

GANPAT UNIVERSITY

B. TECH SEM-I & II CBCS NEW (All branch)

REGULAR/REMEDIAL EXAMINATION- APRIL-JUNE-2016

2EC101 : Physics

MAX. TIME: 3 HRs

MAX. MARKS: 60

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.

(2) Figures on right indicate marks.

(3) Be precise and to the point in answering the descriptive questions.

(4) Assume suitable data, if necessary.

SECTION: I

- Q.1 (A) What is Doppler's Effect? Derive the expression for change in frequency when source and observer both are in motion and medium at rest. (5)
- (B) Explain laws of Thermodynamics. (3)
- (C) What are the requirements of the good thermometer? (2)

OR

- Q.1 (A) List out Advantages and Disadvantages of optical fiber. (4)
- (B) An observer on a railway platform noticed that when a train passed through the station, at a speed of 72 km/hr, the frequency of the whistle appeared to drop by 500 Hz. Calculate the actual frequency of the note given by the whistle. (3)
- (C) Define following terms: (3)
- 1) Adiabatic process
 - 2) Isothermal process
 - 3) Conical fiber

- Q.2 (A) What is Dispersion? Explain in detail with its types. (4)
- (B) Which of the following statements are true for sound waves? Justify your answer with proper reason. (3)
- 1) Sound waves are symmetric
 - 2) Sound waves are asymmetric.
- (C) Define following terms: (3)
- 1) Absolute zero temperature
 - 2) Mean free path
 - 3) See back effect

OR

- Q.2 (A) Tabulate the difference between Multimode and Single mode fiber. (3)
- (B) Calculate N.A., Acceptance angle and Critical angle if core and cladding refractive indices are 1.38 and 1.36 respectively. (3)
- (C) Explain Joule-Thomson effect. (4)
- Q.3 (A) What is N.A.? Derive it in terms of fractional refractive index. (6)
- (B) Define thermometry. List out types of thermometer and explain each in brief. (4)

SECTION: II

- Q.4 (A) Explain the concept of energy hill for P-N junction diode. (5)
(B) What is meant by doping? What is its significance? How does semiconductor affected when it is doped with donor impurities? (5)
- OR
- Q.4 (A) Describe the construction and operation of Roentgen X-rays tube. List out its defects. (6)
(B) Explain the formation of covalent bond in Germanium crystal. (4)
- Q.5 (A) What is superconductivity? Distinguish between Type-I and Type-II superconductor in tabular form. (6)
(B) Define the terms: Core, Breakdown Voltage, Plasma, Magnetization (4)
- OR
- Q.5 (A) Explain the phenomena of hysteresis observed in magnetic materials. (6)
(B) What is nanotechnology? List out important properties of nanomaterial and its applications. (4)
- Q.6 (A) How many orbiting electron does the Si atom have? (1)
(B) How are ions formed? (2)
(C) Describe diamagnetic and paramagnetic materials with their properties. (5)
(D) Diamagnetic Al_2O_3 is subjected to an external magnetic field of 10^5 A/m. Calculate magnetization and magnetic flux density in Al_2O_3 . (Susceptibility of $\text{Al}_2\text{O}_3 = 5 \times 10^{-5}$) (2)

-----END OF PAPER-----