

Evening  
Date: 17/12/2015

Exam No: \_\_\_\_\_

GANPAT UNIVERSITY  
B. TECH SEM-I & II CBCS(NEW) ALL BRANCHES  
REGULAR/REMEDIAL EXAMINATION- NOV-DEC 2015  
2EC101: PHYSICS

TIME: 3 Hrs.

TOTAL 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.

SECTION: I

- Q.1 (A) List out types of thermometer and explain resistance thermometer in detail. (5)  
(B) A motor car is fitted with two horns, which differ in frequency by 288 vibrations per second. If the car sounding the horns is moving at 30 m.p.h. towards a person, who is at rest, calculate the difference of frequencies of the notes heard by him. (Velocity of sound in air is 1120ft/s). (4)  
(C) Define: 1) critical angle 2) Refractive Index (1)
- OR
- Q.1 (A) Find out the core diameter necessary for single mode operation at 850  $\mu\text{m}$ . Fiber have core and cladding refractive indices of 1.50 and 1.47 respectively. Find N.A. and acceptance angle also. (3)  
(B) Explain transmission of heat. (2)  
(C) Define 1) mean free path 2) absolute zero temp. (2)  
(D) What are the requirements of a good thermometer? (2)
- Q.2 (A) What is Dispersion? Explain in detail with its types. (5)  
(B) Explain classification of fiber with respect to index profile in detail. (5)
- OR
- Q.2 (A) An engine blowing a whistle of frequency 130, moves with a velocity of 90km/hr towards a hill from which a well- defined echo is heard. Calculate the frequency of the echo heard by the driver. Velocity of sound in air is 350m/s. (3)  
(B) What is Thermal conductivity? Derive the equation for it. (4)  
(C) Is sound wave symmetric or asymmetric? Justify your answer with example. (3)
- Q.3 (A) What is Doppler effect ? Explain various case of it when source and observer both are moving. (4)  
(B) What is  $\Delta$ ? Derive N.A. in terms of it. (6)

SECTION: II

- Q.4 (A) What are Semiconductors? Explain in detail the p and n type of Semiconductors. (5)  
(B) Explain the various types of magnetic materials based upon the permanent magnetic dipole moments. (5)
- OR
- Q.4 (A) Differentiate between Insulators, Conductors and Semiconductors. (6)  
(B) Define Superconductors. Explain any two properties of superconductors in detail. (4)
- Q.5 (A) What is biasing of a p-n junction diode? Explain the two-types of biasing method for a p-n junction diode. (6)

(B) Write down the results obtained from the Rutherford's alpha particles scattering experiment. (4)

OR

- Q.5 (A) Draw the Hysteresis loop for a ferromagnetic material and describe the different regions of the loop. (5)  
(B) What are X-Rays? Explain the Roentgen tube method for production of X-Rays. (5)
- Q.6 (A) Why p-bands have slightly higher energy than n-bands. (2)  
(B) Define the term Magnetic flux density (B). (1)  
(C) Write down any two properties of X-Rays. (2)  
(D) Draw the core diagram for Al atom. (2)  
(E) Explain Paramagnetic materials with its properties. (2)  
(F) What is Nanotechnology? (1)

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END OF PAPER  
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