Section-1 GENERAL INSTRUMENTS

(For Science, Electronics, Laser, Optics and Research Lab)

1. Digital Picoammeter, Model PM-100

Application : Measurement of low current down to 1 pA
Range : 1nA to 100 µA full scale in 6 decade ranges with 100% over ranging (1 pA minimum)
Display : 3 ½ digit, 7 segment, LED display
Input : Through UHF Connector
Accuracy : ± 0.25% ± 1 digit
Power : 220 V ± 10%, 50 Hz

2. Digital Nanoammeter, Model NM-100

Application : Measurement of low current down to 100 pA
Range : 100 nA to 100µA full scale in 4 decade ranges with 100% over ranging (100 – pA minimum)
Display : 3 ½ digit, 7 segment, LED display
Input : Through Amphenol Connector
Accuracy : ± 0.25% ± 1 digit
Power : 220 V ± 10%, 50 Hz

3. Digital Microammeter, Model DMM-01

Application : Measurement of low current down to 1nA
Range : 1µA to 1000µA full scale in 4 decade ranges with 100% over ranging
Display : 3 ½ digit, 7 segment, LED display
Accuracy : ± 0.25% ± 1 digit
Power : 220 V ± 10%, 50 Hz

4. D.C. Microvoltmeter, Model MV-02

Application : Very low D.C. voltage measurement
Range : 1 mV, 10 mV 100 mV, 1 V, 10 V with 100% over ranging
Resolution : 1 µV
Accuracy : ± 0.25% ± 1 digit
Stability : ± 1 digit
Input Impedance: >1000 MΩ on all range (except 10 MΩ at 10 V range)
Display : 3 ½ digit, 7 segment, LED display
Power : 220 V ± 10%, 50Hz

5. A.C. Millivoltmeter, Model ACM-203 (True rms)

Application : General purpose, indispensable to any electronic lab
Range : 20 mV, 200 mV, 2 V, 20 V FSD
Response : 10 Hz to 150 KHz
Accuracy : ± 0.25% of FSD
Display : 3 ½ digit, 7 segment, LED display
Oscll. Output : 0-1V continuously variable
Frequency : 1 KHz Sine wave fixed
Power : 220 V ± 10%, 50Hz

6. A.C. Millivoltmeter, Model ACM-20 (True rms)

Application : General purpose, indispensable to any electronic lab
Specifications : Same as in item No. 5 above except built-in oscillator

7. Digital Gaussmeter, Model DGM-20

Application	:	Measurement of magnetic field from 1 Gauss to 20 K Gauss with convenience & enhanced resolution
Range	:	0-2 K Gauss and 0-20 K Gauss
Accuracy	:	± 1% of the reading ±1 digit
Metering	:	3 ½ digit, 7 segment, LED display
Element	:	Hall probe In-As (transverse type)
Power	:	220 V ± 10%, 50 Hz
Sp. Feature	:	Indicates direction of the magnetic field

8. Gaussmeter with axial type hall probe also available with same specifications for transverse field measurement.

9. Digital High voltage Power Supply, Model DHV-15

Application	:	High voltage source for photomultiplier tubes and other radiation detector
Output Polarity	:	+ve or –ve as required
Output	:	0 to 1500 V continuously variable
Regulation	:	± 0.05% for no to full load
Stability	:	0.02% for no to full load
Current	:	1 mA (max.)
Display	:	3 ½ digit, 7 segment, LED display
Power	:	220 V ± 10%, 50 Hz
Protection	:	Protected against over load and short circuit by current limiting technique

10. Power Supply, Model PS-20

Application	:	General purpose low cost laboratory power supply
Output	:	0-20 V continuously variable with coarse & fine control
Current	:	1Amp or 2 Amp as required
Regulation	:	± 0.05% for no to full load
Stability	:	± 0.05% for no to full load
Display	:	Separate digital display for both voltage & current
Protection	:	Protected against over load and short circuit
Power	:	220 V ± 10%, 50 Hz

11. Power Supply Fixed Output, Model FPS-20

Application	:	General purpose low cost power supply ideally suited for analog and digital IC's
Output	:	+ 5 V, -5 V, +12 V and -12 V fixed voltage
Current	:	300 mA (max.) for each
Power	:	220 V ± 10%, 50 Hz

12. Function Generator Model FG-200

Wave	:	Sine, Triangle & Square with TTL output
Frequency	:	2 Hz To 200 KHz in 6 decade ranges
Output	:	15 V p-p into 600 ohm
Accuracy	:	± 5%
Power	:	220 V ± 10%, 50 Hz

13. A.F. Oscillator, Model AF-10

Wave	:	Sine & Square wave
Frequency	:	20 Hz to 200 KHz in 4 decade ranges
Output	:	0-10 V in 5 decade ranges
Accuracy	:	± 5%
Power	:	220 V ± 10%, 50 Hz

14. Electromagnet, Model EMH-20 (H Shape)

Application	:	General purpose research laboratory electromagnet
Pole pieces	:	100 mm diameter tapered to 50 mm (inner side) flat for uniform field in a large area
Field	:	20 K Gauss at 10 mm air gap. The air gap is continuously variable upto 100 mm with two-way knobbed wheel, screw adjusting system
Coils	:	Two (wound on non-magnetic aluminum former)
Power	:	0-180 Volt D.C., 6 Amp. (max.)

15. Power Supply, Model PS-6

Application	:	Suitable for electromagnet EMH-20
Output	:	0-240 Volts D.C. continuously variable
Current	:	6 Amp. (max.)
Ripple	:	Less than 1%
Metering	:	4½" good quality moving coil meter
Power	:	220 V ± 10%, 50 Hz
Protection	:	Fuse in input and output circuit

16. Electromagnet, Model EM-11 (U Shape)

Application	:	General purpose laboratory electromagnet
Pole Piece	:	75 mm diameter flat
Field	:	11 K Gauss at 10 mm air gap. The air gap is continuously variable upto 70 mm with two way knobbed wheel, screw adjusting system
Coil	:	Two (wound on non-magnetic aluminum former)
Power	:	0-90 volt D.C., 3.5 Amps. (max.)

17. Constant Current Source, Model CS-11 (IC Regulated)

Application	:	Suitable for electromagnet EM-11
Current	:	Smoothly adjustable, 0-3.5 Amp. per coil
Load Regulation	:	± 0.2% for no to full load
Line Regulation	:	± 0.2% for 10% mains variations
Display	:	3 ½ digit, 7 segment, LED display
Power	:	220 V ± 10%, 50 Hz
Protection	:	Protected against over load and short circuit

18. Electromagnet, Model EM-10 (U-Shape)

Application	:	Low cost electromagnet specially designed for susceptibility (Quinck's tube method) experiment
Pole pieces	:	50 mm tapered poles
Field	:	10 K Gauss at 10 mm air gap. The air-gap is continuously variable upto 50 mm with two way knobbed wheel, screw adjusting system
Coils	:	Two (wound on nonmagnetic aluminum former)
Power	:	0-40 volt D.C., 4.0 Amp. (max.)

19. Electromagnet, Model EM-07 (U-Shape)

Application	:	Low cost electromagnet generally used for Hall Effect, magnetoresistance and other laboratory experiments
Pole pieces	:	50 mm diameter flat
Field	:	7 K Gauss at 10 mm air-gap. The air gap is continuously variable upto 50 mm with two way knobbed wheel, screw adjusting system
Coils	:	Two (wound on nonmagnetic aluminum former)
Power	:	0-36 volt D.C., 4.0 Amp. (max.)

20. Constant Current Source, Model CS-07 (IC Regulated)

Application	:	Suitable for electromagnet EM-10 & EM-07
Current	:	0-3.5 Amp or as required
Load Regulation	:	$\pm$ 0.2% for 10% mains variation
Line Regulation	:	$\pm$ 0.2% for no to full load
Display	:	3 ½ digit, 7 segment, LED display
Power	:	220V $\pm$ 10%, 50 Hz
Protection	:	Protected against over load and short circuits

21. Photo-multiplier Tubes (PMT) 931-A (RCA), IP21 and IP28

22. PMT Housing with Biasing Circuit (Positive ground)
suitable for 931-A, IP 21 and IP 28 with connecting coaxial cables.

23. Helium Neon Laser (Red)

Application	:	A monochromatic light source for laser, optics and other laboratories
Output power	:	1 mW/2 mW/ 5mW as required
Wavelength	:	632.8 nm (Red)
Mode	:	Linearly polarised or randomly polarised
Life	:	20,000 hours
Power	:	220 V $\pm$ 10%, 50 Hz

24. Laser Diode

Output Power	:	3 to 5 mw
Wavelength	:	650 nm (Red)
Power	:	220 V $\pm$ 10%, 50 Hz

25. Laser Detector

Application	:	Sensing the intensity of laser beam
Type	:	Composite silicon laser detector mounted in Al. case

26. Laser Pointer (Pen type) 670 nm Red

27. Lab. Jack for Laser (with M6 hole on 25 mm centers at the top)

Size (cm)	:	15x10	20x12	30x20
Height (cm)	:	10	15	20

28. Laser Stand : Simple stand in rectangular shape with adjustable height and screw leveling.

29. Laser Goggles (Imported and Indian)

Application	:	Protection of eye against laser beam

30. Polarimeter
Fitted with biquartz half shade device and workable on ordinary light

31. Traveling Microscope

Application	:	Suitable for Susceptibility, Cornu's & other lab exp.
Specifications	:	Horizontal & vertical scale motion or horizontal, vertical & lateral motion. The bed is of heavy cast iron base, fitted with leveling screws, vernier reading to 0.01 mm.

32. Polarizer and Analyzer (Pointer & Vernier Type)
Fitted with circular scale graduated in 360° with provision to fit on the objective of telescope or collimeter of spectrometer & on optical bench.

33. Optical Mounts

(a) Precision X-Y-Z Translation Stage: X-Y motion by micrometer & Z by thumb wheel with heavy base suitable to mount on board/plane table.

(b) Precision X-Y-Z Translation Stage: with Z motion by micrometer

(c) Precision X-Z Translation Stage: Same with X-by micrometer and Z by thumb wheel

(d) Highly Precision Translation Stage: (Item no. a to c above) with imported micrometer or screw.

(e) Rotational Stage with coarse & fine movement

(f) Post mounts, thumb wheel mount,

(g) V grooves & clamps

(h) Self centering holders & mounts for lenses, slits and M.O. etc

34. Optical Components

(a) Slits *(for Optical Experiments)*
(i) Variable single and double slit with micrometer movement
(ii) Fixed single & double slit for single slit experiment with laser

(b) Lenses *(for Laser Experiments)*

Size (mm)	: 09	12	18	18	18	18
Focal length (mm)	: 20	30	40	100	150	200

(c) Spectrometer Prisms

Specification	: DF	EDF	DEDF
Size (mm)	: 25x25	32x32	38x38

(d) Calcite and Quartz Prism
Type : (i) Optic axis Parallel to base
: (ii) Optic axis Parallel to reflecting edge
Size (mm) : 12x12, 15x15 and 18x18

(e) Diffraction Grating (with 15000, 2500, 1000, 500 LPI)
(i) Hilger and watts original (made in U.K.)
(ii) Hilger and Watts (Type Indian)

(f) Optical Filters
(i) Optical Glass filters (ii) Optical Interference filters (imported)

(g) Quarter and Half Wave Plate (made of Quartz only)

(h) Polarizing Sheet

(i) Microscope Objectives : 10X, 20X, 40X

(j) Iris Diaphragm with mount

35. Light Sources

(a) Tungsten Halogen Lamp: with housing & built in power supply

(b) Sodium Vapour Lamp (Imported) & Leak Proof Transformers
(i) 35 Watts (ii) 55 Watts

(c) Mercury Vapour Lamp & Chokes
(i) 80 Watts (ii) 125 Watts

36. Honey Comb Breadboards

Application : Suitable for taking measurement in vibration free environment in optics laser laboratories
Size : 1x1 feet to 4x8 feet in 16 different sizes
Thickness : M 6 tapered hole with 25 mm centres on top