Electronics Mechanic

Sr No.	Specification Of Items	Qty
1	Connecting Screwdriver 100mm	10 Nos.
2	Neon Tester 500V	06 Nos.
3	Screw Driver Set (Set of 5)	10 Nos.
4	Insulated combination Plier 150mm	06 Nos.
5	Insulated Side cutting pliers 150mm	08 Nos.
6	Long Nose Pliers 150mm	06 Nos.
7	Soldering Iron 25W 240V	10 Nos.
8	Electrician Knife	06 Nos.
9	Tweezer 100 mm	10 Nos.
10	Digital Multimeter **Technical Specifications:** ▪ DC Voltage range : 400mV, 4V, 40V, 400V, 1000V ▪ Accuracy : +(0.5% + 4 Digit) ▪ DC Current range : 400microA, 4000microA, 40mA, 400mA, 10A ▪ Accuracy : +(1% + 6 Digit) ▪ AC Voltage range : 400mV, 4V, 40V , 400V, 750V ▪ Accuracy : + (0.8% + 6 Digit) ▪ AC Current range : 400microA, 4000microA, 40mA, 400mA, 10A ▪ Accuracy : +(1.5% + 10 Digit) ▪ Resistance range : 400ohm, 4Kohm, 40Kohm, 400Kohm, 4Mohm, 40Mohm ▪ Accuracy : + (0.8% + 4 Digit) ▪ Capacitance range : 4nF, 40nF, 400nF, 4microF, 200microF ▪ Accuracy : + (2.5% + 6 Digit) ▪ Frequency : 100Hz, 1000Hz, 10kHz, 1MHz, 30MHz ▪ Accuracy : +(0.5% + 4 Digit) ▪ Temperature : -40OC ~ 1000OC ▪ Accuracy : +(0.8% + 4 Digit) ▪ Input impedance : 10Mohm ▪ Sampling Rate : 3s ▪ AC Frequency Response :40 ~ 400Hz ▪ Power requirement : Battery AA, 1.5V x 2nos ▪ Weight : 400g Approx. **Standard Accessories :** Probes, Batteries, Instruction manual	10 Nos.
11	Soldering Iron Change able bits 15W	06 Nos.
12	De- Soldering Pumps	10 Nos.

B.General Machinery Shop Outfit

Sr No.	Name of items	Qty
1	Steel Rules 300mm	04 Nos.
2	Steel Measuring Tape – 3 m	04 Nos.
3	Tools Maker Vice 100mm (clamp)	01 Nos.
4	Tools Maker Vice 50mm (clamp)	01 Nos.
5	Crimping Tool (Pliers)	02 Nos.
6	Megneto Spanner set	02 Nos.
7	File Flat 200mm Bastrad	02 Nos.
8	File Flat 200mm Second Cut	02 Nos.
9	File Flat 200mm Second Cut	02 Nos.
10	100mm Flat Pliers	04 Nos.
11	100mm round nose plier	04 Nos.
12	Scribes Straight 150mm	02 Nos.
13	Hammer ball Pen 0.5 Kg	01 Nos.
14	Allen Key Set (set of 6 Nos.)	01 Nos.
15	Tubular Box spanner (set of 6 Nos.)	01 Set
16	Magnifying Lenses 75mm	02 Nos.
17	Continuity tester	06 Nos.
18	Hacksaw frame adjustable	02 Nos.
19	Cold chisel 20mm	01 No
20	Scissors 200mm	01 No
21	Handsaw 450mm	01 No
22	Hand Drill machine	02 Nos.
23	First Aid Kit	01 No
24	Fire Extinguisher	02 Nos.
25	Bench Wise	01 N
26	Dual DC regulated Power Supply 30-0-30V,2Amp **Technical Specifications:** Variable Output	04 Nos.

	Dual Output Voltage 0 ~ +30VDC Dual Output Current 0 ~ 2A Fixed Output 5VDC/2A Stability 0 to nominal value continuously variable Voltage: <0.01% +2mV Load: < 0.01% +2mV Recovery Time < 100ms Ripple & Noise < 1mV rms (efficient value) Temperature Factor < 300 PPM / oC 0 to nominal value Continuously Current Load Stability < 0.2% +3mA Source Regulation < 0.05% +10mV Load Regulation < 0.05% +10mV Digital Display 3 Digit voltage & current display Accuracy +1%, +1 Digit Mode Independent, Series and Parallel modes Power requirement : 220 VAC +10% , 50 Hz Weight : 8.0Kg Approx. Dimensions (mm) : 240(L) x 250(B) x 150(H) **Standard Accessories :** Power cable, Instruction manual	
27	DC Regulated Power supply 0-24V, 1Amp **Technical Specifications:** Variable Output Output Voltage 0 ~ 30VDC Output Current 0 ~ 2A Source Regulation < 0.05% +10mV Load Regulation < 0.05% +10mV Ripple & Noise <1mV (rms) Digital Display 3 digit voltage & current display Accuracy +1%, +1 Digit Fixed Output Output Voltage Fixed 5VDC/3.3VDC Output Current 1A Source Regulation <5mV Load Regulation <15mV Ripple & Noise <2mV (rms) Power requirement : 220 VAC +10% , 50 Hz Weight : 4.0Kg Approx. Dimensions (mm) : 120(L) x 250(B) x 150(H) **Standard Accessories :** Power cable, Instruction manual	02 Nos.
28	LCR Meter (Digital) **Features :** Professional grade digital LCR meter Automatic Zero adjustment Display 3.5 digit LCD display (2000 Counts) Data Hold facility & MAX Hold facility Polarity, Automatic, positive implied, (-) negative polarity indication Over range Indication, OL' or '-OL' is displayed Measurement rate, 2.5 times per second, nominal Diode Test, Capacitance Test, Resistance & Inductance **Technical Specifications :** Capacitance range : 200pF, 2nF, 20nF, 200nF, 2microF, 20microF, 200microF, 1000microF, 2000microF Accuracy : +(1.0% + 3 Digit) 200pF, 2nF, 20nF, 200nF : +(2.0% + 3 Digit) 2microF, 20microF, 200microF : +(3.0% + 3 Digit) 1000microF : +(5.0% + 10 Digit) 2000microF Test frequency : 1000Hz on 200pF ~ 2microF : 100Hz on 20microF ~ 200microF : 10Hz on 2000microF	01 No

	Overload protection : 0.1A/250V fast blow fuse Resistance range : 20ohm, 200ohm, 2kohm, 20kohm, 200kohm, 2Mohm, 20Mohm Accuracy : +(1.0% + 10 Digit) 20ohm : +(0.3% + 3 Digit) 200ohm : +(0.3% + 1 Digit) 2kohm, 20kohm, 200kohm, 2Mohm : +(2.0% + 2 Digit) 20Mohm Open circuit voltage : 6.5VDC on 20ohm ~ 200ohm : 1.2VDC on other ranges Overload protection : All ranges 25VDC or AC rms Inductance range : 200microH, 2mH, 20mH, 200mH, 2H, 20H, 200H Accuracy : +(3.0% + 3 Digit) 200microH, 2mH, 20mH, 200mH : +(5.0% + 10 Digit) 2H, 20H, 200H Test frequency : 1000Hz on 200microF ~ 2H : 100Hz on 20H ~ 200H : 10Hz on 2000microF Diode test : LED, Microwave Diode, Zener Diode Test current : 3mA Approx. Open circuit voltage : 8VDC Accuracy : +(10% +10 Digit) Overload protection : All ranges 25VDC or AC rms Power requirement : Battery 9V (Included) **Standard Accessories :** Probes, Batteries, Instruction manual	
29	CRO Dual Trace 20Mhz Features : DC ~ 20MHz With component tester Dual channel/Dual tracing, X-Y mode 6" display cathode ray tube, sensitivity triggering up to 1mV/divison TV synchronous separation circuit to observe stable TV signal Hold-Off function Technical Specifications : CRT : 6” Rectangular screen with internal graticule, 8 x 10 Div (1Div=1cm) Vertical Deflection Vertical Operation Mode : CH1, CH2, ADD, ALT, CHOP,CH2 INV Sensitivity : 5mV/div to 20V/div +3%, 1mV/div to 4V/div +5% (x5),12 steps Rise time : <17.5ns <50ns Input impedance : 1Mohm +3% / 25pF +5pF Max. Input voltage : 400V (DC+AC p-p) at 1kHz Input coupling : AC, DC, GND Horizontal Deflection Sweep time : 0.2micro s to 0.5s/div +3% Sweep expansion : x10 Max. Sweep time :20ns/Div Trigger System	02 Nos.

	Triggering mode : Auto, NORM, TV-V, TV-H, Lever lock Trigger source : VERT,CH1, CH2, LINE, ALT Trigger coupling : AC Trigger slop : "+" or "-" Trigger sensitivity : 5Hz ~ 10MHz 10MHz ~ 20MHz CH1, CH2 - 1Div 1.5Div ALT - 2.0Div 3.0Div Ext - 200mV 300mV TV sync pulse >2Div or 0.5V (Ext) External Trigger : Input impedance - 1Mohm+3%, 25pF+5pF Max. Input voltage - 400V(DC+AC peak)at1kHz X-Y Phase Difference : <3O, DC-50kHz Calibration waveform : 1kHz square wave, 2Vp-p +2% Power requirement : 220 VAC +10% , 50 Hz Weight : 8.0Kg Approx. Dimensions (mm) : 310 (L) x440(B) x 145(H) Standard Accessories : Power cable, Probe - 2Nos., Instruction manual	
30	Signal Generator 0-100Khz **Technical Specifications :** Frequency range : 1Hz ~ 100kHz Output waveform : Sine, Square, & Triangle Output impedance : 60ohms Approx. Amplitude Selector : 0.2V, 2V, 20V PP Selection dial : Analog dial (By coarse & fine selector) Output terminals : 4mm Power requirement : 220 VAC +10% , 50 Hz Weight : 2.0 Kg Approx. Dimensions (mm) : 275 (L) x 230 (B) x 110(H) **Standard Accessories :** Power cable, Instruction manual	02 Nos.

33	**Function generator (** 2Hz ~ 2MHz Digital) **Features :** A low cost signal source for laboratory use Output Waveform: Sine, Square, Triangle, Ramp, Pulse Voltage Control Frequency (VCF) input TTL output 50Hz Sine and single output Analog dial 0.5Hz~30MHz(Ext.) Frequency Counter **Technical Specifications :** Frequency range : 2Hz ~ 2MHz Digital Output waveform : Sine, Triangle, Square, Pulse, Ramp Output impedance : 50ohms + 10% Amplitude : >20Vp-p (1Mohm Load) : >10Vp-p (50ohm Load) DC offset : 0~+10V (1Mohm Load) : 0~+5V (50ohm Load) Symmetry range : 10% ~ 90% Output attenuation : 20dB, 40dB, 60dB Sine wave distortion : 20Hz ~ 20kHz<1 % Frequency response : 2Hz ~ 2MHz < +1dB Square wave rise or fall time : <30ns TTL output : <50ns Low level : <0.4V High level : >3.5V Impedance : 100ohm	02

	VCF Input Input voltage : -5V~0V Input impedance : 10kohm +10% 50Hz Output : 2Vp-p, main synchrony **Frequency Counter** Display : 6 Digit Measuring range : 0.5Hz ~ 30MHz Input impedance : 10kohm +10% Sensitivity : 200mV rms Accuracy : 0.1Hz / 1Hz Error : <0.1%+1digit Max. Input voltage : 50Vp-p Power requirement : 220 VAC +10% , 50 Hz Weight : 3.0Kg Approx. Dimensions (mm) : 250(L) x 275(B) x 100(H) **Standard Accessories :** Power cable, BNC to Crocodile Clip Probes - 1No & BNC to BNC Probe - 1No., Instruction manual **Or** **Electronic Work Bench** **Features :** All devices (Instruments, Power Supplies, etc) are integrated in the device panel with modular construction Workbench have painted frame and device panel made of laminated board Work bench is equipped with 2nos power socket ,MCB provided for overload protection 2 No. of pull out drawer with lock & one No. of writing pad desk All fitting supplied with uniform color scheme Lockable wheels are provided on all four legs **Technical Specifications :** Oscilloscope : 20MHz Analog Oscilloscope (CRO)Dual Trace - 1no With component tester Function Generator: Function Generator - 1no DC Power Supply (Dual Output) : DC regulated power supply 30-0-30V 2 Amp - 1no : DC regulated power supply 0-24 V 1AMP Battery Charger : 2-12 VDC / 2AMP Power Switches : 2 nos (220VAC) Overload Protection : MCB provided Pull out drawer with Lock : 2 nos Writing Pad Desk : 1no Power requirement : 220 VAC +10% , 50 Hz Standard Accessories : Power cable, Probes, Instruction manual	
34	**Dimmer Stat,8Amp (Single Phase)** Technical Specifications: Variable Auto Transformer 0-270VAC Input Single Phase 230V Output Voltage 0-270VAC Output Current 8Amps	02 Nos.
35	**Analog Component Trainer** Technical Specifications : Inbuilt Variable / Fixed DC Regulated Power Supplies	04 Nos.

	Output voltages : 0-2.5VDC (2 Nos.) : +15VDC : -15VDC : +5VDC. On Board Digital Panel Meter Voltmeter : 0-2VDC / 0-20VDC (Duel Range) Glass Epoxt PCB used as front panel of 270 mm x 170mm & mounted on light weight shock proof plastic cabinet Symbol diagram printed on Glass Epoxt PCB & all important test Points are Brought out on front panel Power requirement : 230 VAC 10%, 50Hz. Weight : 2.3 Kg Approx. Dimensions (mm) : 300(L) x 175(B) x 75(H)	
36	**OP Amp Trainer** **Technical Specifications :** Inbuilt Fixed DC Regulated Power Supplies Output Voltages : 0-5VDC (2Nos.) : +12VDC IC's, Transistor & Components Provided IC : 741 Transistor : CL 100 (NPN) Resistances Capacitors High quality Aluminum used as front panel of 270 mm x 170mm & mounted on light weight shock proof plastic cabinet Circuit diagram printed on Aluminum Front Panel & all important test Points are brought out on front panel Power requirement : 230 VAC 10%, 50Hz. Weight : 1.0Kg Approx. Dimensions (mm) : 300(L) x 175(B) x 75(H) Standard Accessories : Power chord, Patch chords & Instruction manual.	03 Nos
37	**Digital IC Trainer** Technical Specifications : Inbuilt Fixed DC Regulated Power Supplies Output voltages : + 5VDC On Board Inputs, Switch, Indicators & Clock Logic Inputs : 8 Nos. logic '0' & logic '1' (Through SPDT Switches) Output indicators : 8 Nos. Clock : 1Hz, 100Hz, 1KHz Gates & Flip Flops NAND Gates : 4Nos. NOR Gates : 4 Nos. OR Gates: 4 Nos. AND Gates : 4 Nos. EX-OR Gates : 4 Nos. NOT Gates: 6 Nos. JK Flip Flop : 2 Nos. RS Flip Flop : 1 No. D Flip Flop : 1 No. Glass Epoxt PCB used as front panel of 400 mm x 225 mm & mounted on light weight shock proof plastic cabinet Symbol diagram printed on Glass Epoxt PCB & all important test Points are Brought out on front panel Power requirement : 230 VAC 10%, 50Hz.	04 Nos.
38	**Digital IC tester** **Features :** Tests most of the 6 to 40 pin ICs in DIP package as per give in Test Library Automatic testing of variety of Ics Potential free 40 pin universal ZIF socket Six Seven Segment/16x2 LCD Display It has 16/12 keys for its operation Audio alarm to user whenever it is required Power requirement : 220 VAC +10% , 50 Hz Weight : 1.0Kg Approx.	01 No

39	Digital and Analog Bread Board Trainer Technical Specifications : DC Regulated Power Supplies Output voltages : One fixed DC regulated power supply of +5V/1Amp : One fixed DC regulated power supply of +15V/1Amp : One variable DC regulated power supply of 0-+15V /200mA Load regulation : + 0.2% Line regulation : + 0.05% Ripple : Less than 3mV RMS Protections : Short circuit & over load protected AC Supply Output voltage : 5V-0V-5V,10V-0V-10V. Can be used as 5V,10V,15V, 20V &also as center tap Function Generator/TTL Generator Operating modes : Sine, Square Frequency range : 10Hz to 1MHz (Amplitude 15V pp Sine Wave) (Amplitude 10Vpp Square Wave) TTL : 5V TTL Clock Fixed : 0.1Hz Switches/LED/Display 8 Nos toggle switches for High/Low TTL Level 8 Nos. LED Display (High Low TTL Level) Logic Probe Logic level indicator for TTL(7 Seg.) Potentiometer & Speaker 6 Nos. Potentiometer (100ohm ~ 47Kohm) &Speaker 8 ohms for audio use Power requirement: 220 VAC +10% , 50 Hz Weight: 4.0Kg Approx.	06 Nos.
40	Rheostats Various values and ratings Rheostat 10ohms/10Amps Rheostat 300ohms/2Amps Rheostat 100ohms/5Amps Rheostate 50 Ohms/ 5 Amps. (Double Tube) Rheostate 250 Ohms/ 3 Amps.	02 Nos.
41	Power Electronics Trainer with at leat 6nos of onboard applications. **Objective** a) DC Fan speed control using PWM & Mosfet. b) AC Fan speed control using TRIAC & DIAC Triggering. c) Light intensity control using SCR & R triggering. d) Light intensity control using PWM & IGBT. e) Temperature control using Comparator & BJT. f) Light activated Solid State Switch. **Technical Specification** 1. 12V DC fan is provided separately for DC fan speed control experiment on the front panel with connecting 2mm sockets(Red & Black). 2. Separate Oven is provided with thermometer for temperature control experiment. 3. Separate 4mm shrouded sockets(Black) are provided marked as “TO LOAD(AC FAN & LAMP)” to connectAC fan or lamp. 4. 220V AC is available on 4mm shrouded sockets(Black) marked as “AC SUPPLY 220V AC” on front panel. 5. Circuits for different experiments are printed separately in blocks on front panel. **STANDARD ACCESSORIES** 1. Singlepoint (2mm) patchcords for interconnections - 02 Nos. 2. Singlepoint (4mm) patchcords for interconnections - 04 Nos. 3. Powerchord - 01 No. 4. Instruction Manual - 01 No. 5. Lamp holder with Lamp with 2-pin lead - 01 No. 6. AC fan fitted on wooden stand with 2-pin lead - 01 No. 7. Thermometer(1000C) - 01 No	04 No

42	Computers in the assembled form (including cabinet, motherboards, HDD, DVD, SMPS, Monitor, KB, Mouse, LAN card, Blu-Ray drive and player), MS Office education version.	04 Nos.
43	Laptops latest configuration	01 No
44	Laser jet Printer	01 No
45	INTERNET BROADBAND CONNECTION	01 No
46	Electronic circuit simulation software with 6 user licenses	01 No
47	Different types of electronic and electrical cables, connectors, sockets, terminations	As required
48	Different types of Analog electronic components, digital ICs, power electronic components, general purpose PCBs, bread board, MCB, ELCB	As required
49	Crimping tools as necessary for performing terminations mentioned week no 17-21 of SEM-1	As required
	WORKSHOP FURNITURE:	
	Instructor's table	01 No
	Instructor's chair	02 Nos.
	Metal Rack, 100cm x 150cm x 45cm	04 Nos.
	Lockers with 16 drawers standard size	02 Nos.
	Steel Almirah, 2.5 m x 1.20 m x 0.5 m	02 Nos.
	Black board/white board	01 No
	A. Tools & Equipments for the trade of Electronics Mechanic for Third Semester	
1	DSO (colour) **Features :** 5.7-inch color LCD display Band width & Sampling rate 25MHz DSO 2 x 512k words per Channel Record Length (Memory 2.5k~25k / CH) Auto-Setting for quick setup and waveform acquisition Advanced Cursor Modes: Manual, Auto and Track, Voltage, Time,Period FFT Function PC interface using Software USB-Host / Device **Technical Specifications:** **Display** Type : 5.7" Rectangle Color LCD Back light intensity : 60cd/m2 Display resolution : 320 Horizontal 240 Vertical Pixels Display contrast : Adjustable **Vertical System** Sensitivity and accuracy : 2mV / Div ~ 5V / Div	01 No

	Vertical resolution	: 8Bit	
	Band width (-3dB)	: DC (AC 10Hz) ~ 25MHz	
	Rise time	: <14ns	
	Single shot band width	: 25MHz	
	Input coupling	: DC, GND, AC	
	DC gain accuracy	: +4% (2mV/Div) +3% (5mV/Div ~ 5V/Div)	
	Delta voltage measurement accuracy	: + (3% Rdg + 0.05Div)	
	Horizontal System		
	Sec / Div range	: 5ns ~ 50s / Div	
	Sampling range	: 250MSa/s	
	Waveform interpolation	: (Sinx) / x	
	Record length	: 1024k	
	Sampling rate and delay time accuracy	: +100ppm over any >1ms Time Interval	
	Delta time measurement accuracy	: + (1 Sampling Interval Time + 100ppm x rdg + 0.6ns)	
	Trigger System		
	Trigger source	: CH 1, CH 2, EXT, EXT/5	
	Mode	: Auto, Normal, Single	
	Type	: Edge, TV, Pulse, Width	
	Hold off range	: 100ns ~ 1.5s	
	Math	: Add, Subtract, Multiply, Divide, and FFT	
	FFT window	: Hanning, Hamming, Blackman, Rectangular	
	Acquire Input		
	Acquisition mode	: Sampling, Peak Value Sampling and Smoothness sampling	
	Input coupling	: DC, GND, AC	
	Input impedance	: 1Mohm +2% 24pF +3pF	
	Probe attenuation	: 1X, 10X, 100X, 1000X	
	Max. Input voltage	: 400V (DC = AC peak)	
	Channel CMR	: Better then 40 : 1	
	Channel isolation	: Better then 40 : 1	
	Display persist time	: 1s, 2s, 5s	
	Storage	: Waveform, Setup, Bit	
	Recorder	: Record, Replay	
	Measurements		
	Cursor	: Voltage Difference (Delta V) Between Cursors Time Difference (Delta T) Between Cursors Reciprocal of Delta T in Hz (1 / Delta T)	
	Auto measure	: Vrms, Vavg, Vp-p, Vmax, Vtop, Vhigh, Vlow, Vmid, :Vamp, Period, Frequency,Rise, Fall, +Width, - Width, : +Duty, -Duty,Delay	
	I/O		
	Standard	: USB (D); USB (Host)	
	Calibrator Signal		
	Output voltage	: 3V p - p (>1Mohm Load)	
	Output frequency	: 1kHz	
	Power requirement	: 220 VAC +10% , 50 Hz	
	Weight	: 2.5Kg Approx.	
	Dimensions (mm)	: 320 (L) x130(B) x 150(H)	
	Standard Accessories :		

	Power cable, Probe - 2Nos., Instruction manual, Software CD with USB cable	
2	**Soldering & Desoldering Station** (with Automatic Vaccum Suction Desoldering Pump) **Features :** High-performance thermostat function Suitable for soldering&desoldering different components The soldering iron and desoldering iron can be used independently or at the same time LCD Display with Backlight **Technical Specifications :** Main Unit Power consumption : 60W + 80W Main fuse : 3Amp Function display : LCD Soldering Section: Voltage : 24V AC Power : 60W heat up rating 130W Temperature : 160OC - 480OC Heating element : Ceramic Heater Desoldering Section: Voltage : 24V AC Vaccum pressure : 600mm Hg Power : 80W Temperature : 160OC - 480OC Power requirement : 220 VAC +10% , 50 Hz Weight : 6.0Kg Approx. Dimensions (mm) : 220(L) x 225(B) x 160(H) **Standard Accessories :** Power cable, Soldering iron, Desoldring gun, Instruction manual	01 No
3	SMD Soldering & De soldering Station with necessary accessories Technical Specifications : Power consumption 250W High quality heating element Diaphragm air pump Air flow 23e/min (maximum) Supply with Air Nozzle Power requirement : 220 VAC +10% , 50 Hz Weight : 3.0Kg Approx. Dimensions (mm) : 190(L) x 250(B) x 130(H) Standard Accessories : Power cable, Desoldering gun, Instruction manual	02 Nos.
4	DOL starter	01 No
5	AC motor ¼ HP	01 No
6	**ELECTRICAL TRAINER FITTED WITH RESOURCES MENTIONED AT Sl No (DOL starter, contactors, relays, MCB, Motor suitable for electrical control circuit exercises)**	02 Nos.
7	Frequency modulator and Demodulator trainer kit Technical Specifications : In built IC based DC regulated power supply +12V/ 250mA On board sine wave audio frequency signal generator Frequency: 2 KHz & 4KHz Amplitude: 0-2.8Vpp Approx. Modulation using VCO 8038 (Carrier generator internally 62KHz, 5.5Vpp) Demodulation circuit using phase locked loop IC LM 565 Glass Epoxy PCB used as front panel of 270mm x 170mm & mounted on light	02 Nos

	Weight shock proof plastic cabinet Circuit diagram printed on Glass Epoxy PCB & all important IC's& test points are brought out on front panel Power requirement : 220 VAC +10%, 50Hz Weight : 1.0Kg Approx. Dimensions (mm) : 300(L) x 175(B) x 75(H) Standard Accessories : Power Chord, Patch Chords & Instruction Manual	
8	PAM, PPM,PWM trainer kit Technical Specifications : In built IC based DC regulated power supply +12V, + 5V/ 300mA On board sine wave audio frequency signal generator Frequency : 1 KHz & 2KHz Amplitude : 0-10Vpp & 0-4Vpp Approx. On board square wave signal generator Frequency :1 KHz & 2KHz Amplitude : 5Vpp Approx. On board sampling pulse generator Frequency : 8KHz,16KHz, 32KHz, 64KHz Amplitude : 5Vpp Approx. Demodulation of PAM/PPM/PWM using 4th order / low pass filter & AC amplifier using TL 074 with adjustable gain control Voice Communication: Voice Link using dynamic Mic& Speaker DC Output : 0-4V (Variable) 8 Nos. Fault Switches & 29 Test Points Glass Epoxy PCB used as front panel of 400mm x 225mm & mounted on shock proof cabinet Circuit diagram printed on Glass Epoxy PCB & all important IC's& test points are brought out on front panel Power requirement : 220 VAC +10%, 50Hz Weight : 4.5Kg Approx. Standard Accessories : Power Chords, Patch Chords, Sensitive MIC, Ear Phone & Instruction Manual	02 Nos
9	AM/FM Commercial radio receivers Trainer Technical Specifications : In built IC based DC regulated power supply+6V/250mA Receiver Principal :Superheterodyne, Frequency Range :525KHz to 1625KHz Intermediate Frequency: 455KHz One speaker of coil impedance : 4W 12 Test points provided on front panel only for observations 15 Fault switch provided on front panel for fault creation Glass Epoxy PCB used as front panel of 300mm x220mm & mounted on light weight shock proof plastic cabinet Circuit diagram printed on Glass Epoxy PCB & all important components & test points brought out on front panel. Power requirement: 220 VAC +10% , 50 Hz Weight : 2.0Kg Approx. Dimensions (mm) : 330 (L) x225(B) x 75(H) Standard Accessories : Power Chord, Patch Chords, & Instruction manual	02 Nos
10	Microcontroller kits (8051) along with programming software (Assembly level Programming) 8031 Microcontroller Trainer **Feature:**	04 Nos.

	8051/89C52 CPU operating @ 11.0592 Mhz. 32K user RAM using 62256 with Battery Backup using NICD Battery 16K bytes of powerful monitor EPROM using 27512. One memory socket is provided for expansion up to 64k 48 I/O lines using 2 Nos. of 8255 brought at 26 Pins FRC Connector to interface with IC-XX Series. Three Channel Timer/Counter using 8253 brought out at 10 Pins FRC Connector. 20x2 Alphanumeric LCD Display with Backlite. **Technical Specification:** 101 ASCII Keyboard interface using 89C2051 operating @ 12MHz. Two External interrupts INT0 & INT1 are available at 40 pin FRC connector. RS-232C using RX/TX of 8051 terminated on 9 Pins D-Type Connector.. RS-232C using RX/TX of 8051 terminated on 9 Pins D-Type Connector.. Two modes of operation: - ASCII Keyboard Mode. - Serial Mode. Powerful Commands like Examine/Edit Memory, Examine/Edit Register, Single stepping, Execution, Break Point can be used through ASCII keyboard or PC serial mode. Facility for Downloading/Uploading files from/to PC. All Address, Data, Control & Port lines are available on 40 Pins & 10 Pins FRC Connector. All ICS are mounted on IC Sockets. Bare board Tested Glass Epoxy SMOBC PCB is used. In-Built Power Supply of +5V/1.5A, ±12V/250mA User's Manual with sample programs	
11	Application kits for Microcontrollers 6 different applications 8031 Microcontroller Trainer Cards ADC-0809 Interface Dual DAC Interface Logic Controller Interface Elevator Simulator I-Face IC Tester Interface Display Interface Stepper Motor Interface Stepper Motor 0.25 kg-cm Torque	01 Set
12	Sensor trainer kit (containing Various sensors like Thermocouple, RTD, Thermocouple, load cell, strain gauge, LVDT, smoke sensors, speed sensor) **The kit comprises of following experiments:** 1. Thermocouple transducer, 2. RTD transducer, 3. LVDT transducer, 4. Strain Gauge transducer, 5. Load Cell transducer, 6. Smoke Sensor Alarm, 7. Speed Sensor. **SPECIFICATIONS:** **A) THERMOCOUPLE** **Transducer:** Type 'K' (Chromel - Alumel) Thermocouple. **Signal Conditioner Circuit:** First Stage Amplifier : DC Differential (Gain -10). Second Stage Amplifier : Summing amplifier with zero and Gain (1-25) adjustment. Power Source : ±5V DC **Room Temperature Compensation Network** **Digital Panel Meter** **Milli volt Source** : -10 to + 25, mVolt(Approximate)	02 Nos.

B) RTD TRANSDUCER

1. Transducer:
Resistance Temperature Detector (PT - 100).

2. Signal Conditioner Module:
Excitation Source : Constant Current Type.
First Stage Amplifier : D.C. Differential.
Second Stager Amplifier : Summing amplifier with ZERO and GAIN adjustment.
Power Source : + 5,Volt D.C.

3. Digital Panel Meter

C) LVDT
Regulated Power Supply of ±5V DC/ 300mA.Separate mechanism for LVDT (LVDT Jig) with provision to connect
it through 5pin female connector to the signal conditioning circuit.3½ Digit Digital Panel Meter (DPM) voltmeter on
front panel for direct measurement of displacement in mm scale.Internally generated carrier frequency of
5KHz(Approx.), 2V peak to peak.Range-10-0-10mm

D) SPEED SENSOR
1. DC Variable Power Supply to change the speed of the motor and a 5V Fixed for Proximity sensor(NPN
NO Type).
2. Proximity sensor(NPN NO Type) fitted near to the slotted disc attached to the motor.
3. 4 Digit Digital Panel Meter for SPEED & RPM measurement.
4. Electronic circuit with 1Hz Clock Pulse,wave shapper (converter), a multiplier and a counter.

E) STRAIN GUAGE
(i) Cantilever Beam : With a bonded strain Gauge
(ii) Electronic Circuit :
Excitation Source : DC Excitation (5 Volt)
Amplifiers : Instrumentation and Inverting Summing Amplifier with Zero & Gain adjustment
Termination : For 2 arm strain gauge bridge.
Dummy Gauges : 3 Nos. provided
(iii) DPM : 3½ Digit LED
(iv) Power Supply : The kit has number of IC Regulated Power Supplies which are permanently
connected to all the circuits.

F) LOAD CELL
1. Load Cell made of four banded metal strain gauges with arrangement to fix some load on it to generate
the deformation.
Load Cell : Strain Gauge based
Measuring Range : 0-10Kg.
Non-linearity error : ±1%
Resolution : 0.01Kg.
2. Electronic Circuitry alongwith a 3½ Digit Digital Voltmeter

Electronic Circuit
Excitation source : DC excitation (5Volts)
Amplifiers : Instrumentation Amplifier and Inverting Summing Amplifier
With Gain and Zero adjustment.
Termination : For 4 arm Strain Gauge Bridge

Digital Voltmeter
Display : 3½ Digit LED display
3. The kit has numbers of IC Regulated Power Supplies which are permanently connected to all the
circuits.No external D.C.supply should be connected to the training kit.Only 230Volt, ±10%,50Hz main

	supply is required to operate the training kit. 4. Suitable Mechanism to apply the Load on a pan. **G) SMOKE SENSOR** MQ6 for sensing the smoke with associated circuitry(IC NE555,Relay,Transistor,Diodes,Buzzer,resistances,capacitors etc.)	
13	Various analog and digital ICs useful for doing project works mentioned in the digital and analog IC applications modules	As required
14	Different types of electronic and electrical cables, connectors, sockets, terminations	As required
	A. Tools & Equipments for the trade of Electronics Mechanic for Fourth Semester	
1	Fiber Optic Trainer Technical Specifications : In built IC based Fixed DC regulated power supply +6VDC & 3VDC Pre amplifier stages consists of MIC (Microphone), Photodetector, Transistors (548) and biasing network of Resistance and Capacitors Power amplifier stages consists of impedance matching transformers (Driver Transformers), Transistors (8550) & biasing network of Resistance and Capacitors Output section having LEDs and speaker, Fiber optic cable for transmission ofSignal Circuit diagram printed on Glass Epoxy PCB & different combination of Resistance & test points are brought out on front panel Glass Epoxy PCB used as front panel of 300mm x 220mm & mounted on light weight shock proof plastic cabinet Power requirement: 220 VAC +10% , 50 Hz Weight: 3.0Kg Approx. Dimensions (mm): 330 (L) x225(B) x 75(H) Standard Accessories : Optical Fiber Cable Connectors), Mic& Speaker, Wooden assembly to hold Fiber Cable, Graph Paper, Power Chord, Patch Chords & Instruction Manual	02 Nos.
2	Seven segment DPM	06 Nos.
3	LCD based DPM	06 Nos.
4	SMPS of different make	04 Nos.
5	UPS trainer 500VA Technical Specifications : On board controller PCB On board input/output transformer & chargeable battery Digital panel meter for current reading 5 Test points provided on front panel only for observations 5 Fault switch provided on front panel for fault creation LED Indicators for status mode Power Requirement: 220VAC+10%,50Hz Standard Accessories : Power Chord & Instruction Manual	01 No
6	UPS 3 KVA with backup time minimum 30 minutes	01 No
7	Mobile phone (different models) at least one 3 G mobile	03 Nos.
8	Smart phones of different make (android/Windows)	04 Nos.

9	Precision set of screw drivers- T5, T6, T7	02 Nos.
10	Tweezers – Bend tip	02 Nos.
11	Cell phone power source with charger chords for different cell phones	01 No
12	LCD TV (Trainer kit)	01 No
13	LCD TV (21”)	02 No
14	LED TV (Trainer kit) LED TV Trainer is a useful trainer for providing theoretical and practical knowledge of a general LED Digital TV (DTV). **SPECIFICATIONS:** 1. Display Resolution : 1366X768 2. Aspect Ratio : 16 : 9 3. TV System : PAL/BG 4. Video Signal System : PAL/NTSC/SECAM 5. Receiving Channel : 1-200 6. Input Power Voltage : AC 100-240V 50/60Hz 7. Power consumption : 40W 8. Audio Output Power(THD<7%) : 2x3W 9. Signal Input/Output : Analog RGB(VGA)x1 High-Definition Multimedia Interface(HDMI)x2 Composite Video Input x1 Composite Video Output x1 Audio Input x2 YCb (Pb) Cr (Pr) x1 HEADPHONE X1 USB X1 RF X 1 10. Horizontal definition (TV line) : Composite Video input >=350 YCb(Pb) Cr(Pr) >=400 11. Environmental Considerations Operating Temperature : 10°C to 40°C Operating Humidity : 10% to 80%, non-condensing Storage Temperature : -20°C to 45°C Storage Humidity : 5% to 95%, non-condensing 12. Screen Size : 61 cm	01 No
15	LED TV (21”)	02 No
16	Home theatre system	01 No
17	Solar Power Inverter 500VA	01 No
18	LED lighting system	02 sets