Autoclavable at 121°C fully assembled.
Supplied with 5 bottle adapters
NABL Calibration certificate preferred

15. Electrophoresis Apparatus with Power Supply for Paper/ PAGE/ AGAROSE. - 6 Nos.

Chambers – total 6

1. **For Paper electrophoresis, horizontal – 2 Nos.**

Paper electrophoresis system, cellulose acetate system suited for standard and wet cellulose paper electrophoresis, support adjustable for different strip lengths, can adjust strip dimensions of upto 24X20 cm, Acrylic made, with lid, platinum electrodes, red and black connecting cords,

Suitable for standard and wet cellulose acetate electrophoresis of haemoglobin, serum proteins, isoenzymes, urine proteins, lipoproteins and glycoproteins, can adjust multiple gel sizes available commercially

2. **For gel (agarose) electrophoresis – 2 Nos.**

a. **Small system - One**

Acrylic made, Inner tank 215 x 141 x 55 mm, with lid
Trays:
130 x 130 mm - 1 No.
130 x 65 mm - 2 Nos.
65 x 60 mm - 4 Nos

No. of combs:
13 Well Analytical Acrylic Comb 1.5 mm thick x 1 No.
8 Well Analytical Acrylic Comb 1.5 mm thick x 4 Nos.
3 Well Preparative Acrylic Comb 3 mm thick x 1 No

Universal gel casting tray, Platinum electrodes, Red and black connecting cables

b. **Large system – One**

Acrylic made, Inner tank 39.5 X 23 X 9 cm, with lid
Trays:
200 x 100 mm - 1 No.
200 x 200 mm - 1 Nos.
200 x 250 mm - 1Nos

Combs: 20 well (1 mm thick) X 2 Nos.
2 gel casting dams, Platinum electrodes, Red and black connecting cables

3. **Vertical electrophoresis (PAGE)**

a.Mini system - One No.

Vertical dual mini Gel, Acrylic made, with lid, Gel Size : 8 x 7 cms x 2,
Upper buffer tank dimension : 70 x 70 x 43 mm,
Lower buffer tank dimension : 150 x 130 x 115 mm,

Combs :
7 Well Teflon Comb 0.5 mm-2 Nos.
7 Well Teflon Comb 1 mm-2 Nos.

Teflon Spacers :

0.5 mm Teflon Spacers - 4 Nos.
1 mm Teflon Spacers - 2 Nos.

Glass plate : Notched and Rectangular 2 sets of glass plates, 2 sets of Clamp and screws, Water circulation, Gel casting unit , red and black connecting cables, Platinum electrodes.

b. Large system – One No.

Acrylic made, with lid, Dual gel system, Gel Size : 16 x 20 cms x 2 gels,
Upper Buffer Tank Dimension : 200 x 75 x 20 mm
Lower Buffer Tank Dimension : 270 x 100 x 115 mm
Combs : 20 Well Teflon Comb 1 mm-2 Nos.
Teflon Spacers : 1 mm Teflon Spacers 6 Nos.
Red and black connecting cables, Platinum Electrodes, Water Circulation,
Glass Plate : Notched and Rectangular 2 sets.
Clamp and Screws : 4 sets.
Gel Casting Unit

Power supplies – One
Output range upto 500 V, adjustable in 1 V steps, 0.01–2.5 A, adjustable in 0.001 A steps, Upto500 W, fully adjustable in 1 W steps.
Modes- programmable, constant voltage, constant current, or constant power with facility for auto crossover
Terminals- 4 pair of recessed banana jacks in parallel
Timer control of 1-99 hr 59 min, fully adjustable
Pause/resume function.
Programmable- memory for methods storage and real time clock.
Automatic recovery after power failure
LCD Display
Proper safety and electrical compliance.
Safety: No-load detection, sudden load change detection, ground leak detection, overload/short circuit protection, overvoltage detection, input line protection, auto power-up after power failure.
Input power suited to Indian power supply of 110–240 V AC, 50/60 Hz
Operating conditions 0–40°C, 0–90% humidity
Appropriate CE/ ISI etc certification

16. Fully Automated Spectrophotometer - 1 No.

1. Wavelength range: 190 to 1100 nm.
2. Spectral bandwidth: 0.5 to 4 nm.
3. Light Source(s) 20-W halogen/Xenon lamp and deuterium lamp built-in light source auto position adjustable.
4. Detector Type: Silicone photodiode.
5. Wavelength Accuracy: ±0.5 nm for entire range.
6. Spectral Resolution: 0.1nm increment.
7. Absorbance Precision: Absorbance: -4 to4 Abs, Transmittance: 0% to 400%, accuracy: ±0.01 Abs at 0.5 Abs, ±0.008 Abs at 1.0 Abs.
8. Photometric System: Double bean optic.
9. Wavelength Scanning speed: 3600 nm / min.
10. Power requirement: 220 to 240 V, AC 50Hz.
11. Environmental requirement: Temp 15 to 40°C. Humidity: 30-70%.
12. Output device: UV PC format.
13. PC Compatibility: provided with software. External control possible via USB.
14. Should provide Quartz cuvette: 1ml and 3ml Capacity.
15. Should provide glass cuvette 1ml and 3ml capacity.
16. Facility for small sample volumes (of 50µL, 25µL and 5µL micro-volume cells) measurement with required accessory should be included
17. Sample detection for RNA and Protein.
18. Maximum sample concentration: 750-1000 ng / microlitre of dsDNA.
19. Measurement Time < 5 seconds.

(11)

20. PC with software Windows XP / 2007 or inbuilt LCD Screen.
21. System should be US FDA or European CE or BIS approved

17. Sprit Lamp - 50 Nos.

Spirit lamp should be of top quality made up of premium raw material with a excellent functioning and durability

18. Charts - Qty as per list.

List Enclosed at Annexure "A" - given below:

ANNEXURE A

Charts **- Qty as per list.**

List of charts & models required for the Department of Biochemistry

Sr. No.	Title	Quantity
1	Isomerism- Cis-trans-isomers, Conformers, Optical isomers, The aconitase reaction	01
2	Biomolecues I - Important classes of compounds	01
3	Biomolecues II- Acetyl CoA	01
4	Reaction Kinetics- Activation energy, Reaction rate, Reaction Order	01
5	Acids and bases-Acids and bases, pH values in the body, Buffers	01
6	Redox Processes-Redox Reactions, Reducing equivalents, Biological redox system.	01
7	Chemistry of suger - Reaction of the monosaccharides, Polarimetry, Mutarotation	01
8	Glycosaminoglycans and Glycoproteins- Hyaluronic acid, Oligosaccharide in immunoglobuling (IgG),Glycoprateins	01
9	Steroid structure – Steroid building blocks, 3D structure, Thin-layer Chromatography	01
10	Steroid overview – sterols, Bile acids, Steroid hormones	01
11	Chemistry and properties – Amino acids: functions, Optical activity, Dissociation curve of histidine B27	01
12	Peptide bonds – Peptide bonds, Reasonance, Peptide nomenclature.Conformmation space of the peptide chain	01
13	Secondary structure – Helix, Collagen Helix Pleated-sheet structure, B- Turns	01
14	Molecule models : Insulin – Structure of insulin, Insulin (Monomer)	01
15	Isolation and anyalysis of proteins – Salt precipitation, Dialysis,Gel filtration, SDS gel electrophoresis	01
16	Base and nucleotides – Nucleic acid bases, Nucleosides, Nucleotides, Oligonucleotides, Polynucleotide	01
17	RNA- Ribonucleic acids (RNAs), Transfer RNA (tRNA)	01
18	Molecular model: DNA and RNA – DNA: Conformation, RNA	01
19	Enzyme Kinetics I – Michaelis Menten kinetics, Isosteric and allosteric enzymes	01
20	Inhibitors – Types of inhibitor, Koinetics of inhibition	01
21	Enzymatic analysis – Principle of spectrophontometry, Assay of lactate Dehydrogenase activity, Enzymatic determination of glucose	01
22	Allosteric regulation – Aspartate carbamoyltransferase : reaction, Kinetics,R and T conformation, Structure of a dimer,	01
23	Transcription Control – Functions of regulatory proteins, lactose operon	01
24	Hormonal Control – Principles of hormone action, Hormonal regulation of glucose metabolism in the liver	01
25	ATP – ATP: structur, Hydrolysis energies, Types of ATP formation	01
26	Energetic Coupling – Energetic coupling, Substrate level phosphorylation	01
27	Tricarboxylic acid cycle: reactions- Tricaboxylic chain, Organization	01
28	Respiratory Chain- Copmonents of the respiratory chain, ATP synthase	01
29	ATP synthesis – Redox systems of the respiaratory chain, ATP sysnthase	01
30	Regulation- respiratory control, Uncoupers	01
31	Glycousis – Glycolysis: balance, Reactions, Energy profile	01
32	Pentose Phosphate Pathway – Pentose phosphate pathway : oxidative part, Reactions,	01
33	Gluconeogenesis - Gluconeogenesis -	01
34	Glycogen metabolism - Glycogen metabolism, Glycogen balance.	01
35	Regulation- Regulation of carbohydrate metabolism, Fructose 2, 6-bisphosphate,	01
36	Diabetes mellitus – Insulin Biosynthesis, Effects of insulin deficiency	01
37	Over view – Fat medtabolism.	01
38	Fatty acid degradation – Fatty acid degradation : B- Oxidation, Fatty acid	01
39	Fatty acid synthesis – Fatty acid synthesis	01
40	Biosynthesis of Cholesterol – Cholesterol biosynthesis	01
41	Protein Metabolism : over view – Protein metabolism overview	01
42	Transmination and Deamination – transamination and Deamination	01
43	Amino acid degradation - Amino acid degradation : overview, Deamination.	01

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44	Urea Cycle – Urea cycle	01
45	Nucleotide degradation - Nucleotide degradation Hyperruricemia(gout)	01
45	Purine and pyrimidine biosynthesis – Components of nucleobases, Pyrimidine and purine synthesis	01
46	Heme bio sysnthesis – Heme biosynthesis,	01
47	Heme degradation – Degradation of heme groups.	01
48	Structure of cell – Comparison of prolaryotes and eukaryotes, Structure of an animal cell	01
49	Structure and Components – Structure of the plasma membrane	01
50	Transport Processes – Permeability of membranes, passive and active transport, Transport processes	01
51	Transport proteins - Transport mechanisms, Glucose transporter Glut – 1, Aqyaporin-1, Sarcoplasmic Ca+2 pump.	01
52	Iron channels – Voltage-gated Na +channel in Streptomycin lividans	01
53	Membrance receptors – Principle of receptor action,Insulin receptor, 7-Helix receptors, T- cell receptor.	01
54	Protein sorting – protein sorting , Translocation signals, Exocytosis	01
55	Protein synthesis and maturation –Protein in the rough endoplasmic reticulum, protein glycosylation	01
55	Protein maturation – Protein folding in the rER, Chaperones and chaperonins, protein import in mitochondria	01
56	Replication – Mechanism of DNA polymerases, Replication in E coli,	01
57	Transcription – Transcription and maturation of RNA: overview, Organization of the PEP- CK gene, Process of transcription	01
58	Transcriptional Control – Initiation of transcription, Regulation of PEP-CK transcription	01
59	RNA Maturation – 5` and 3` modification of m RNA: Splicing of h nRNA Spliceosome	01
60	Amino acid activation – The genetic code, Amino acid activation Asp-tRNA- Ligase (Dimer)	01
61	Translation 1 : initation – Structure of eukaryotic ribosomes, Polysome Initiaition of translation in E Coli	01
62	Translation 11: elongation and termination – Elongation of protein biosysnthesis in E Coli	01
63	Antibiotics – Antibiotic: overview, Intercalators, C Penicillin as suicide substrate	01
64	Mutation and Repair- Mutagenic agents, Effects, Repair mechanisms	01
65	DNA cloning - Restriction endonucleases, DNA cloning	01
66	DNA sequencing – Gene libraries, Sequencing of DNA,	01
67	PCR and protein expression – Polymerase chain reaction (PCR), DNA electrophoresis, Over expression of proteins	01
68	Genetic engineering in medinice – DNA fingerprinting, Diagnosis of vira DNA using RT-PCR, Gene therapy.	01
69	Hemoglobin - Hemoglobin structure, Hemoglobin allosteric effects	01
70	Iron metabolism – Distribution of iron, Iron metabolism	01
71	Acid-base balance – Hydrogen ion concentration in the blood plasma Acid-base balance,Buffers system in the plasma	01
72	Immune response – Simplified scheme of the immune response	01
73	T-cell activation – Antigen receptors, T cell activation,	01
74	Complement system- Complement activation	01
75	Antibodies – domain structure of I mmunoglobulin G, Classes of immunoglobulins	01
76	Monoclonal antibodies – immunoassay – Monoclona antibodies Immunoassay	01
77	Carbohydrate metabolism – Gluconeogenesis : overview, Fructose and Galactose metabolsm	01
78	Lipid metabolism – lipid metabolism Biosynthesis of ketone bodies	01
79	Bile acids – Bile acids and bile salts, Metabolism of bile salts,	01
80	Cytoschrome P450 systems – Cytochrome P450 – Dependent monooxygenases : reactions	01
81	Urine-Urine, Organic constituents , inorganic constituents,	01
82	Function in the acid-base balance – Proton secetion Ammonia excretion	01
83	Renal hormones – renal hormones, Renin angiotensin system,	01
84	Muscle contraction – Organization of striated muscle, Mechanism of muscle contraction	01
85	Muscle metabolis 1 Cori and alanine cycle, Protein and amino acid metabolism	01
86	Muscle metabolis 1 – Cori and alanine cycle , Protein and amino acid metabolism.	01
87	Calcium metabolism. – Function of Calcium, Bone remodelling, Calcium Homeostasis	01
88	Collagens – Structure of collagens , Biosynthesis,	01
89	Extracellular matrix – Extracellular matrix, Fibrronectins, Proteoglycans	01
90	Lipid – soluble vitamins – Vitamin supply, Lipid-soluble vitamins	01
91	Water- soluble vitamins 1 – Water- soluble vitamins I	01
92	Water- soluble vitamins 2 – Water- soluble vitamins II	01

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93	Basics – A. Hormones: overview, A. Hormonal regulation system	01
94	Metabolism of steroid hormones – Biosynthesis of steroid hormones Inactivation of steroid hormones	01
95	Metabolism of Peptide Hormones – Biosynthesis, degradation and inactivation.	01
96	Mechanisms of action – Mechanisms of action, Signal transduction	01
97	Second messengers – Cyclic AMP, Inositol 1,4,5-trisphospate and diacylglycerol, Calcium irons	01
98	Signal cascades – Insulin: signal transduction, Nitrogen monoxide (NO) as a mediator,	01
99	Apoptosis – Cell proliferation and apoptosis, Regulation of apoptosis	01
100	Oncogenes – Proto-oncogenes: biological role, Oncogene products: biochemical functions.	01
101	Sanger Fredrick	01
102	Krebs, Sir Hans Adolf	01
103	J.D. Watson & H.F.C. Crickk	01
104	Jacob & Monod	01
105	Lehninger	01
106	Carl Neuberg, Father of Biochemistry	01
107	B.C. Guha Father of Biochemistry in India	01
108	Carl Ferdinand Cori	01
109	Arthur Karnberg	01
110	Thomas B.Kornberg.	01
111	Maude Menten.	01
112	Leonor Michaelis	01
113	Linus Pauling.	01
114	Raj Shankar.	01

NOTE:

Note:1. The portraits of all the scientists (***Sr. No. 101 to 114***) should preferably be provided on a laminated, wall mountable board. Each portrait should also be accompanied with the following details below each of the Photograph:

- Name of scientist
- Birth year – Death year (if applicable)
- A brief mention of their most significant contribution in the field of Human Physiology (upto 30 words or less).
- All charts must be quoted separate for each charts

Following details should be mentioned above each of the Photograph:

"**DEPARTMENT OF BIOCHEMISTRY, KCGMC, KARNAL**" in single line.

All portrait Charts should be thick Laminated & PVC Mounted & must be quoted separately for each charts.

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Annexure-II

Price bid

Sl No.	Name of Items	Model/Make Specification	Qty(Nos)	Unit Rate (Rs.)	CST/VAT/(if any tax) (Rs.)	Unit cost Incl. Tax(Rs.)	Total (Rs.)

I accept all terms and conditions of the above Invitation of Quotation

Authorized signatory
Name, designation and Sealed