PAPER-IV: 2231 PHYSICS PRACTICAL

The distribution of marks in the practical examination will be as follows:

(i) Two experiments 48 Marks

For each experiment, distribution of marks will be as follows:

Figure : 3

Formula/Theory : 3

Observation : 10

Calculation(including error) and Result : 6

Precautions : 2

(ii) Viva voce 12

(iii) Records 15

Total 75 Marks

MAX. MARKS :75

Students are expected to perform sixteen experiments in all taking eight from each section. One experiment from Section A and one from Section B shall be set in the examination paper.

List of Experiments

Important Note:

(i)Before starting experiments, students should be taught errors in measurement, propagation of errors, importance of significant figures, identifying variables in experiment, importance of graphical presentation of data. Results without quoting errors should not be approved.

(ii) Students should be exposed to Internet and Computation facilities. College should install at least one computer in the Physics Laboratory and students should be encouraged to make use of computers to access tutorials related to experiments, access educational resources from Internet and to plot graphs.

Section-A

1 Determination of the size of the Lycopodium grains using Cornu's method.

2. Determination of wavelength of Mercury light using grating

3. Determination of resolving power of grating

4. Determination of dispersive power of the glass prism

5. Determination of wavelength of sodium light using Fresenel's biprism

6. Determination of wavelength of sodium light using Newton's rings

7. Determination of specific rotation of cane sugar solution using polarimeter.

8. Determination of wavelength of ultra sonic wave.

9. Determination of focal length of a high power microscope objective.

10. Measurement of absorption by a solution.

11. Study of aberrations of a thick lens.

12. Study of interference fringes in thin films of the following (not all)

(a) Thermal expansion of a crystal using interference fringes.

(b) Bending of a glass plate under load.

(c) Bending of a rod under load.

(d) Use of Newton's ring to determine the radii of curvature of surfaces.

(e) Use of fringes in wedge film .

13. Resolving limit of the eye and of a telescope with a variable aperture.

14. Fresnel   diffraction at a straight edge and a slit.

15. Fraunhoffer diffraction at a single slit.

16. Resolving limits of grating and prism.

17. Study of polarization of the light by simple reflection.

18. Verification of Cauchy's relation using Prism and Grating.

19. Familiarization with Schuster`s focussing; determination of angle of prism.

20. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
21. To determine the value of Cauchy Constants of a material of a prism.
22. To determine the wavelength of Laser light using Diffraction of Single Slit
23. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Section-B

1. To draw characteristic curves of Common emitter transistor and calculate its hybrid parameters.

2. To study gain and frequency response of a single stage Common emitter amplifier.

3. To determine varactor diode characteristics.

4. To draw characteristics of Zener diode and calculate voltage regulation factor.

5. To study ripple factor and internal resistance of a solid state power supply using LR,CR and Pi filter using a CRO

6. To find barrier height of a given solid state diode.

7. Use of p-n junction for the measurement of temperature.

8. Design and construction of phase shift oscillator.

9. Design, build and test of a lograithimic amplifier.

10. Study of a function generator using Operational Amplifier.

11. Study of NAND and NOR circuits (discrete and IC) XOR and De Morgans Theorem.

12 Study of multiplixures and demultiplexures.

13 Study of half adder and full adder circuit.

14. Study RS, D and JK flip - flops.

15. Study of Modulo- 3 , Modulo-5 and Modulo-7 binary counter circuits.

16. Study of characteristics of a thermistor.

17. Determination of solar constant or temperature of an oven through radiation measurement.

18. Resistance thermometry: temperature of a torch bulb filaments from R value, platinum resistance thermometry.

19. To measure (a) Voltage, and (b) Frequency of a periodic waveform using a CRO

20. To minimize a given logic circuit.

21. Half adder, Full adder and 4-bit Binary Adder.

22. Adder-Subtractor using Full Adder I.C.

23. To design a monostablemultivibrator of given specifications using 555 Timer.

24. To design a CE amplifier of a given gain (mid-gain) using voltage divider bias.

25. To study a precision Differential Amplifier of given I/O specification using Opamp.

26. To investigate the use of an op-amp as a Differentiator

27. To design a Wien Bridge Oscillator using an op-amp.