

B.SC. Part III Physics (Honours) Practical Examination - 2021

**Kalyani university
Department of Physics
Kandi Raj College**

Subject: Physics (Hons.)

Full Marks: 80

Time: 4 Hrs.

Paper: X

Answer any eight of the following questions :

10×8=80

1. a) Define Interference of Light.
b) Write down the Cauch's relation. How can you find the value of constants of this relation ?
c) Define dispersive power of a material.
d) How does deviation depend upon on the angle of prism ?
e) What kind of image is formed by the telescope ?

2+(1+2)+2+2+1

2. a) What are the apparatus required in Fresnel Biprism Experiment?
b) Explain the theory to determine the wavelength of monochromatic light by Fresnel's Biprism.
c) Why do you place the prism at minimum deviation position ?

2+6+2

3. a) What is diffraction of Light? What is the condition of Diffraction?
b) What is Fraunhofer diffraction?
c) What formula do you used to determine the intensity of diffracted light in single slit?
d) Why the intensities of diffraction maxima are different?

2.5+2.5+2.5+2.5

4. a) What are the differences between localized and non-localised fringes ?
b) Why do you record the readings of the two verniers ?
c) Is sodium light strictly a monochromatic light ? Explain.
d) What are the conditions for central maxima, secondary maxima and minima ?

2+2+2+4

5. a). Explain the Schuster's method of focusing.
b) Write down the formula for intensity distribution in case of double slit diffraction.
c) What are the differences between single slit and double slit diffraction?
d) What is the necessity of leveling the spectrometer ?

3+2+3+2

6. a) What is Diffraction grating?
b) What is replica grating?
c) What is the formula of intensity in a diffraction grating of N-slits?

- d) How the wavelength of unknown line is measured using transmission grating? 2+2+2+4
7. a) What is Raleigh Criterion of resolution of an optical instrument?
 b) Determine the formula of resolving power of a grating.
 c) What is the resolving power of a telescope? 3+5+2
8. a) What do you mean by optically active substance ?
 b) Define specific rotation . What are the parameters that affect the specific rotation ?
 c) How will you prepare the solution in the polarimeter experiment ?
 d) What is calibration curve of polarimeter for the active solution ?
 e) What do you mean by tint of passage ? 2+2+2+2+2
9. a) How does the deviation of a ray vary with its angle of incidence ?
 b) How will you take the value if the zero of the vernier crosses the zero of the scale during the rotation of telescope or of prism table ?
 c) What are the apparatus used in Newton's ring experiment ?
 d) How are Newton's rings formed ?
 e) What is the difference between division of amplitude and division of wavefront ? 2+2+2+2+2
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Subject: Physics (Hons.)
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Paper: XI
Time: 4 Hrs.

Answer any eight of the following questions :

10×8=80

1. a) What is the use of ballistic galvanometer?
 b) What are conditions for a galvanometer to be ballistic??
 c) Why is it called ballistic galvanometer?
 d) What is the difference between normal galvanometer and ballistic galvanometer?
 e) Why is damping of ballistic galvanometer kept small?
 f) What is the use of Flux meter? 2+2+2+2+1+1
2. Draw the block diagram of an 8085 microprocessor. Write a program in assembly language to multiply two different numbers stored at two different memory locations. 10
3. a) What can be measured by Cathode Ray Oscilloscope?

- b) Sketch a simple diagram of a CRO and explain its working principle?
- c) How is the waveform adjusted by CRO?

2+6+2

4. How can the following circuits be designed and tested with OP-AMPS?

- (i) Differential Amplifier
- (ii) Inverting and non-inverting amplifier

- 5. a) Which bridge is used for measurement of capacitance?
- b) How Wien's bridge is useful in measuring the frequency?
- c) What is the significance of capacitance in Maxwell bridge?
- d) Which principle operates a bridge circuit?
- e) When a capacitor increases the plate area?

2+2+2+2+2

6. How can OR, AND, NOT and NAND gates be constructed using diodes and transistors?

Describe procedures for verification of their truth tables.

10

- 7. a) What are hybrid parameters ? why they are used?
- b) What are the merits and demerits of hybrid parameters?
- c) What is hybrid equivalent model?
- d) What are two port parameters?
- e) What is hybrid model in electronics?

2+2+2+2+2

8. How can the voltage gain, bandwidth, input and output impedance of a single stage common emitter amplifier be measured?

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9. How can the mutual inductance of two coaxial coils be measured at various relative orientations using a ballistic galvanometer?

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10. Describe a suitable experimental arrangement to draw the current voltage characteristics of a zener diode.

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