
	iv) It should have LED lamps of latest design.
	v) It should have fully electronic continuous brightness control, with adjustment range of approximately 90%.
	vi) It should have flicker free light.
	vii) Maximum Luminous density of more than 4.500 cd/sq.m2.
	viii) It should have four extremely easy to move shutters for glare-free reading of any film format.
	ix) It should have thickness of not more than 70 mm.
	The quoted model must have AERB type approval /NOC at the time of bid submission.
	All necessary licences for connectivity with treatment planning system, Linear accelerator and Brachytherapy machine are to be provided as standard by the vendor.

	The Turnkey Scope of Work - CT
1	The Supplier should inspect the proposed site offered by the Consignee Institute in which the CT system has to be installed and they are required to submit the plan for the complete CT Scan Centre on a turnkey basis. The scope of work includes complete Civil work, Electrical, Plumbing, Furnishing, Air-conditioning and Fire fighting for the construction of CT Scan Centre.
2	While preparing the plan, the following aspects have to be addressed.
a)	Care should be taken to provide easy negotiation of the patient stretchers/ trolleys through corridors and doors.
b)	Radiation shielding for doors, walls, windows etc.
c)	Furniture like desk, chairs, shelves etc.
d)	Patient stretcher and other furniture/ accessory to make the scan centre functional.
3.Civil work	
a)	Civil construction work including construction of brick wall if any, plastering, flooring as per the approved plan and equipment layout plan.
b)	Concrete bed at CT equipment area.
c)	Platform for unloading and shifting the CT should be provided if necessary.
d)	Cable tray, trench & channel – necessary trenches, cable tray and channels at required location would be provided.
e)	All the construction work to be done as per the final plan approved by the Consignee.
f)	Active and passive room shielding for magnetic, fringe field should be provided as per the requirement of the equipment.
a)	Flooring
1	600 x 600 mm vitrified tiles with 100mm tile skirting to match in console room, lobby and patient preparation areas, Radiologist room etc.
2	50 mm thick cement concrete flooring with Vinyl flooring in CT equipment / UPS room.
b)	Painting
1	Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in patient preparation area, Lobby area, console

	room, CT Gantry & Equipment room etc.
c)	False Ceiling
1	Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances.
Plumbing work	
1	All water pipes and fittings shall be of high density polythene of approved and standard make. The gratings shall be brass chrome plated. All plumbing accessories should be of standard make.
2	Hot water service to be provided if required.
Electrical work	
1	The supplier shall be required to specify the total load requirements for the CT scan centre including the load of air conditioning , room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the CT Scan centre area. The distribution panel shall be provided by the vendor. Few lights in each room shall be connected to the UPS to provide emergency lighting.
2	The electrical work shall include the following:
a.	Wiring – All interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
b.	Switches light and power points should be of modular type and of standard make as listed below.
c.	General lights – LED light fittings with 500 Lux Illumination
3	**AIR CONDITIONING:**
Ductable package air conditioners and split AC units may be used according to room requirement and suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface. The Air conditioning should be designed with standby provision to function 24 hours a day.	
The outdoor units of AC should have grill coverings to prevent theft and damage.	
Ventilation is required in toilet.	
2	**Environment specifications:**
a)	Relative Humidity range: To be maintained between 60% and 80% in all areas except equipment room which shall be as per requirement of the equipment.
b)	Temperature ranges: 22± 2° C in all areas except equipment room which shall be as per requirement of the equipment.
c)	Air conditioning load: The heat load calculations and maintaining the desired temperature and humidity shall be the responsibility of the bidder.
Furniture:	
a)	Revolving chairs height adjustable, medium-back with hand-rest in the Control room, Radiologist room and viewing area. – 4 NO.S
b)	Chairs for patient waiting area – Three seater (chrome plated). - 10 NO.S
c)	Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement. – 3 NO.S
d)	Drug trolleys for patient preparation area -1 NO.S
e)	Patient trolley with rubber foam mattress to be kept in the patient preparation room-2 NO.S
f)	Name boards for all rooms
g)	Tables for Workstation and Radiologist - 2 NO.S
h)	Changing rooms should have change lockers and dressing table- 1 SET
i)	Dustbins: 10 no.s
j)	Room Signage- as per requirement
k)	Any other furniture item as per requirement.

All furniture items should be of standard make as mentioned in the table below.	
Miscellaneous:	
1	Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc as required.
3	Broadband connection: for REMOTE SERVICE of CT system.
4	Fire extinguisher Dry CO2 type as required for the building safety as required
LIST OF ITEMS AND SUGGESTED MANUFACTURERS.	
ITEMS PREFERRED MAKES	
A	**FLOORING VITRIFIED TILES** -Somany, Kajaria , H&R Johnson, RAK india
B	**PAINT** - Dulux, Asian Paints , Nerolac
C	**PLUMBING** - Kohler, Jaguar , Grohe , Roca
D	**SANITARY ITEMS** - CERA, Hindware, Parryware
E	**ELECTRICAL**
1	**CABLES** - Finolex, Havells ,V-Guard
2	**SWITCHES** - Legrand, L&T, Crabtree , Roma
3	**DISTRIBUTION BOX , MCB** - Legrand, L&T, Siemens, Havels
4	**LIGHT FITTINGS** - Philips / Crompton / Wipro/syska
F	**AIR CONDINTIONING** - Daikin, Hitachi, Blue Star, Voltas,
G	**FURNITURE** - Hermen Miller , Godrej , Featherlite,Geeken

Please also refer to the Technical specification for any other accessories.

All other terms and conditions of the tender enquiry document shall remain unchanged.
Prospective bidders are advised to regularly visit HSCC website/ CPP as corrigendum /amendments etc. if any, will be notified on this portal only, no separate advertisement will published in the news papers.

Sr. Chief General Manager-I, HSCC (I) Ltd
For & on behalf of Director CNCI, Kolkata