

**INVITATION TO TENDER  
AND  
INSTRUCTIONS TO TENDERERS**



**JNTU COLLEGE OF ENGINEERING PULIVENDULA  
KADAPA DISTRICT, PIN – 516 390**

**JNTU College Of Engineering, Pulivendula**  
**INVITATION TO TENDER AND INSTRUCTIONS TO TENDERERS**  
**FOR THE SUPPLY OF LAB EQUIPMENT/ SOFTWARE AND LIBRARY BOOKS**

JNTU College of Engineering, Pulivendula invites tenders for the supply of (A) Lab Equipment/ Software (B) Library books for JNTU College of Engineering, Pulivendula, Kadapa District, as per specifications/ list given in the schedules attached to the Tender form annexed hereto. All offers should be made in English and should be written in both figures and words.

The tender schedules can be obtained from the Principal, JNTU College of Engineering, Pulivendula on payment of Rs.2,000/- (Rupees two Thousand only) in the form of crossed Demand Draft on any Nationalized Bank drawn in favour of the “Principal, JNTU College of Engineering, Pulivendula” payable at Pulivendula. Alternatively the tender schedules can be downloaded from the website [www.jntuanantapur.org](http://www.jntuanantapur.org). Such vendors who use downloaded tender schedules for submitting bids must enclose a demand draft for Rs.2,000/- (inclusive of service tax) towards the tender fee along with the bid in addition to EMD otherwise the bid will be rejected.

Tender fee once paid is neither refundable nor adjustable for other tenders.

The JNTU College of Engineering, Pulivendula reserves the right to select certain items (in single or multiple units) and reject the others mentioned in the schedule. The institution reserves the right to place the orders for individual items with different vendors. The JNTU College of Engineering, Pulivendula also reserves the right to revise or alter the specifications of the Lab Equipment before acceptance of any tender.

Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored, and rejected.

The instructions for the tenderers for the supply of (A) lab equipment/software (B) Library books are given below separately

## INSTRUCTIONS TO TENDERERS FOR THE SUPPLY OF

### (A) LAB EQUIPMENT/ SOFTWARE

#### **EMD:**

A Demand Draft, for an amount @2% of the estimated value of the schedule(s) for which the tenderer is submitting the bid, drawn in favour of the “Principal, JNTU College of Engineering, Pulivendula” towards EMD must accompany the tender. Those without EMD or EMD less than the prescribed value will be rejected. The EMD will be refunded to all the unsuccessful tenderers only after the purchase orders are placed on the successful tenderer. The successful tenderer has to deposit an additional amount at 3% of the contract value as security money deposit.

The final acceptance of the material will be made only after delivering in good condition and subject to satisfying specifications given by the College.

**Vendor**

#### **BID PRICE:**

1. The contract shall be for the full quantity as described in the tender. Corrections, if any, shall be made by crossing out, initialing, dating and re-writing.
2. All duties, taxes and other levies payable by the vendor shall be clearly mentioned in the price bid.
3. The rates quoted by the bidder shall be fixed for the duration of the contract and shall be included in the total price.
4. The Prices should be quoted in Indian Rupees only.
5. The prices quoted should be FOR destination.
6. Packing, forwarding, insurance etc to vendors account.
7. After satisfactory installation, testing and demonstration, training has to be provided to faculty and staff to the satisfaction of the purchaser at vendor's cost.
8. All essential accessories cost must be included in the price quoted.
9. The cost of essential spares are to be quoted separately. This will be taken into consideration while bids are evaluated.
10. Price bids are to be essentially signed by the vendor or person authorized by him.
11. Each bidder shall submit only one quotation. Alternatives offer option, if any, must be quoted in separate tender schedule.

#### **VALIDITY OF QUOTATION**

Quotation shall remain valid for a period of three months after the deadline date specified for submission. The vendor shall extend the validity if required.

#### **BIDDER QUALIFICATIONS:**

1. Bidder must be a registered company with Sales Tax and Excise Departments and a true copy of the such registration should be submitted along with the bid.
2. The bidder should submit the financial turnover report for the last three years.
3. The bidders should submit the list of customers along with year of supply and details of equipment supplied.
4. The bidders should submit Satisfactory Performance Certificates from the customers of this equipment. The product approval certificate, if any, from reputed organizations may also be submitted.

## **Vendor**

### **EVALUATION OF QUOTATIONS:**

The purchaser will evaluate and compare the quotations determined to be substantially responsive i.e which

- a) Are properly signed; and
- b) Conform to the terms and conditions, and specifications mentioned in this
- c) The quotations unless otherwise specified would be evaluated separately for each item.
- d) If the bidder is not the Original Equipment Manufacturer (OEM) they must Provide an authorization certificate from the Original Equipment Manufacturer, stating that the bidder is an approved agent of OEM and service warranty will be guaranteed by OEM in case the agent's license is aborted or any other reason whatsoever during the warranty period.

### **AWARD OF CONTRACT:**

The purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

1. Notwithstanding the above, the purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.
2. The institution reserves the right to place the orders for individual items with different tenders.

### **3. Right to Acceptance:**

The Principal, JNTU College of Engineering, Pulivendula does not bind himself to accept the lowest on any tender and reserves to himself the right of accepting the whole or any part of the tender or portion of the quantity offered the tenderer shall supply the same at the rate quoted.

4. The bidder, whose bid is accepted, will be notified for the award of contract by the Purchaser prior to expiry of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

**DELIVERY:**

All the goods ordered shall be delivered with proper packing within 30 days from the date of issue of order

**Vendor**

**TERMS OF PAYMENT:**

5. Payment shall be made by JNTU College of Engineering, Pulivendula, after delivery at the specified location, and after installation, commissioning and satisfactory demonstration of the goods with all specifications and standards to the entire satisfaction of the college.
  - a) The bidder may give the details of bank and Account into which the payments are to be made.
  - b) Normal commercial warranty/guarantee shall be applicable to the supplied goods.

**DELIVERY OF TENDER:**

Bids for each schedule of the tender is to be placed in separate envelope, clearly mentioning schedule No. on it, and all these envelopes containing quotations for individual schedules are to be placed in a bigger envelope. The Bigger Envelope must be super-scribed with the reference No.(JNTUCEP/TENDER/1-2011/Schedule No\_\_\_\_\_/2011-12, dt:\_\_\_\_\_)

The sealed tender should be addressed to:

**The Principal,  
JNTU College of Engineering,  
Pulivendula,  
Kadapa District,  
Pin code: 516390.**

**Bids in sealed covers should reach the above address latest by 15.00 hours on or before 23-05-2011. Tenders submitted after the specified time shall not be considered and no intimation will be sent in this regard.**

The college reserves the Right to reject any tender which fails to comply with the above instructions. All tenders should be sent by Post or through messenger, to drop the tender in

the sealed tender box provided in the office. It is the responsibility of the tenderer to see that his tender offer is delivered by the specified time at the above address. All further communication should be addressed to the officer named above and by title only.

**Other Terms :**

Tenderer should make their representative available on 23-05-2011 at 15.30 hours at the time of opening tenders in the chambers of Principal or any other designated place within the college.

The tenderer should produce Value Added Tax (VAT)-Registration certificate.

**Tenderer should be responsible and bear any price escalation within the validity period and also after the indent has been placed till the supply.**

Sd/- PRINCIPAL

**BID PARTICULARS**

1. Name of the Supplier :
2. Address of the Supplier :
  
3. Address of the Show Room/Workshop :
4. Display of goods : Yes/No
5. EMD enclosed : Yes/No  
DD No. \_\_\_\_\_ Bank \_\_\_\_\_ Amount \_\_\_\_\_
  
6. Name and address of the officer to whom all reference shall be made regarding this tender enquiry.  
  
Name :  
  
Address :

Telephone No. :

Fax No. :

Mobile No. :

e-mail :

web :

**Vendor**

**FORMAT OF QUOTATION**

S.No	Schedule No...(As given in the Annexure)	Description Goods	Specifications	Qty	Unit	Quoted Unit Rate in Rs.	Total Amount	
							In Figures	In words

**Gross Total Cost : Rs.....**

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. .... (Amount in figures) ..... (Rs. Amount in words), inclusive of all taxes, within the period specified in the Invitation for Quotations.

We also confirm that the normal commercial warrantee/guarantee of ..... Months shall apply to the offered goods.

**Signature for Supplier**

## **INSTRUCTIONS TO TENDERERS FOR THE SUPPLY OF (B) LIBRARY BOOKS**

**JNTUA College of Engineering, Pulivendula** invites tenders for the supply of Text Books for JNTUA College of Engineering, Pulivendula, Y.S.R. District, as per the list given in the schedules attached to the Tender form annexed hereto. All offers should be made in English and should be written in both figures and words.

The tender schedules can be obtained from the Principal, JNTUA College of Engineering, Pulivendula on payment of Rs.2,000/- (Rupees One Thousand only) in the form of crossed Demand Draft on any Nationalized Bank drawn in favor of the “Principal, JNTUA College of Engineering, Pulivendula” payable at Pulivendula. Alternatively the tender schedules can be downloaded from the website [www.jntuanantapur.org](http://www.jntuanantapur.org). Such vendors who use downloaded tender schedules for submitting bids must enclose a demand draft for Rs.2,000/- towards the tender fee along with the bid in addition to EMD otherwise the bid will be rejected.

Tender fee once paid is neither refundable nor adjustable for other tenders.

The JNTUA College of Engineering, Pulivendula reserves the right to select certain books and reject the others mentioned in the schedule. The JNTUA College of Engineering, Pulivendula also reserves the right to revise or alter the books and quantity before acceptance of any tender.

Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.

### **EMD:**

A Demand Draft, for an amount of Rs. 30,000/- (Rupees Twenty thousand only) towards EMD, drawn in favor of the “Principal, JNTUA College of Engineering,

Pulivendula” must accompany the tender. Those without EMD or EMD less than the prescribed value will be rejected. The EMD will be refunded to all the unsuccessful tenderers only after the purchase orders are placed on the successful tenderer.

The final acceptance of the Books will be made only after delivering in good condition and subject to satisfying specifications given by the College.

## **Vendor**

### **BID PRICE:**

12. The contract shall be for the full quantity as described in the tender. Corrections, if any, shall be made by crossing out, initialing, dating and re-writing.
13. All duties, taxes and other levies payable by the vendor shall be clearly mentioned in the price bid.
14. The rates quoted by the bidder shall be fixed for the duration of the contract and shall be included in the total price.
15. The Prices should be quoted in Indian Rupees only.
16. The prices should be quoted with FOR destination.
17. Packing, forwarding, insurance etc to vendors account.
18. Price bids are to be essentially signed by the vendor or person authorized by him.
19. Each bidder shall submit only one quotation. Alternatives offer option, if any, must be quoted in separate tender schedule.

### **VALIDITY OF QUOTATION**

Quotation shall remain valid for a period of three months after the deadline date specified for submission. The vendor shall extend the validity if required.

### **BIDDER QUALIFICATIONS:**

5. Bidder must be a registered company with Sales Tax and Excise Departments and a true copy of the such registration should be submitted along with the bid.

6. The bidder should submit the financial turnover report for the last three years.
7. The bidders should submit the list of customers along with year of supply and details of books supplied.
8. The bidders should submit Satisfactory service Certificates from the customers of these books.

**EVALUATION OF QUOTATIONS:**

The purchaser will evaluate and compare the quotations determined to be substantially responsive i.e. which

- e) Are properly signed; and
- f) Conform to the terms and conditions, and specifications mentioned in this

**Vendor**

## **AWARD OF CONTRACT:**

The purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered **Maximum Discount**.

7. Notwithstanding the above, the purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.
8. **Right to Acceptance:**  
The Principal, JNTUA College of Engineering, Pulivendula does not bind himself to accept the lowest on any tender and reserves to himself the right of accepting the whole or any part of the tender or portion of the quantity offered. The tenderer shall supply the same at the rate quoted.
9. The bidder, whose bid is accepted, will be notified for the award of contract by the Purchaser prior to expiry of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

## **DELIVERY:**

All the Books ordered shall be delivered with proper packing within 30 days from the date of issue of order

## **TERMS OF PAYMENT:**

- c) Payment shall be made by JNTUA College of Engineering, Pulivendula, after delivery at the specified location, and in good condition with all specifications and standards to the entire satisfaction of the college.
- d) The bidder may give the details of bank and Account into which the payments are to be made.
- e) Normal commercial warranty/guarantee shall be applicable to the supplied goods.

## **DELIVERY OF TENDER:**

Bids for the tender should be placed in an envelope and properly sealed, and the envelope. must be super-scribed with the reference No.(JNTUACEP/TENDER/Library Books/01-2011/Schedule No.: LB-1/2011-12, dt:\_\_\_\_\_)

The sealed tender should be addressed to:

**The Principal,  
JNTUA College of Engineering,  
Pulivendula,  
Y.S.R. District,  
Pin code: 516390.**

**Vendor**

**Bids in sealed covers should reach the above address latest by 15.00 hours on 23.05.2011. Tenders submitted after the specified time shall not be considered and no intimation will be sent in this regard.**

The college reserves the Right to reject any tender which fails to comply with the above instructions. All tenders should be sent by Post or through messenger, to drop the tender in the sealed tender box provided in the office. It is the responsibility of the tenderer to see that his tender offer is delivered by the specified time at the above address. All further communication should be addressed to the officer named above and by title only.

**Other Terms :**

Tenderer should make their representative available on **23.05.2011 at 15.30 hours** at the time of opening tenders in the chambers of Principal or any other designated place within the college.

The tenderer should produce Value Added Tax (VAT)-Registration certificate.

**Tenderer should be responsible and bear any price escalation within the validity period and also after the indent has been placed till the supply.**

Sd/-  
PRINCIPAL

## **BID PARTICULARS**

1. Name of the Supplier :
2. Address of the Supplier :
  
3. Address of the Show Room/Workshop :
4. Display of goods : Yes/No
5. EMD enclosed : Yes/No  
DD No. \_\_\_\_\_ Bank \_\_\_\_\_ Amount \_\_\_\_\_

10. Name and address of the officer to whom all reference shall be made regarding this tender enquiry.

Name :

Address :

Telephone No. :

Fax No. :

Mobile No. :

e-mail :

web :

**Vendor**

## FORMAT OF QUOTATION

S.NO	TITLE	AUTHOR	PUBLISHER	No.of copies	rate	cost

**Gross Total Cost : Rs.....**

**Discount offered in Percentage**

We agree to supply the latest editions of the Books listed in the tender for a total contract price of Rs. .... (Amount in figures) ..... (Rs. Amount in words), inclusive of all taxes, within the period specified in the Invitation for Quotations.

We also confirm that the books will be delivered within 30 days from the date of issue of order

**Signature for Supplier**

## ABSTRACT OF EQUIPMENT

### A) Equipment/Software

Schedule No	Name of the Furniture	Estimated Amount
E.1	Microwave and Optical Communications Lab	4,05,000=00
E.2	Digital Signal Processing Lab –Hardware kits	4,10,000=00
E.3	Digital Signal Processing Lab –Matlab Software	4,50,000=00
E.4	Electronics Lab	16,75,000=00
E.5	Split Air conditioners	3,60,000=00
E.6	Thermal Engineering Lab	3,20,000=00
E.7	Solid Mechanics Lab	2,20,000=00
E.8	Metrology Lab	4,50,000=00
E.9	Machine Tools Lab	46,20,000=00
E.10	CAD/CAM Lab	4,50,000=00
E.11	UV-VIS Spectrophotometer	4,50,000=00

### B) Library Books

Schedule No	Name of the Furniture	Estimated No. of Titles	Estimated No. of copies	Estimated Amount
LB-1	Books for College Library (List of Books are given in Schedule LB-1)	986	5836	15,00,000=00

# A) Equipment/Software

## ABSTRACT OF SCHEDULE – E.1

### Electronics & Communication Engineering Department

#### Microwave and Optical Communication Lab

Schedule No	Name of the Equipment	Quantity
E.1	1. Microwave Setup Benches	04 Benches
	2. Optical Fiber Trainer Kits	02 Sets

**Estimated Cost Rs. 4,05,000=00**

**EMD Amount Rs. 8,100=00**

Following page gives detailed specifications.

# Specifications of SCHEDULE – E.1

## Microwave and Optical Communication Lab

1. (a) **Reflex Klystron based Microwave bench with standard specifications and with the following components.**

Name of components	Quantity
1. Klystron power supply	1
2. Klystron mount	1
3. Klystron tube	1
4. Isolator	1
5. Frequency meter Direct Reading	1
6. Variable attenuator	1
7. Slotted section	1
8. Tunable probe	1
9. Detector mount	1
10. Movable short	1
11. Matched termination	1
12. VSWR meter Solid State	1
13. Stand	4
14. BNC cable	1
15. Cooling fan	1

1. (b) **Gunn Diode based Microwave bench with standard specifications and with the following components.**

Name of components	Quantity
1. Gunn power supply	1
2. Gunn oscillator	1
3. Pin modulator	1
4. Isolator	1
5. Frequency Meter Direct Reading	1
6. Slotted section	1
7. Tunable probe	1
8. VSWR meter solid state	1
9. Stand	4
10. BNC cable	1
11. Cooling fan	1

2. **Optical Fiber Trainer Kits with standard specifications for conducting the following Experiments.**

1. Characterization of LED.
2. Characterization of Laser Diode.
3. Intensity modulation of Laser output through an optical fiber.
4. Fiber Optic Digital link.
5. Measurement of NA.
6. Measurement of losses for Analog Optical link.

**ABSTRACT OF  
SCHEDULE – E.2**

**Electronics & Communication Engineering Department**

**Digital Signal Processing Lab**

**HARDWARE KITS**

<b>Schedule No.</b>	<b>Name of the Equipment</b>	<b>Quantity</b>
<b>E.2</b>	1. DSP Starter Kit (DSK) TMS 320C6713	06
	2. Image/Video Daughter Card with LCD display	01
	3. High Speed ADC/DAC card	01
	4. Multi Channel Audio Daughter Card	01

**Estimated Cost Rs. 4,10,000=00**

**EMD Amount Rs. 8,200=00**

Following page gives detailed specifications.

# Specifications of SCHEDULE – E.2

## Digital Signal Processing Lab

### I. Hardware Kit Details:

#### **1. TMS320C6713 DSP Starter Kit (DSK) with CCS :**

1. Texas Instrument's TMS320C6713 floating point DSP operating at 225 Mhz.
2. Embedded USB JTAG controller with plug and play drivers, USB cable included
3. TLV320AIC codec with sampling rates from 8khz to 96 Khz
4. 16MB of on board SDRAM
5. 512K bytes of on board Flash ROM
6. 3 expansion connectors (Memory Interface, Peripheral Interface, and Host Port Interface)
7. On board IEEE 1149.1 JTAG connection for optional emulator debug
8. Four 3.5 mm. audio jacks (microphone, line-in, speaker, and line out)
9. 4 user definable LEDs
10. 4 position dip switch, user definable
11. +5 Volt operation only, power supply included
12. **TMS320C6713 DSK specific Code Composer Studio from Texas Instruments**
13. 30days Trial version MATLAB CD
14. User Manuals and programs(hard Copy & Soft copy)

#### **2. TFT LCD Video/Image Daughter Card :**

1. TFT LCD Video Daughter Card must complies to TI DSK standard daughter card interface
2. Input: NTSC 30 fps
3. Output:RGB565
4. Display: 3.5 inch TFT LCD Display
5. Resolution: 320x240 16 bits/pixel
6. Pixel Arrangement: Landscape

#### **3.High Speed A/D and D/A Daughter Card :**

1. High Speed A/D and D/A Daughter Card must complies to TI DSK standard daughter card interface
2. High Speed 6MSPS ADC x 1, 12 bit 4 single-ended Analog Input
3. 4 AD channels and 2 DA channels
4. 165 MSPS DACx2 12 bit, 2 single-ended Analog output

#### **4. Four Channel Audio Daughter Card :**

1. High Speed A/D and D/A Daughter Card must complies to TI DSK standard daughter card interface
2. 4-synchronized 16 bit ADC & DAC Channels
3. Sampling Rate 8Khz to 48Khz
4. Facility to connect 4 Microphones Separately using stereo mini Jacks

**ABSTRACT OF  
SCHEDULE – E.3**

**Electronics & Communication Engineering Department**

**Digital Signal Processing Lab**

**MATLAB SOFTWARE**

<b>Schedule No.</b>	<b>Name of the Equipment</b>	<b>Quantity</b>
<b>E.3</b>	MATLAB Software with Optional Tool Boxes (Licensed Version)	01
	SIMULINK Software	01

**Estimated Cost Rs. 4,50,000=00**

**EMD Amount Rs. 9,000=00**

Following page gives detailed specifications.

**Specifications of**  
**SCHEDULE – E.3**

**MATLAB SOFTWARE Details:**

		Quantity
1.	MATLAB (Latest Version with following Toolboxes)	30 users
2.	SIMULINK	10 users
3.	Signal Processing Toolbox	2 users
4.	Communication Toolbox	2 users
5.	Filter Design Toolbox	2 users
6.	Image Processing Toolbox	2 users
7.	Wavelet Toolbox	2 users
8.	Image Acquisition Toolbox	2 users
9.	RF Toolbox	2 users
10.	Neural Network Toolbox	2 users
11.	Fuzzy Logic Toolbox	2 users
12.	Link for Code Composer Studio	2 users
13.	Filter Design HDL Coder	2 users
14.	Signal Processing Block set	2 users
15.	Communication Block set	2 users
16.	RF Block set	2 users
17.	Video & Image Processing Block set	2 users
18.	Optimization Toolbox	2 users
19.	Genetic algorithms	2 users

**ABSTRACT OF  
SCHEDULE – E.4**

**Electronics & Communication Engineering Department**

Electronics Laboratory Equipment for Strengthening the existing Laboratories:

<b>Schedule No</b>	<b>Name of the Equipment</b>	<b>Quantity</b>
<b>E.4</b>	1. Regulated Power Supplies	30
	2. Signal/Function Generators	30
	3. Cathode Ray Oscilloscopes	30
	4. Digital Multi meters	50
	5. Digital Storage Oscilloscopes	01
	6. Spectrum Analyzer	01
	7. Antenna Trainer System	01
	8. Radio Demonstrator Kit	01
	9. TV Demonstrator Kit	01
	10. Logic Analyzer	01
	11. Power Meters	05
	12. Logic Gate Trainers	05
	13. Decade Resistance Boxes	30
	14. Decade Capacitance Boxes	30
	15. Analog Communications Lab. Trainer Kits	28
	16. Digital Communications Lab. Trainer Kits	22

**Estimated Cost Rs. 16,75,000=00**

**EMD Amount Rs. 33,500=00**

Following page gives detailed specifications.

# **Specifications of** **SCHEDULE – E.4**

## **1. Specifications for Regulated Power Supply:**

1. Range : 0-30V/ 2Amps(Dual Channel with Digital Display meters)

## **2. Specifications for Signal/Function Generator:**

1. Frequency range: 2Hz-2MHz
2. Output wave Forms: Sine wave, Square Wave, Triangular Wave
3. Amplitude: 16V p-p(No load)
4. Impedance: 50 Ohms  $\pm 10\%$
5. Attenuator: 0dB/20dB/40dB/60dB
6. DC offset: 0-  $\pm 8V$ (Adjustable)
7. Symmetry: 10% - 90%
8. Display: 6 Digit LED Display

## **3. Specifications for Cathode Ray Oscilloscope:**

1. Band Width: AC- 10Hz – 20MHz(-3dB)  
DC- 0 – 20MHz(-3dB)
2. Magnification:  $x5 \pm 10\%$
3. Rising Time: 18nSec
4. Over shoot:  $\leq 5\%$
5. Damp:  $\leq 5\%$
6. Channels: Dual Channel
7. Trace: Dual Trace

## **4. Specifications for Digital Multi Meters:**

1. DCV Range: 400mV/4V/40V/400V/1000V Accuracy:  $\pm(0.5\%+4)$
2. ACV Range: 400mV/4V/40V/400V/750V Accuracy:  $\pm(0.8\%+10)$
3. DCA Range: 40mA/400mA/10A Accuracy:  $\pm(1\%+10)$
4. ACA Range: 400 $\mu$ A/4mA/40mA/400mA/10A Accuracy:  $\pm(1.5\%+10)$
5. Resistance Range: 400 $\Omega$ /4K  $\Omega$ /40K  $\Omega$ /400K  $\Omega$ /4M  $\Omega$ /40M  $\Omega$  Accuracy:  $\pm(0.8\%+4)$
6. Capacitance Range: 4nF/40nF/400nF/4 $\mu$ F/40 $\mu$ F/200 $\mu$ F Accuracy:  $\pm(2.5\%+20)$
7. Frequency Range: 100Hz/1000Hz/10KHz/100KHz/1MHz/40MHz

## **5. Specifications for Digital Storage Oscilloscope**

1. Frequency Range: 0 – 60MHz
2. Channels: Dual Channels+ External
3. Display: 7.8 inch Panel( 640x480 resolution)
4. Acquisition Mode: sample, Peak Detect, averaging
5. Sample Rate(Real Time): 250MS/s
6. Input Coupling: DC,AC
7. Input Impedance:  $1M\Omega \pm 2\%$
8. Probe Attenuation Factors: 1x,10x,100x,1000x
9. Maximum Input Voltage: 300Vp-p
10. Sampling range: 10S/s – 250MS/s
11. Time Base Range: Step as 1-2-5
12. Time Base Accuracy: 100ppm

## **6. Specifications for Spectrum Analyzer**

1. Frequency range: 0.15- 1050MHz (1 GHz)
2. CF adjustment Range: 0-1050MHz
3. Resolution of Frequency Display: 10KHz
4. RBW: 400KHz and 20KHz
5. Video Filter Band Width: 4KHz
6. Average Noise Level: -90dBm(20KHz Band Width)
7. Amplitude Range: -100dBm - +10dBm
8. Sweep rate: 40Hz

## **7. Specifications for Decade Resistance Boxes:**

1. 4decades (10- 100K)
2. 5 decades(1-100K,10-1M)
3. 6decades(1- 1M)

## **8. Specifications for Decade Capacitance Boxes:**

1. 4decades (100pF- 10 $\mu$ F)
2. 5decades(100pF- 10 $\mu$ F)
3. 6decades(10pF- 10 $\mu$ F)

## **9. Specifications for Antenna Trainer System:**

### For Transmitter:

1. Frequency: 5M Hz-2GHz, PLL synthesized in 3 ranges
2. Resolution: 50, 100,250, 500 kHz, 1 and 10MHz
3. Accuracy: 0.01%
4. Display: 16x2 Backlit LCD
5. Controls: Menu, Enter, Escape, Up & Down buttons
6. Memory: 1000 individual frequency values should be stored
7. Modulation FM: Internal 1 KHz/ External Microphone
8. RF level: 100dB $\mu$ V
9. Level Accuracy:  $\pm$ 3dB
10. Attenuator: 40dB automatic
11. Power supply: 220V AC $\pm$ 10%

### For Receiver:

The specifications from S.No 1-6 of transmitter are same for receiver

- Measurements: RF level in dB $\mu$ V with 0.1dB
- Dynamic range: 110dB( 70dB logarithmic+40dB attenuator)
- Input impedance: 75 $\Omega$
- Speaker: Inbuilt audio output
- Power supply: 220V AC $\pm$ 10%

## **10. Specifications for Radio Demonstrator Kit:**

### AM Radio section:

1. Tuning range: 520KHz-1620KHz
2. IF Frequency: 455KHz
3. Tracking:  $\pm 3$ dB from 700KHz – 1400KHz  
10dB Signal to Noise at 200 microvolt typical

### FM Radio section:

1. Tuning range: 88MHz-108MHz
2. IF Frequency: 10.7MHz
3. Tracking:  $\pm 5$ dB from 90MHz – 106MHz  
10dB Signal to Noise at 200 microvolt typical

It should consist of the following nine sections

- Audio Amplifier circuit
- AM Detector circuit
- AM IF circuit
- AM Amplifier circuit
- AM Mixer and Oscillator circuit
- FM Detector circuit
- First FM IF Amplifier circuit
- Second FM IF Amplifier circuit
- FM Radio Frequency stages.

## **11. Specifications for TV Demonstrator Kit:**

With standard Specifications and with the following features.

- TV Receiver in open form with all components and controls placed on a single PCB
- Each circuit block shown in different colour for easy identification
- Solder less fault creation and rectification
- Legend printed on PCB
- More than 50 Test points
- Compact design - sliding Main board with locking facility
- Can be used as desktop colour TV
- Fully documented student workbook and operating manual with TV glossary of terms.
- Manual and remote control operation

## **12. Specifications for Logic Analyzer:**

With standard Specifications and with the following features.

- 68 logic analyzer channels
- 4 GHz timing
- 32 M deep memory
- 450 MHz maximum clock rate
- 500 Mb/s maximum data rate

### **13. Specifications for Power Meters:**

1. Ranges :  $10\mu\text{W}/100\mu\text{W}/500\mu\text{W}$   
 $1\text{mW}/100\text{mW}/500\text{mW}$

With other standard Specifications

### **14. Specifications for Digital Logic Trainer:**

Digital logic trainer (TTL) / logic Trainer board (based on 74 series) Specifications

01. Output D.C. Voltage : fixed 5v and 0 - 18v.
02. Output current : 1 amp.
03. Load regulation : 1% of the highest specified output voltage.  
(no load to full load)
04. Ripple and noise : less than 2 mV.
05. Variable clock frequency : 1 Hz to 1 MHz by three frequency range & multiplier.
06. Logic inputs : 16 switches for high/low
07. Output indicators : 16, 5 mm bright red leds.
08. Seven segment display : 4 digit seven segment display with decoder driver.
09. Digital voltmeter : digital dc voltmeter range 0 - 20v.
10. Operating conditions : 0 to 40c and 95% R.H. At 40c.
11. Bread board : unique solder - less large size, spring loaded breadboard consisting of 2 terminal strips With 640 tie points each and 4 distribution strips with 100 tie points each, totaling to 1680 tie points.
12. Input voltage : 230V 10% at 50 Hz a.c. Mains.

### **15. Specifications for Analog Communications Lab Trainer Kits:**

1. Amplitude modulation and demodulation.
2. Diode detector characteristics.
3. Frequency modulation and demodulation.
4. Balanced modulator.
5. Pre-emphasis & de-emphasis.
6. Characteristics of mixer.
7. Digital Phase detector.
8. Phase locked loop.
9. Synchronous detector.
10. SSB system.
11. Spectral analysis of AM and FM signals using spectrum analyzer.
12. Squelch Circuit.
13. Frequency Synthesizer.
14. AGC Characteristics

1. Amplitude modulation and demodulation.

Built in

- ❖ Power supply
- ❖ Carrier generator with fixed frequency (100 KHz or More) and any fixed amplitude.
  
- ❖ Audio frequency generator with variable frequency from 10Hz to 20 KHz and varying amplitude.
- ❖ Amplitude modulator circuit.
- ❖ Amplitude demodulator circuit.

2. Diode detector characteristics.

Built in

- ❖ Power supply
- ❖ Carrier generator with variable frequency (10Hz to 1 MHz) and any fixed amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20 KHz and varying amplitude.
- ❖ Amplitude modulator circuit.
- ❖ Amplitude demodulator circuit.

3. Frequency modulation and demodulation.

Built in

- ❖ Power supply
- ❖ Carrier generator with fixed frequency (50 KHz or More) and any fixed amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20 KHz and varying amplitude.
- ❖ Frequency modulator circuit.
- ❖ Frequency demodulator circuit.

4. Balanced modulator kit.

Built in

- ❖ Power supply
- ❖ Carrier generator with variable frequency (10Hz to 1 MHz) and any fixed amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20 KHz and varying amplitude.
- ❖ Frequency modulator circuit.

5. Pre-emphasis & de-emphasis.

Built in

- ❖ Power supply.
- ❖ Pre-emphasis circuit using passive elements.
- ❖ De -emphasis circuit using passive elements.
- ❖ Signal generator with variable frequency from 10Hz to 1MHz and variable amplitude.

6. Characteristics of mixer kit.

Built in

- ❖ Power supply.
- ❖ Two R.F generators with variable frequency (10Hz to 1MHz) and variable amplitude.
- ❖ Transistor mixer circuit (including smoothing filters).

7. Digital Phase detector.

Built in

- ❖ Power supply.
- ❖ Signal generator with variable frequency from 10Hz to 100KHz and variable amplitude.
- ❖ Phase shift generator kit.

8. Phase locked loop.

Built in

- ❖ Power supply.
- ❖ Signal generator with variable frequency from 10Hz to 100KHz and variable amplitude.
- ❖ Phase locked loop circuit with variable pots for changing the center frequency.

9. Synchronous detector.

Built in

- ❖ Power supply.
- ❖ Signal generator with variable frequency from 10Hz to 150KHz and variable amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20KHz and varying amplitude.
- ❖ AM/ Balanced modulator circuit.
- ❖ Synchronous detector circuit.

10. SSB system.

Built in

- ❖ Power supply.
- ❖ R.F generators with variable frequency (10Hz to 1MHz) and variable amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20KHz and varying amplitude.
- ❖ SSB modulator circuit using phase shift method.
- ❖ SSB de modulator circuit.

11. Spectral analysis of AM and FM signals using spectrum analyzer.

Built in

- ❖ Power supply.
- ❖ R.F generators with variable frequency (10Hz to 1MHz) and variable amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20KHz and varying amplitude.

12. Squelch Circuit.

Built in

- ❖ Power supply.
- ❖ R.F generators with variable frequency (10Hz to 1MHz) and variable amplitude.

- ❖ Audio frequency generator with variable frequency from 10Hz to 20KHz and varying amplitude.
- ❖ AM/ FM modulator & demodulator circuit.
- ❖ Squelch comparator with level control.

### 13. Frequency Synthesizer.

Built in

- ❖ Power supply.
- ❖ Signal generator with variable frequency from 10Hz to 100KHz and variable amplitude.
- ❖ Frequency synthesizer circuit.

### 14. AGC Characteristics

Built in

- ❖ Power supply.
- ❖ R.F generators with variable frequency (10Hz to 1MHz) and variable amplitude.
- ❖ Audio frequency generator with variable frequency from 10Hz to 20KHz and varying amplitude.
- ❖ AM/ FM modulator & demodulator circuit.

## **16. Specifications for Digital Communications Lab Trainer Kits:**

1. Pulse Amplitude Modulation and demodulation.
2. Pulse Width Modulation and demodulation.
3. Pulse Position Modulation and demodulation.
4. Sampling Theorem – verification.
5. Time division multiplexing.
6. Pulse code modulation.
7. Differential pulse code modulation.
8. Delta modulation.
9. Frequency shift keying.
10. Phase shift keying .
11. Differential phase shift keying.

#### 1. Pulse Amplitude Modulation and demodulation.

- ❖ Built in fixed power supplies of +12v @ 250mA.
- ❖ 555IC timer as a RF generator with 400KHz fixed frequency.
- ❖ The modulation is controlled with a CMOS sampling switch 4016IC.
- ❖ BC-107 is used for demodulation in CE configuration.

2. Pulse Width Modulation and demodulation.
  - ❖ Built in fixed power supplies of +12v,-12v @ 250mA.
  - ❖ 555IC is used as clock generator with fixed frequency of 20 KHz and fixed amplitude.
  - ❖ LM324-ic is used as AF generator with fixed frequency of 500Hz and variable amplitude.
  - ❖ 555IC is used as modulator and Op-Amp 324 IC is used as demodulator.
3. Pulse Position Modulation and demodulation.
  - ❖ Built in fixed power supplies of +12v,-12v @ 250mA.
  - ❖ 555IC is used as clock generator with fixed frequency of 20KHz and fixed amplitude.
  - ❖ LM324-ic is used as AF generator with fixed frequency of 500Hz and variable amplitude.
  - ❖ 555IC is used as modulator and Op-Amp 324 IC is used as demodulator.
4. Sampling Theorem – verification.
  - ❖ Built in fixed power supplies of +12v,-12v @ 250mA.
  - ❖ Variable clock frequency 3-30 KHz (Low) and 6-60 KHz (High).
  - ❖ 4016IC is used for sampling and LM 324IC used for reconstructing the signal.
  - ❖ Additional op-Amp and CMOS are provided for external use.
5. Time division multiplexing.
  - ❖ In built carrier generator.
  - ❖ Three different frequency data signals are generated by using 74163IC.
  - ❖ Built in fixed power supplies of +5v,-5v @ 250mA.
  - ❖ Modulation and demodulation are individually provided on board by using 4051IC.
6. Pulse code modulation.
  - ❖ Built in fixed power supplies of +12v,-12v, +5 @ 500mA.
  - ❖ Variable AF generator 20Hz to 150Hz.
  - ❖ Clock generator fixed frequency of 10 KHz.
  - ❖ Data output with LED variations.

- ❖ Variable DC voltage -5v to +5v.
  - ❖ ADC 800IC, 74LS 165IC are used in modulation.
  - ❖ 74LS164IC, 74LS374IC (Buffer), DAC 800IC and LPF are used in demodulation.
7. Differential pulse code modulation.
- ❖ Variable AF generator 15Hz to 30Hz.
  - ❖ Variable DC voltage -5v to +5v.
8. Delta modulation & Demodulation.
- ❖ Built in fixed power supplies of +12v,-12v, +5v @ 500mA.
  - ❖ 555IC is used as clock generator.
  - ❖ TL084IC is used as AF generator.
9. Frequency shift keying Modulation & Demodulation.
- ❖ Built in fixed power supplies of +12v,-12v, +5v, -5v.
  - ❖ 4051 IC for modulator circuit.
  - ❖ 8038IC for carrier generator.
  - ❖ 7490IC for data generator.
  - ❖ 324IC for demodulator.
10. Phase shift keying Modulation & Demodulation.
- ❖ Built in fixed power supplies of +12v,-12v, +5v @ 500mA.
  - ❖ 8038IC is used as carrier generator 7490IC is used as data generator.
  - ❖ 4051 IC, 324IC are used in demodulator circuit.
  - ❖ 7486IC is used in demodulator circuit.
11. Differential phase shift keying Modulation & Demodulation.
- ❖ Built in fixed power supplies of +12v,-12v, +5v @ 500mA.
  - ❖ 8038IC is used as data generator.
  - ❖ 7490IC for data generator.
  - ❖ 4051IC, 7474IC, 7411IC are used in modulator.
  - ❖ 7486IC is used in demodulator circuit.

**ABSTRACT OF**  
**SCHEDULE – E.5**

**Electronics & Communication Engineering Department**

**Split – Air Conditioning Units for Seminar Hall and ECE Labs.**

Schedule No	Name of the Equipment	Quantity
E.5	. Split Air- Conditioning Units (2.0 Ton) with Accessories	12

**Estimated Cost Rs. 3,60,000=00**  
**EMD Amount Rs. 7,200=00**

Following page gives detailed specifications.

**SPECIFICATIONS OF**  
**SCHEDULE – E.5**

**Electronics & Communication Engineering Department**

**Split Air – Conditioners Units ( 2.0 Ton) with following specifications and Accessories**

**Specifications**

- Cooling capacity - 2.0 Ton
- Operating Voltage - 230 VAC
- Frequency - 50 Hz
- Phase - Single Phase

**Accessories**

- Stabilizer
- Remote control
- AC –box with 3 top pin, with MCB(6x4)

***Requirements***

Make and model : To be specified by the Vendor  
Warranty : One year comprehensive on-site warranty

- Note:
1. The length of the card connecting AC's to power point should be at least 2.0mts. (in case length of the wire required is more than 2m, it should be provided by the vendor only)
  2. The price quoted should include transportation and installation charges at customer site.

# ABSTRACT OF SCHEDULE – E.6

## Mechanical Engineering Department

### Thermal Engineering Lab

Schedule No	Name of the Equipment	Quantity
E.6	Thermal Engineering Lab Morse Test on IC engine	1

**Estimated Cost Rs. 3,20,000=00**

***EMD = Rs 6400/-***

Following page gives detailed specifications.

# **SCHEDULE – E.6**

## **Thermal Engineering Lab**

### **(A) Morse Test on IC engine**

Engine: Four stroke four cylinder Petrol engine test rig to develop 35 to 40BHP at 4500-5000 rpm

Make & Version: Multi Point Fuel Injection (MPFI) of Multi cylinder petrol engine to conduct the Morse test along with performance test and heat balance (with exhaust gas calorimeter), with digital indicators for fuel rate, air, power, temp and rpm

Loading: Coupled to AC alternator (standard brand) with resistance rheostat loading insulation of ceramic type, alternatively quote for Eddy current dynamometer of standard make

Note: If the Computerized version of the above facility is available please quote separately.

# ABSTRACT OF SCHEDULE – E.7

## Mechanical Engineering Department

### Solid Mechanics Lab

Schedule No	Name of the Equipment	Quantity
E.7	<b>SOLID MECHANICS LAB Equipment</b> TORSION TESTING MACHINE <b>Capacity : 100 kg.mS</b>	1

**Estimated Cost Rs.2,20,000=00**

***EMD = Rs 4400/-***

Following page gives detailed specifications.

## SCHEDULE – E.7

### **SOLID MECHANICS LAB**

TORSION TESTING MACHINE – Electric operated, Jaw holding for round and square rods

**Capacity : 100kg.m**

## ABSTRACT OF SCHEDULE – E.8

### Mechanical Engineering Department

#### Metrology Lab

Schedule No	Name of the Equipment	Quantity
E.8	<b>Metrology Lab</b> A. Measurements of profile using Optical Projector.	1
	B. Measurements of Profile using tool Maker's Microscope:	1

**Estimated Cost Rs.4,50,000=00**

***EMD = Rs 9000/-***

Following page gives detailed specifications.

## SCHEDULE – E.8

### METROLOGY LAB

**a) Measurements of Profile using Optical Projector.**

**Standard make of Profile Projector with all standard accessories.**

**Basic model with magnification 10x, Rotary**

**Protractor with 2' of arc, Profile illumination,**

Screen Diameter- 360 mm, Top plate size - 350mm x 260mm.

Measuring Traverse – X-axis : 200mm, Y- axis: 100mm

Profile illumination- Tungsten halogen lamp 24V, 150W.

**b) Measurements of Profile using Tool Maker's Microscope :**

**Tool Maker's Microscope of standard make** along with standard accessories such as Eye piece 15x, Objective 2x, Reticule 90° broken cross hair, Power cable, User's manual etc and including recommended accessories such as Micrometer head 25mm each one For X and Y Axis and rectangular gauge block-2 pieces.

## ABSTRACT OF SCHEDULE – E.9

Mechanical Engineering Department

### Machine Tools Lab

Schedule No	Name of the Item	Quantity
E.9	1) Simple Lathe	3
	2) Heavy Duty Lathe	1
	3) Turret Lathe	1
	4) Milling Machine along with Vertical Attachment	1
	5) Universal Tool and Cutter Grinder	1
	6) Shaping Machine	1
	7) Slotting Machine	1
	8) Radial Drilling Machine	1
	9) Gear Hobbing Machine	1

Estimated Cost Rs.46,20,000=00

*EMD = Rs 92,400/-*

Following page gives detailed specifications.

# SCHEDULE – E.9

## **MACHINE TOOLS LAB**

Note: Where ever the accessories are required, they should be quoted separately.

### *SPECIFICATIONS OF MACHINES*

#### **01. SIMPLE LATHE**

Length of bed	1370mm
Width of the bed	235mm
Centre height	165mm
Admit betn centres	765mm
Spindle hole	42mm
Swing over bed	315mm
Swing over carriage	230mm
Power	1

#### **02. HEAVY DUTY LATHE**

Turning via lathe bed	510mm
Turning via side	300mm
Turning without bed bridge	738mm
Bed width	350mm
Distance between centres	1500/2000
Spindle bore	D1-8/80mm
Spindle speed	25-1600rpm

#### **03. TURRET LATHE**

Specifications	
Model	TCL-255
	MM
Maximum Collect Capacity	25
Spindle Hollow	32
Number of Spindle Speeds	3
Range of Spindle Speeds (rpm)	650-1660
Effective Stroke of Capstan Slide	95
Bore Sizes in Hex Turret	25
Center of Holes above turret slide	40
Maximum Distance between spindle nose to Turret Face	275
Cross Slide Traverse Travel	110
Cross Slide Longitudinal Travel	150
Length of Bed	980
Width of Bed	150
Height of Center above Bed	150
Floor space required	750 x 1300
Approx. weight of the machine (kgs)	750
Packing Case Size	800 x 1300 x 1300

#### 04. KNEE TYPE MILLING MACHINE ALONG WITH VERTICAL ATTACHMENT

<b>Table</b>	
Table overall size	1340*250
Table clamping area	975*250
No./width of 'T' slots	3/14
Center distance between 'T'	63
Longitudinal movement-power	600
Longitudinal movement-manual	700
Cross traverse power	230
Cross traverse manual	250
Vertical movement power	375
Vertical movement manual	400
<b>MILLING SPINDAL</b>	
Spindle nose taper	ISO-40
Quill movement	-
Swivel of milling head	-
<b>SPEEDS</b>	
Speed	12
Speed range standard	35-1500
Speed range optional	45-2000
<b>FEEDS</b>	
Feed	9
Feed range longitudinal& cross feed range	20-800
Vertical	10-400
<b>RAPID TRAVERSE</b>	
Longitudinal& cross	1000
Vertical	500
<b>DISTANCE</b>	
Spindale center to table surface(min/max)	-
Spindale center to lower face of over arm	-
Spindle face to table surface (min)	75
<b>POWER</b>	
Spindle motor	2.25/3
Feed motor	1.5/2

#### 05. UNIVERSAL TOOL AND CUTTER GRINDER

<b>SPECIFICATION</b>	
Swing Over Table	200mm
Longitudinal Traverse	250mm
Cross Traverse	175mm
T-slot Width	10mm
Table Dimension	500x113mm
Admit between Centre	300mm
Table top to grinding wheel maximum	262mm

Table swivel Clockwise	90 degrees
Table swivel Anticlockwise	45 degrees
Motor	½ hp/440 volts/2800 rpm
Height on cabinet	5'
Weight approximately	450 kgs

### 06. SHAPING MACHINE

Max stroke	500
Max distance table to Ram Ram	385mm
Min distance table to Ram	40mm
Max travel of tool Slide Slide	160mm
Max swivel of tool head	60L 60RMM
Max size of tool shank accomd	25*25mm
Ram speed	3 nos
Ram speed in case of all geared	4 nos
Table feed in Horz direction	3 nos
Range of table feed in horz direction	0.2to 0.6
Main drive motor	2
Lenth of cross slide	810mm

### 07. SLOTTING MACHINE

<b>Specifications</b>	
Length of stroke max.	325
Working stroke	300
Ram adjustment	250
Length of ram bearing	625
Throat adjustment	500
Max. dia meter accommodated when machine at center	850
Height between table and height	450
Longitudinal feed(manual)	450
Longitudinal feed(auto)	425
Cross feed(manual)	400
Cross feed(auto)	375
Dimension of table	600
Dimension of base plate	1050*550
Number and range of speed	3(25-40-65)
Motor recommended(960 rpm)	3 H.P

### 08. RADIAL DRILLING MACHINE

Drilling capacity	40mm
Dist. Spindle axis to column generating line	320-1020mm
Dia of column	200mm
Spindle travel	240mm
Spindle speed	6/75-1220rpm
Max.dist.spindle nose to working surface of base	320-900mm
Dimension	400*400*350mm
Power	2hp

## 9. Gear Hobbing Machine

<b>Specifications</b>	
Maximum Module/D.P. Cut	4 Module
Maximum width cut of Spur Gear	350mm
Maximum width cut of Helical Gear	
Helix angle 15	200mm
Helix angle 30	175mm
Helix angle 45	150mm
Distance between Hob Spindle & Surface of Table	
Min. with bellows	127mm
Max. without bellows	350mm
Axial distance between Table & Hob spindle	0 to 175 mm
Hob speed Range (rpm)	35/50/60/90/115/140
Range Axial Feeds of Hob slide	0.2 mm to 4 mm
Machine dimension l x w x h	1500x1000x1555 mm
Weight of machine	1500 kgs. (approx)
Main drive motor	1.1 kw
Rapid Motor	0.36 kw
Coolant pump	0.11 kw

# **ABSTRACT OF SCHEDULE – E.10**

## **Mechanical Engineering Department**

**CAD/CAM Lab - Soft Ware**

<b>Schedule No</b>	<b>Name of the Item</b>	<b>Quantity</b>
E.10	1. ANSYS 11.0 or latest version	5 seats

**Estimated Cost Rs.4,50,000=00**  
***EMD Rs.9,000/-***

Following page gives detailed specifications.

## **SCHEDULE – E.10**

### **CAD/CAM Lab - SOFTWARE**

#### **ANSYS 11.0 or latest version**

ANSYS DesignSpace Capability - Entry level structural & thermal physics capability product that uses our ANSYS Workbench environment. A subset of ANSYS Mechanical capability.

ANSYS Mechanical capability - Structural & thermal physics capability, linear & non linear, steady state, harmonic, modal & transient. ANSYS Mechanical is a subset of ANSYS Multiphysics.

ANSYS Multiphysics capability - Structural, thermal, CFD (FLOTTRAN) & electromagnetics (low & high frequency).

ANSYS CFX Full Capability Solver - The complete CFX fluid dynamics capability (excluding RIF Flamelet library).

ANSYS FLUENT - FLUENT fluid dynamics capability (Excludes V2F & Immersed Boundary modules).

ANSYS AUTODYN (2D & 3D) (Explicit dynamics) - Nonlinear dynamics of solids, fluids, gas and their interactions.

ANSYS LS-DYNA (Explicit dynamics) - Explicit dynamics capability for simulating rapid time transient, nonlinear phenomena such as metal forming processes or crash/impacts.

ANSYS ASAS (All modules except Concrete & Panel) - offshore structural finite element system with integrated modules.

ANSYS AQWA (All modules) - hydrodynamic assessment of all types of offshore/marine structures.

## ABSTRACT OF SCHEDULE – E.11

Schedule No	Name of the Item	Quantity
E.11	UV-VIS Spectrophotometer	1

Estimated Cost Rs.4,50,000=00

*EMD Rs9,000/-*

## E.11 UV-VIS Spectrophotometer Specifications

Microprocessor based UV-VIS Spectrophotometer with high resolution LCD display and dedicated soft key pad for operation on 220 V/50hz. Standalone operation or complete control through computer with UV-Probe computer software as standard.

Photometric system spectral	Double beam
Wavelength	< 0.1 nm
Wavelength range	190 nm to 1,100 nm
Spectral bandwidth	High resolution of 1 nm over entire wavelength
Wavelength accuracy	$\pm 0.1$ nm for D <sub>2</sub> spectral line
Wavelength reproducibility	$\pm 0.1$ nm
Wavelength setting and display	0.1nm
Variable wavelength scanning speed	3,000 nm/min to 2 nm/min
Photometric range	-4 to +4 Abs and 0 to 400 %T
Photometric Accuracy	$\pm 0.002$ Abs at 0.5 Abs
Photometric Repeatability	$< \pm 0.001$ Abs at 0.5 Abs
Baseline drift	0.0003 Abs/hour
Baseline flatness	$\pm 0.0006$ Abs over entire wavelength
Photometric noise	$< 0.00005$ Abs
Light source	Dual source – high intensity Tungsten-Halogen and Deuterium lamp with automatic changeover
Monochromatic	Aberration corrected concave blazed holographic grating in Czerny – Turner mounting for high energy throughput
Detector	pair Silicon Photodiode
Ports	5 USB ports for computer and printer connectivity, data storage and transfer through USB pen drive
Power requirement	AC 220 V/50hz
Sample compartment	Large sample compatible with range of accessories
Software	PC based required software

## B) Library Books

Schedule No	Name of the Furniture	Estimated No. of Titles	Estimated No. of copies	Estimated Amount(Approximate cost)
<b>LB-1</b>	Books for College Library (List of Books is given in below)	986	5836	<b>15,00,000=00</b>

EMD Rs. 30,000/-

**JAWARAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**

**COLLEGE OF ENGINEERING :: PULIVENDULA**

**Text books for Library (Dept wise list)**

### Department of Mechanical Engineering

S.No	Name of the Title	Author	Publisher	No.of copies
1	Automotive Mechanics Vol.1	Kripal Singh		5
2	Automotive Mechanics Vol.2	Kripal Singh		5
3	Automotive Mechanics	G.B.S.Narang		5
4	Automobile Engg.	R.B.Gupta		5
5	Automotive Engg	Newton Steeds&Garrett		3
6	Automobile Engg.	William Crouse		3
7	Automotive Mechanics	Heitner		3
8	Automotive Engines	Srinivasan		3
9	Automobile Engg.	K.K.Ramalingam	Scitech	5
10	Advanced Machining Processes	V.K.Jain	Allied Pub.	5
11	Modern Machining Processes	Pandey,P.C.&Shah	TMH	5
12	New Technology	Battacharya,A.	Institute of engineers	5
13	Elements of Production Planning and control	Samuel Eilon		5
14	Modern production/ Operations Management	Baffa & Rakesh		3
15	Operations Management	S.N.Chary		3
16	Inventory control theory and practice	Mortin.K.Starr& David W.Miller		3
17	Reliability Engg. And quality engg.	Dr.C.Nanda Muni Reddy& Dr.K.Vijay Kumar Reddy	Galgotia pub. Pvt Ltd	3

18	production control quality Approach	John E.Biegel		3
19	production control	Moore		3
20	Operations Management	Joseph Monks		8
21	Operations Management	Schrodder	TMH	5
22	Automation production systems and computer integrated manufacturing	Groover,M.P.	Pearson	5
23	computer control manufacturing systems	Yoram Coreom		5
24	CAD/CAM/CIM	Radhakrishnan		2
25	Automation	W.Bueainshan		3
26	Total Quality Management	Joseph & Susanburk		5
27	Quality Management	Howared Gilto	TMH	3
28	Industrial Robotics	Groover,M.P.	Pearson	5
29	Robotics	Fu,K.S.	M.H.	5
30	Robotics and control	Mittal,R.K.& Nagrath,I.J.	TMH	5
31	Robotic Engg.	Richard,D.Klafter	Prentice-Hall	5
32	Introduction to Robotics	John,J.Craig	Pearson	5
33	Robot Dynamics and control	Spong & viyasagar	John wiley	5
34	Industrial engg. Management	Ravi sankar	Galgotia	5
35	Manufacturing organization and management	Amrine	Pearson	5
36	Management	Stoner, freeman & gilbert	Pearson	3
37	Manufacturing Science and Technology	K.Varaprasad Rao	New Age International	5
38	Machine Tools	Dr.R.Kesavan	University Science Press	3
39	CAD/CAM Principles and Applications	Dr.R.Kesvan, B.Vijaya Ramath	University Science Press	3
40	Heat Transfer (A Conceptual approach)	P.L.Sharma	New Age International	5
41	Heat and mass Transfer	Rajput	Lakshmi Publication	5
42	Engineering Mechanics	P.K.Bansal	Lakshmi Publication	5
43	A First Course in the Finite Element Method	Paryl.L.London	Cengage Learning	5
44	Finite Elements in Engineering	Tirupathi R.Chandraputla Ashok	S.Chand	5
45	Mechanical Measurements & Control	D.S.Kumar	D,S,Kumar.	5
46	Heat and mass Transfer	Sachdev	New Age International	5
47	Engineering Thermodynamics	P.K.Nag		5
48	Operation Research	S,d, Sharma	KNRN	5
49	Robotics	Groover	TMH	5

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88	Manufacturing Engg & Technology	Serope Kalpakjain	Addison Wesley longman	10

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96	Design and Analysis of Experiments	Douglas.C.Mongome	John Willey & Sons	5
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99	Fundamentals of Finite Element Analysis	David.V.Hutton	Tata Mc Graw Hill	3
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23	elements of discrete mathematics	liu c. l.	new york : mcgraw-hill	8
24	database systems: the complete book	hector garcia-molina, jeffrey d. ullman, jenniferwidom	prentice-hall, 2002	8
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124	html & xhtml-step by step	women		5
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256	distributed systems – principles and paradigms	andrew s. tanenbaum, maarten van steen	phi	5
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3	Embedded Microcomputer Systems	Jonathan W. Valvano,	Brooks /Cole, Thompson Learning	05
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126	ATM Networks	Rainer Handel, Manfred N. Hubber, Stefan Schroder	Pearson e	3
127	High Speed Networks & Internets	William Stallings	Pearson Education	3
128	High performance Communication Networks	T. Walrand & P. Varaiy	Harcourt Asia Publications	3
129	MSP430 Microcontroller Basic	John H Davies	Newnes	3
130	Embedded Systems Design Using the TI MSP430 Series	Chris Nagy	Elsevier	3
131	Analyzing and Developing Real-Time Code: Texas Instruments	Lewin Edwards	Newnes	3

	Msp430 and Arm9 Using Rowley Crossworks			
132	analog and digital circuits for control system applications: using the tmsp430 microcontroller	gerald luecke	newnes	3
133	fuzzy logic and control: software and hardware applications	jamshidi, mohammed; vadiee nader;	prentice hall	2
134	fuzzy logic with engineering applications timothy j.	ross,	wiley india	2
135	intelligent control: fuzzy logic applications	by de silva,	c.w. crc press	2
136	a first course in fuzzy logic by nguyen,	h.t.; walker, e.a.	crc press	2
137	arm system developer's guide: designing and optimizing system software	by andreq n.sloss dominic symes chris wright	morgan kaufmann publishe rs	2
<b>TOTAL</b>				<b>470</b>

### Department of Electrical & Electronics Engineering

S.No	Name of the Title	Author	Publisher	No.of copies
1	Engg. Electromagnetic	Hayt	Mc Graw Hill	20
2	Electromagnetic Field Theory	Gangadhar	Khanna	10
3	Transmission lines Networks	Umesh Sinha	Satya Prakashan	03
4	Power Electronics Devices converters Applications	Subrahmanyam	New Age	10
5	Modern power Electronics	Nad mohan	---	10
6	Micro Processor & Interfacing	Hall	TMH	10
7	Essentials of VLSI Circuits and systems	Eshraghian &	PHI	15
8	Modern VLSI design	Wolf	Pearson	10
9	Principles of cmos VLSI design	Weste	Pearson	15
10	Theory and performance of electrical machines	J.B.Gupta		10
11	Electrical power Generation, Transmission & Distribution	S.N.Singh		10
12	Modern control engg.	Katsuhiko Ogata		10
13	Linear integrated circuits	Roychoudhury	New Age	10
14	Op-Amps and linear integrated circuits	Ramakanth, A. Gayakwad		10
15	Elements of power station design and practice	M.V.Deshpande	Wheeler pub.	10
16	Microprocessor and interfacing	D.V.Hall	TMH	10
17	Advanced microprocessors	Ray & Bulchandi	TMH	10
18	The 8086 microprocessors architecture, programming and applications		Thomson	10
19	Electrical and Electronic	a.k.shawney		10

	measurements and instrumentation			
20	Electronic instrumentation	H.S.Kalsi	TMH	05
21	Fundamentals Of Power System Protection	Paithankar &S.R.Bhide		10
22	Switchgear and protection	Sunil,S.Rao	Khanna	10
23	Principles of CMOS VLSI design	West & Eshraghian		10
24	Utilization of Electrical Energy	G.C.Gaug		10
25	Utilization of Electrical Energy	Partav	Khanna	10
26	A.C. Machines	Rajput		05
27	Electrical Machines	B.R.Guptha		05
28	Electrical Machines -1	Kamakshiah	Right	10
29	Electrical Machines -2	Kamakshiah	Right	10
30	Electrical Machines -3	Kamakshiah	Right	10
31	Power Semi Conductor Drives	Vedam Subramanyam		10
32	Power Electronic	Bhimra	Khanna	05
33	Electrical power	Uppal		10
34	Utilization of Electrical Energy	Taylor		10
35	Question Bank in Electrical & Electronic Engineering	J.B.Gupta		05
36	Generation of Electrical Engineering	Desh pande		10
37	Reactive Power Control Theory (Vol. No 6)	T.J.E Muller		15
38	Facts device	Acha	Pearson	15
39	Power System Operation and control	S.Sivanagaraju	Pearson	15
40	Computer Methods in Power Systems	Stag & E.I.Abid	MGra-Hill	15
41	Electrical distributions Systems	Threen green	MGra-Hill	15
42	Electrical Power Drives	G.K.Dubey	Narosa	15
43	Computer Methods in power Systems	L.P.Singh		15
44	Power System Stability control	Anderson & Found		15
45	Understanding Fact & Devices	Narayan,G.	IEEE Press	15
46	Power System Dynamics	K.R.Padiyar		15
47	H V D C Transmission	K.R.Padiyar		15
48	Power System Stability-Analysis by the direct method of Lyapunov	M,A,Pai	North Holland company	15
49	Understanding FACTS,	N.G.Hingorani and L.Guygi	IEEE Press	15
50	Power System control and Stability	Anderson & Found	Galgotia Publication Vol-1	15
51	Power System Protection static relay	T.S.Madhava Rao	Tata McGraw Hill	15
52	Power System Protection and Switchgear	Badri Ram, D.N.Vishwakarma	Tata McGraw Hill	15

53	Modern Control Engineering,	K. Ogata	Prentice Hall, India	15
54	Control Systems,	N. K. Sinha ,	New Age International	15
55	Reliability Evaluation of Engineering Systems	Roy Billinton and Ronald N. Allan	Pitman Advanced Publishing Program	15
56	Energy management	W.R. Murphy & G. Mckay Butter worth	Heinemann publications	15
57	Energy efficient electric motors	John, C. Andreas	Marcel Dekker Inc. Ltd	15
58	The Intel Microprocessors, Architecture, Programming and interfacing	Barry B.Brey,	Prentice Hall Higher education	15
59	Microprocessor and Interfacing Programming and Hardware	Douglas V. Hall	Greg Community college Division	15
60	The 8088 and 8086 Microprocessor	W.A. Triebel & Avtar Singh	PHI,	15
60	Power Generation Operation and control'	Allen J.Wood and Wollenberg B.F	John Wiley & Sons	15
62	Power System Optimization	D.P.Kothari & J.S.Dhillon	PHI,	15
63	Power System Generation, Operation and Control	Allen J. Wood and Bruce Woolenberg	John Wiley and Sons	15
64	Power System Analysis	John J. Grainger and William D Stevenson Jr	McGraw Hill	15
65	Operation of Restructured Power System	Kankar Bhattacharya, Math H.J. Boller and Jaap E.Daalder	Kulwer Academic Publishers	15
66	Restructured Electrical Power Systems	Mohammad Shahidehpour and Muwaffaq alomoush	Marcel Dekker, Inc.,	15
67	Power System Restructuring and Deregulation	Loi Lei Lai	John Wiley & Sons Ltd.,	15
68	Digital Signal Processing	S.K. Mitra	Tata McGraw-Hill,	15
69	Continuous and Discrete Time Signals and Systems, Cambridge,	M. Mondal and A Asif,		15
70	Digital Signal Processing- Fundamentals and Applications	Li Tan,	Indian reprint, Elsevier,	15
71	Reliability Evaluation of Power Systems, Plenum Press	Roy Billinton and Ronald N. Allan	New York and London	15
72	EHVAC Transmission Engineering,	R. D. Begamudre,	New Age International (p) Ltd	15
73	HVAC and DC Transmission.	S. Rao,		15
74	Reactive Power Control in Electric Power Systems,	.J.E.Miller,	John Wiley and Sons,	15
75	Reactive power Management, (Units V to VIII).	D.M.Tagare,	Tata McGraw Hill, 2004	15
76	Non-conventional Energy Sources,	G.D.Rai,	Khanna Publishers, New Delhi,	15
77	A Course in Power Plant Engineering,	Arora and Domkundwar	Dhanpat Rai and Sons,	15
78	Understanding FACTS devises	N.G.Hingorani &	IEEE press	10

		L.Guygi		
79	High Voltage direct current transmission	K.R.Padiyar	Wiley Eastern Ltd	10
80	Power generation &Control	Allen J. Wood	John Wiley&Sons	10
81	Power system Optimization	D.P.Kothari J.S.Dhillon	PHI Publications	10
82	Power System Protection static relay	T.S.Madhava Rao	Tata Mc Graw Hill Publication	10
83	Power System Protection and switch gear	Badriram &D.N.Viahwakaarya	Tata Mc Graw Hill Publication	10
84	Energy conversion system	RokeshDasBegamudre	New age international publications	10
85	Energy Management Load book	W.C. Tuner	John Wiley& Sons	10
86	Energy Management	W.R.Murphy& G.MckeyButler worth	Heinemann publication	10
87	Neural Networks, Fuzzy logic, Genetic Algorithm: Synthesis and application	Rajasehkaran&Pai	PHI Publications	10
88	Modern Control System theory	M.Gopal	New Age international	10
89	Modern Control Engineering	Ogate.K.	Prentice Hall	10
90	Power System Control & Stability	P.M.Anderson A.A.Padiyar	Galgotia Publications	10
91	Power System Stability	M.A.Pai	North Holland Publishing Company	10
92	Power System Dynamic (Stability & Control)	K.R.Padiar	B.S. Publications	10
93	Reactive Power Management	D.M.Tagore	Tata Mc Graw Hill Publication	10
94	Reactive Power Control in Electric Power Systems	T.J.E.Miller	John Wiley&Sons	10
95	Neural and Fuzzy Systems	N.Yadaiah S,Bapi Raju	Pearson	10
96	Extra High Voltage AC Transmission Engineering	Rokesh Das	Willey Eastern Limited	10
97	Advanced Microprocessor and interfacing	A.K.Ray& Bruchandi	Tata Mc Graw Hill	10
98	Electrical Power System	I.J.Nagarath D.P.Kothari	Tata Mc Graw Hill	10
99	Power System Engineering	I.J.Nagarath D.P.Kothari	Tata Mc Graw Hill	10
<b>TOTAL</b>				<b>1183</b>

### Department of Bio-Technoloy

S.No	Name of the Title	Author	Publisher	No.of copies
1	Mass Transfer Operations III ed	Robert, E	M.H International	6
2	Transport Process & Unit Operations, 3ed	Christi, J. Geankoplis	Prentice Hall India Pvt. Ltd	6
3	Bioprocess Engineering Principles	P. M. Doran	Academic Press 1995	2
4	Separation Processes II ed	Judson Kind	M. H Chemical Engg, Series.	6

5	Controlled Separations	Philip C. Wankat Rate	Chapman and Hall, 1985	2
6	Textbook of Environmental Studies for Undergraduate Courses	Erach Bharucha	University Grants Commission	10
7	Textbook of Environmental Sciences and Technology	M. Anji Reddy	BS Publication	5
8	A Biologist Guide to Principles and Techniques of Practical Biochemistry IIIed	Keith Wilson, Kenneth H. Goulding	ELBS Series	6
9	Instrumental Methods of Analysis	Ewing,	1990	6
10	Instrumental Methods of Analysis	Hobert H Willard D. L. Merritt & J.R. J. A. Dean	CBS Publishers & Distributors, 1992	6
11	Short Protocols in Molecular Biology, 2 <sup>nd</sup> ed	T. M. Ausuber, R. E. Kingston, D D. Moire, J. G. Seidman, J. A. Smith, K. Struhl Green	Publication Associates and Jon Wiley and Sons 1991	2
12	Molecular Cell Biology, Media Connected	Lodish, H. Berk A. Zipursky, S.L. Matsudaria, P. Baltimore D. and Damell, J. 2003	W.H. Freeman and Company	2
13	Bio Chemistry and Molecular Biology	William H. Elioff	Oxford Publications	2
14	Cell and Molecular Biology	Philip Sheeler Donald E. Bianchi Wiley	Wiley Publishers	2
15	Nanotechnology	Mark Ratner and Daniel	Pearson Education	6
16	Introduction to Solid State Physics	C. Kittel	Wiley Eastern Ltd	2
17	Materials Science and Engg,	V. Raghavan	Prentice- Hall India	2
18	Nano-materials	A. K. Bandyopadhyay	New age I.N.P	6
19	Bioprocess Engg,	M. L. Shuler and F. Kargi	PHI,1992	6
20	Biochemical Process Principles	P. M. Doran	Academic Press, 1995	2
21	Biochemical Engg, Fundamentals, 2 <sup>nd</sup> ed	Bailey Ollis	Mc Graw- Hiall, 1986	4
22	Fundamentals of Biochemical Engg,	A. V. N. Swany	B. S. Publication 2007	6
23	Bioinformatics- Sequence and Genome Analysis	Daid W. Mount	CSHL Press	6
24	Bioinformatics and Functional Genomics	Jonathan Pevsner	A Jhon Wiely & Sons, Inc. Publication	6
25	Computational Analysis of Biochemical Systems	E. O. Voit	Cambridge University Press 2000	6
26	Protein Engg,	Moody P C E and A J Wilikinson	IRL Press	6
27	Proteins	Creighton T E	W H Second ed, 1993	6
28	Proteomics	BRANDOND TOOZE		6
29	Chemical Reaction Engg, 3 <sup>rd</sup> ed	O. Levenspiel	Wiley Newyork, 1992	6
30	Introduction to Biochemical Engg,	D. G. Rao	McGraw- Hill, 2005	4

31	Bio reaction Engg, Principles 2nd ed,	Jens Nielse, Johan Villadsen Gunner lider	Springer 2007	2
32	Unit Operations of Chemical Engg, 5 <sup>th</sup> ed	W. L. Mc Cabe and JC Smith	Mc Graw Hill, 1993	2
33	Transport Phenomena in Bioprocesses	Verlag	BIOTOL Series	2
34	Biosensors for Analytical Monitoring	KR Rogers	EP & Biosensors Year	6
35	Process Systems Analysis and Control	Donald R. Coughanowr	Mc Graw- Hill, 1991	6
36	Instrumentation	Donal Eukman	New Agepren, Delhi	6
37	Automatic Process Control	Eckman, D. P. Wiley Eastern Ltd .	Wiley Eastern Ltd. New Delhi. 1993	2
38	Chemical Process Control Stephanopoulos	G. PrenticeHall	New Delhi 1990	2
39	Essential Immunology Vaccines Conventional, Subunit and Recombinant, Antidiotypic Vaccine	E. Roitt	Blackwell Scientific Publications, Oxford, 1991	6
40	Kuby Immunology 5 <sup>th</sup> ed	Richard A. Goldsby, Thomas J. Kindt Barbara A. Osborne	W H Freeman and Company	15
41	Immunology A Short Course	Benjamin E and Leskowitz , S.	Wiley LISS NY	4
42	Culture of Animal Cells (3 <sup>rd</sup> ed) F1	Ian Froshney	Wiley- Liss	6
43	Animal Cell Culture- Practical Approach, Ed	Jhon R. W. Masters	OXFORD	6
44	Animal Cell Culture Techniques Ed	Martin Clynes	Springer	6
45	Cell Growth and Division: A Practical Approach. Ed	R. Basega	IRL Press	6
46	Food Biotechnology	Roger A.,Gordan B and John T.	1989	6
47	Food Microbiology	Frazier	-----	6
48	Modern Food Microbiology	James M. J.	CBS Publishers & Distrbutors. 1987	6
49	Biopharmaceuticals: Biochemistry & Biotechnology	Gary Walsh	John Wiley & Sons	4
50	Remington's pharmaceutical Sciences		Mark pub.	4
51	Theory & Practice of Industrial Pharmacy	Leon Lachman	Lea & Febiger	4
52	Bio-Physical Sciences	Upadyaya	-----	10
53	Genes & Crop Bio-Technology	Crisprrls,M.J	----	05
54	Current Protocols in Molecular Biology	Maniatis	-----	02
55	Two Pulse how Heat transfer	J.G.Collier	-----	02
56	Modeling and Control In	J.R.Leigh	----	02

	Bioprocess			
57	Plant Bio-Technology	Giri & Archana Giri	----	03
58	A. Machine Learning approach	P.Baldi & S.Brunak	M.L.T.Press	02
59	A. Practical Guide to the Analysis of Genes & Proteins	Andrew D. Basevani's	----	02
60	Mass Transfer Separation	Binay K.Dutta		10
61	Computational Analysis of Bio-Chemical System	E.O.VOIT		06
62	Proteomics	Brandond tooze	-----	04
63	Immunology	Geoff	-----	04
64	Elements of Chemical reaction Engineering	H.Scott Fogler	----	05
65	Culture of Animal Cells	Ian Froshney	-----	05
66	Animal Cell Culture Techniques	Clynes, Springer	---	05
67	Food Processing & Preservation	-----	P.H.I	05
68	Food Chemistry	Meyer		05
69	Principles of Food Science	Fennema	----	05
70	Pharmaceutical Sciences	Revingten's	----	05
71	Process heat transfer	Donald.kern.	---	05
72	Introduction to Modern Virology	Dermock N.J & Primose S.B.	Blackwell	20
73	Bio-ethics and Bio-safety	M.K.Sateesh	I.K.International	20
74	Fundamentals of biochemical Engineering	A.V.N.Swamy	B.S.P.Publication	10
<b>TOTAL</b>				<b>392</b>

### Department of Chemistry

S.No	Name of the Title	Author	Publisher	No.of copies
1	Engineering Chemistry	Prof.K.N.Jayaveera	Tata Mc.G	30
2	Engineering Chemistry (Revised)	Jain & Jain	Dhanapat Rai	10
3	Engineering Chemistry (Revised)	S.S.Dara	S.Chand	10
4	Environmental Studies	J.P.Sarma	Lakshmi Pub	10
5	Environmental Studies	Agarwal		10
6	Environmental Studies	Barucha		10
7	Environmental Studies	Benny Joseph	TM.H.	10
8	Engineering Chemistry	Dr.K.B.Chandra Sekhar, Dr.U.N.Das	Scitech Publication	15
9	Engineering Chemistry (VOL 1 & 2)	J.C.Kuriacose, Rajaram	T M H	15
10	Applied Chemistry	G.D.Gesser	Springer 2000	15
11	Environmental Studies	Koushik	New Age International	15
12	Chemistry & Manual	Dr.K.N.Jayaveera	S.M.Enter Presser	15
13	Vogel's Book of quantities In organic Analysis	Vogel	ELBS	15
14	Environmental Chemistry	B.K.Sharma		15
<b>TOTAL</b>				<b>195</b>

**Department of Physics**

<b>S.No</b>	<b>Name of the Title</b>	<b>Author</b>	<b>Publisher</b>	<b>No.of copies</b>
1	Engineering physics	V.Rajendran & K.Thyagarajan	T M H	20
2	Engineering physics	M.R.srinivasan	NEW age	10
3	Engineering physics	P.k.Palanisamy	Scitch pub.	10
4	Engineering physics	Mittal	I.K.international	10
5	Engineering physics	S.Maninaidu	Perarson Education	10
6	Modern Engineering physics	K.Vijaya kumar & S.Chandralingam	S.Chand	5
7	Physics Vol.2	Halliday,Resnick&Krane	John Wiley India	5
8	Fundamentals of Physics	Halliday,Resnick &Walker	Wiley India	5
9	Introduction to Nano science & Nano technology	K.Chattopadhyay &A.N.Banarjee	PHI	5
10	Solid State Physics	David W. Swore	Pearson Ed.	5
11	Principles of Nanotechnology	Phani Kumar	Scitech Pub.	5
12	Nano:- The Essentials	T. Pradeep	Tata Macgraw Hill	5
13	Nano materials	A.k. Bandhhyopadhyay	New Age International	5
14	Nanotechnology: Principles Practices	S. K. Kurt Kari	Capitol Pub.	5
15	University Physics	Benson	Wiley India Hd	5
16	Nano-Technology	Booker	Wiley	5
17	Physics Vol.1	Halliday	Wiley	5
18	Introduction to Nano-Technology	Poole	Wiley	5
19	Physics	Cutnell & Johnson	Wiley	5
<b>TOTAL</b>				<b>130</b>

**Department of Humanities & Social Sciences**

<b>S.No</b>	<b>Name of the Title</b>	<b>Author</b>	<b>Publisher</b>	<b>No.of copies</b>
1	Enjoying Everyday English	A. Rama Krishna Rao	Sangam	20
2	Inspiring Lives	J.Ravindranath,M.Sarat babu	Maruthi	20
3	English Grammar in Steps	D. Bolton & N. Goody	Cambridge	05
4	English Grammar Practice	R.N. Bakshi	Sangam	05
5	Express Way to English	B.K.Das	Sangam	05
6	Spoken English a Foundation Course	K. Sadanand & S.Punitha	Sangam	05
7	Strengthen Your Writing	V.R. Narayana Swamy	Sangam	05
8	A Manual for English Language Laboratories	D. Sudha Rani	Pearson	20
9	Basic Communication Skills W/CD	Rajeevan	Cambridge	05
10	Introduction to English Phonetics and Phonology	Aslam	Cambridge	05
11	A Hand Book for English	Kumar Sure	Cambridge	05

	Language Laboratories			
12	Study Skills in English Student's Book	Wallace	Cambridge	05
13	English in deprived Circumstances	Amitravalli	Cambridge	05
14	Write to Communicate	Nagaraj	Cambridge	05
15	Cambridge Idioms Dictionary		Cambridge	05
16	English to Telugu Dictionary	Sankar narayana		05
17	Telugu to English Dictionary	-		05
18	Management Science	Rama Murthy	New Age	05
19	Management Science	A.R. Aryasri	TMH	20
20	Industrial Management	S. Bhaskar	Anuradha	10
21	Managerial Economics	Mithani	Himalaya	02
22	Managerial Economics	P.L. Mehatha	S. Chand	03
23	Management Concepts	V.S.P. Rao	Excel Pub.	02
24	Management and Organization Behavior	K. Subha Rao	Himalaya	04
25	Managerial Economics	Yogesh Maheswary	P.H.I	05
26	MEFA	A.R.Arya Sree	T.M.H.	20
<b>TOTAL</b>				<b>201</b>

### Department of Mathematics

S.No	Name of the Title	Author	Publisher	No.of copies
1	Engg. Mathematics 1,2/e	Rukmangadachari & Kesava Reddy	Pearson	20
2	Engg. Mathematics III	Rukmangadachari & Kesava Reddy	Pearson	20
3	Mathematical Methods	Rukmangadachari	Pearson	05
4	Intro. To Mathematical Statistics 6/ed	Hogg	Pearson	05
5	Probability and Statistics for engineers 8/ed	Walpole	Pearson	05
6	Calculus, 3/ed	Strauss	Pearson	05
7	Thomas Calculus, 11/ed	Weir/ Thomas	Pearson	05
8	Differential Equations and Boundary Value Problems: Computing and Modeling, 3/ed	Edwards	Pearson	05
9	Ordinary Differential Equations Using MATLAB, 3/ed	Polking	Pearson	05
10	Graph Theory	Agnarsson	Pearson	05
11	Discrete Mathematics	Akerkar	Pearson	05
12	Discrete and Combinatorial Mathematics,5/ed	Grimaldi/Ramana	Pearson	05
13	Engg. Mathematics	Alex	Pearson	05
14	Engg. Mathematics, 3/ed.	Croft	Pearson	05
15	Advanced Engg. Mathematics, 2/ed	Greenberg	Pearson	05
16	Fundamentals of Complex	Saff	Pearson	05

	Analysis			
17	A Friendly Introduction to Numerical Analysis	Bradie	Pearson	05
18	Applied Mathematical Methods	Dasgupta	Pearson	05
19	Applied Numerical Analysis,7/ed	Gerald	Pearson	05
20	Time Series Analysis: Forecasting & control, 3/ed.	Box	Pearson	05
21	Probability and Statistical inference	Hogg/Rao	Pearson	05
22	First Course in Probability, 6/ed.	Ross	Pearson	05
23	Intro. To Topology: Pure and Applied	Adams	Pearson	05
24	Engg. Mathematics	Viramanikyam et.al	Scitech	05
25	Transforms & Practical differential Equations	Viramanikyam et.al	Scitech	05
26	Complex Analysis	Arumugam et,al	Scitech	05
27	Numerical Methods for Engineers	Arumugam et,al	Scitech	05
28	Engg. Mathematics	Chitra	Scitech	05
29	Graph Theory	Geetha	Scitech	05
30	Remedial Mathematics	Indrani Khelkar	Scitech	05
31	Discrete Mathematics	Mittal	Scitech	05
32	Mathematical Foundations	Rizwan	Scitech	05
33	Linear Algebra with its applications, 3/ed.	Bretscher	Scitech	05
34	Mathematical Methods	Suryanarayana Rao	Scitech	05
35	Fundamentals of Engg. Mathematics-I	Dass,H.K. & Rama Verma	S.Chand	05
36	Fundamentals of Engg. Mathematics-II	Dass,H.K. & Rama Verma	S.Chand	05
37	Fundamentals of Engg. Mathematics-III	Dass,H.K. & Rama Verma	S.Chand	05
38	Operations Research	Guptha,P.K. & Hira, D.S.	S.Chand	05
39	Solved Problems in Operational Research	Guptha,P.K. & Hira, D.S.	S.Chand	05
40	Basic Engg. Math's (M.P.)-III	Dass,H.K.	S.Chand	05
41	Advanced Engg. Mathematics	Dass,H.K.	S.Chand	05
42	Basic of Engg. Math's	Dass,H.K.	S.Chand	05
43	Concepts of Engg. Math's vol.1	Dass,H.K.	S.Chand	05
44	Applied Mathematics	Ch.V.Ramana Murthy,N.C.Srinivas	S.Chand	05
45	Introduction Methods to Numerical Analysis	S.S.Sastry	PHI	05
46	Advanced Engg. Mathematics	Sastry	PHI	05
47	Applied Numerical Methods	Gourdin & Boumahrat	PHI	02
48	Numerical Methods 2/ed.	Kanda swamy,P. &Tilagavathi,K.	S.Chand	05

49	Numerical Methods for Scientific and engg. Computation	Jain,S.R.,Iyengar R.K.Jain	Wiley Eastern Ltd.	05
50	A text book of Engg. Mathematics vol.1	Iyengar,T.K.V.	S.Chand	05
51	A text book of Engg. Mathematics vol.2	Iyengar,T.K.V.	S.Chand	05
52	Mathematical Methods	Iyengar,T.K.V.	S.Chand	20
53	Ordinary and partial Differential Equations	Raisinghania,M.D.	S.Chand	05
54	Advanced Differential Equations	Raisinghania,M.D.	S.Chand	05
55	Fundamentals of Engg. Mathematics-I	B.Sooryanarayang	S.Chand	05
56	Fundamentals of Engg. Mathematics-II	B.Sooryanarayang	S.Chand	05
57	Fundamentals of Mathematical Statistics	Guptha,S.C.	S.Chand	05
58	Engg. Mathematics-I	B.V.Ramana	TMH	20
59	Mathematical Methods	B.V.Ramana	TMH	20
60	Engg. Mathematics-I	Dr. C.Sankaraiah	UNI-Tech Series	10
61	Mathematical Methods	Dr. C.Sankaraiah	UNI-Tech Series	10
62	Higher Engg. Mathematics	Grewal,B.S.	Khanna pub.	05
63	Numerical Methods for Science and engg.	Grewal,B.S.	Khanna pub.	10
64	Elementary Engg. Mathematics	Grewal,B.S.	Khanna pub.	05
65	Classical Mechanics	Sankar Rao	PHI	02
66	Classical Mechanics: Analytical Dynamics	Tiwari & Thakur	PHI	02
67	Computer Oriented Numerical Methods	Rajaraman	PHI	10
68	Discrete Mathematical Structures	Kolman ,Busby&Ross	PHI	05
69	Discrete Mathematical Structures	Somasundaram	PHI	02
70	Discrete Mathematics & Graph Theory	Biswal	PHI	05
71	Engg. Mathematics vol.1	Sastry	PHI	05
72	Engg. Mathematics vol.2	Sastry	PHI	05
73	Finite Element Methods: Basic Concepts and Applications	Chennakesava R.Alavala	PHI	02
74	Finite Element Procedure	Bathe	PHI	02
75	Numerical Methods for Mathematics, Science and engg.	Mathews	PHI	02
76	Numerical Methods using MATLAB,4/ed.	Mathews & Fink	PHI	02
77	Text book of engg. Mathematics: special functions of complex variables	Bathul	PHI	05
<b>TOTAL</b>				<b>456</b>

**DETAILS OF TOTAL NUMBER OF BOOKS**

<b>Department</b>	<b>Total No. of Copies</b>	<b>No. of Titles</b>
M.E	455	100
CSE	2354	440
ECE	470	137
EEE	1183	99
Bio-Tech	392	74
Chemistry	195	14
Physics	130	19
Humanities	201	26
Mathematics	456	77
<b>Grand Total</b>	<b>5836</b>	<b>986</b>