

**Sample Questions for 5<sup>th</sup> Semester Physics  
Practical Component  
(Written Part)**

**Fresnel Biprism**

1. What is monochromatic light source?
2. What is meant by interference of light?
3. Write down the relation between distance between two virtual sources and either of the acute- angle of the bi-prism.
4. Why the focal length of the lens is so chosen that  $D > 4f$ . Where  $D$  is the distance between source and eye-piece?
5. When will you face the problem of lateral shift of fringes in Fresnel's bi-prism experiment?
6. What adjustment will you do to overcome the problem of lateral shift of fringes in bi-prism experiment?
7. How will you place the bi-prism on the holder, with its plane surface towards the slit or away from of the slit? Why?
8. Can you locate the central fringe of a bi-prism fringe system? How?
9. What will happen if a thin mica sheet is inserted in the path of both of the interfering waves in the bi-prism experiment?
10. When two sources will be said coherent?
11. State the principle of superposition.
12. Why it is required to use narrow slit?
13. Why it is required to perform Shuster's method?
14. What type of eye-piece is used in the telescope of a spectrometer?
15. If the slit width is increased continuously, what will happen to the fringes in the bi-prism experiment?
16. How do the fringes in the bi-prism experiment affected if the angle of the bi-prism is increased?
17. Why does the bi-prism possess two equal but very small acute angles?
18. What is utility of the convex lens used in the bi-prism experiment?
19. Is sodium light is monochromatic? Explain your answer.
20. What should be the range of wavelength for visible colour of light?
21. What type of image is produced by the telescope in a spectrometer?
22. What is optical levelling?
23. Explain with diagram the formation of two virtual images by bi-prism.
24. What will you do to avoid back lash error while using the micrometer screw in bi-prism experiment?
25. Whether the bi-prism fringes are localized or not? Explain.
26. What change in the fringe width will you get if a thin mica sheet is inserted in the path of one of the interfering waves in the bi-prism experiment?
27. What will happen if a thin mica sheet is inserted in the path of one of the interfering waves in the bi-prism experiment?

**Grating**

28. For any given order, how does the angle of diffraction change with wavelength in case of a plane diffraction grating?

29. Write the condition for absent spectra in plane transmission grating.
30. Why the spectral lines in higher order spectra are well separated?
31. Write the advantage of grating spectra over prism spectra.
32. You are given two gratings X and Y of same grating constant. Are they produced principal maxima of same intensity?
33. What are "ghost lines" in grating spectra?
34. Why the grating used in your lab are called replica grating?
35. Draw the intensity profile of grating spectra.
36. Why is it necessary to make the rulings of the grating vertical with respect to the incident beam?
37. What adjustment will you make so that the rulings of the grating become exactly vertical to the incoming beam?
38. What is resolving power of grating?
39. Is resolving power of grating depends on number ruling? How?

**Determination of J by using Callendar-Barnes' apparatus:**

40. Write down the relation between current I and heat H produced in a resistor.
41. Can you explain how heat is generated in the heating coil?
42. Why do you take the heating coil in the form of a twisted/spiral strip?
43. What is the order of resistance of the heating element?
44. Define mechanical equivalent of heat.
45. State the value of J in CGS and SI system.
46. The temperature difference should neither be high nor very low-why?
47. How can you measure specific heat capacity of water or other liquid using this principle?
48. The strength of the current should be high in this experiment-why?
49. Can you determine J by using an alternating source instead of DC?
50. Which quantity in the determination of J, should be measured with utmost care?
51. Can the experiment for determination of J be performed without using a voltmeter?

**B-H Loop**

52. Define the terms: residual magnetism or remanence.
53. Define retentivity of magnetic material.
54. What is meant by hysteresis loss?
55. Draw the hysteresis loop for soft iron and steel.
56. What is the magnetic difference between soft iron and steel?
57. What is the relation between Gauss and Tesla?
58. What is meant by *magnetically hard material*? Give an example.
59. What is the effect of an air-gap within an anchor ring?
60. What is hysteresis loop?
61. Define coercivity of magnetic material.
62. What is the advantage of taking the specimen in the form of ring instead of a rod?
63. Which material out of steel and soft iron would be better for the construction of permanent magnet?
64. Define magnetic induction.

65. What type of material (out of steel and soft iron) will be preferred to construct the *core of transformer*?
66. Some energy is always dissipated during demagnetization process. Where does this energy go?
67. Explain the importance of '*Curie temperature*'.
68. Write the relation among three vectors B, H and I.
69. What is the significance of hysteresis loop?
70. Is the shape or area of the hysteresis loop for soft iron and steel identical?
71. Define magnetic the term intensity of magnetization.
72. Which material out of steel and soft iron would be better for the construction of electromagnet?
73. How one can demagnetize the magnetism of a ferromagnetic material?

### **Anderson's Bridge**

74. Why you perform the dc balance in Anderson bridge?
75. Can you choose any value of C in Anderson's bridge? Explain.
76. Why it is often express the self-inductance in milli-henry (mH) instead of henry (H)?
77. On which physical quantity the self-inductance of the coil depends.
78. What are advantages of Anderson's bridge over other bridge?
79. What do you understand by sensitivity of the bridge?
80. What is non-inductive resistance?
81. Is there self-inductance depends on the types of core used? Explain.
82. Write the condition for ac balance?
83. Why it is advice to choose non-inductive resistance in the Anderson bridge?
84. What is self-inductance of a coil?
85. What do you understand by resistance of a inductive coil.
86. How you calculate the error in this experiment?
87. Why ac and dc detector are different?

### **Q-factor in a Series LCR circuit**

88. In an ac circuit with pure resistor only, what is the phase difference between the current and voltage?
89. Define Q-factor.
90. In a pure inductor what is the phase between current and voltage?
91. In a pure capacitor what is the phase between current and voltage?
92. At resonance, write down the phase difference between current and voltage.
93. How we measure the sharpness of resonance?
94. What is half power frequency?
95. What is acceptor circuit?
96. What is selective circuit?
97. What is inductive reactance? How it varies with applied frequency?
98. What is capacitive reactance? How it varies with applied frequency?
99. Write down the condition when current leads over the applied emf.
100. Write down the condition when circuit becomes purely resistive.
101. Draw the frequency response graph of LCR circuit for three different resistances  $C_1, C_2, C_3$  (where  $C_1 > C_2 > C_3$ )

102. Draw the phasor diagram of LCR circuit.
103. Write down the condition when current lags behind the applied emf.
104. Define bandwidth of the LCR circuit.
105. What is the speciality of the LCR circuit at resonance?
106. Write down the use of a LCR circuit.
107. Draw the frequency response graph of LCR circuit for three different resistances  $R_1, R_2, R_3$  (where  $R_1 > R_2 > R_3$ ).

### **Determination of susceptibility of magnetic material**

108. Define susceptibility of a magnetic material.
109. Give two examples of paramagnetic substance.
110. Out of diamagnetic, paramagnetic and ferromagnetic, which type of material is generally selected for core of a transformer?
111. In which types of material susceptibility become positive?
112. What is magnetic dipole?
113. Which type of material has positive susceptibility?
114. Is there any difference between B and H?
115. Does magnetic susceptibility of a diamagnetic material depend on temperature?
116. Give two examples of diamagnetic substance.
117. What is magnetic saturation?
118. Which type of material has negative susceptibility?
119. Write the relation between magnetic permeability and magnetic susceptibility.
120. Draw the variation of intensity of magnetization (I) with applied magnetic field (H) for ferromagnetic substance.
121. Above certain temperature, the ferromagnetic material behaves like paramagnetic. What is that temperature called?