



**Part B**  
**Answer the following**  
**Answer should not exceed 400 words or two pages**

**5 X 6=30**

- 11.a. What are liquid Helium I and II?. Discuss the important properties of liquid helium II.  
(or)
- 11.b. Explain Meissner effect in superconductors.
- 12.a. Describe the charge sensitiveness of a Ballistic Galvanometer with necessary circuit diagram.  
(or)
- 12.b. Discuss briefly about Antiferromagnetism and Ferrimagnetism.
- 13.a. Discuss the characteristics of Zener diode with neat circuit diagram.  
(or)
- 13.b. Analyze the function of OR gate and AND gate with necessary circuit diagram.
- 14.a. What is photoelectric effect?. State the laws of photoelectric effect.  
(or)
14. b. State and Explain Moseley's law. Give its importance.
- 15.a. Distinguish between spontaneous and induced emission. Explain the phenomenon of Population inversion with neat diagram.  
(or)
15. b. What is Raman effect?. Explain Stokes and anti-stokes lines with neat diagram.

**Part C**  
**Answer the following**  
**Answer should not exceed 800 words or four pages**

**5 x 12=60**

- 16.a. What is Joule Thomson effect?. Discuss K. Onnes method for liquefaction of helium with neat diagram.  
(or)
- 16.b. Describe with the necessary theory, the method of production of low temperature by adiabatic demagnetization of a paramagnetic salt.
- 17.a. Discuss in detail about the measurement of thermo e.m.f. using potentiometer.  
(or)
- 17.b. Compare the properties of dia, para and ferro magnetic materials.
- 18.a. Explain the principle, construction and working of (i) LED (ii) Solar cells.  
(or)
18. b. What do you mean by universal building block?. Prove that NAND gate can act as a Universal building block.
- 19.a. Derive Einstein's photo electric equation and describe Millikan's experiment to verify the same.  
(or)
19. b.(i) Explain the production of X-rays with neat diagram.  
(ii) Derive Bragg's law.
- 20.a. Describe the construction and working of Ruby laser with neat diagram.  
(or)
- 20.b. (i) Discuss the metastable state condition for laser action .  
(ii) Describe Laser Raman Spectrometer with neat diagram.

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