Exam No: _____

GANPAT UNIVERSITY

B. TECH SEM- I CBCS REGULAR EXAMINATION NOV-2014

2EC101 PHYSICS

MAX. 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) Assume suitable data if necessary.

SECTION - I

Q-1 (A) What is the resistance thermometer and give a brief explanation of it. [05]

(B) If the platinum temperature corresponding to 60 °C on the gas scale is 61.56°C, what will be the temperature on the platinum scale corresponding to 195°C on the gas scale? [05]

OR

Q-1 (A) Explain laws of thermodynamics and thermodynamic processes. [05]

(B) The resistance of platinum wire at 0°C, 150°C and 500°C is found to be 5.5, 8.5 and 15.5 ohms respectively. The resistance of a wire is given by the relation $R_t = R_0 (1+\alpha t+\beta t^2)$. Find the value of α and β. [05]

Q-2 (A) Explain each method for how the ultrasonic wave is generated. [05]

(B) Two observers A and B carry identical sound sources of frequency 500 Hertz. If the observer A is stationary and B moves away from A at a speed of 3.6 Km/hr. How many beats per second are heard by A and B respectively. Velocity of sound in air =350m/s. [05]

OR

Q-2 (A) Discuss about application of ultrasonic in detail. [05]

(B) Two aero planes pass each other in opposite directions and one of them is blowing whistle of frequency 560 Hz. Calculate the frequency of the note in the other plane (i) before (ii) after they have passed each other. Velocity of either of the plane is 600 Km/hr and Velocity of sound in air is 350m/s. [05]

Q-3 (A) How many types of magnetic materials are there? Give the description of every material. [05]

(B) Write about following terms: (1)Permeability (2)Magnetic susceptibility (3)Reluctance [05]

SECTION - II

Q-4 (A) With the help of diagram, explain the forward and reverse biased conditions of a p-n junction diode. [05]

(B) Explain the Reflection and the Refraction phenomenon of light. Write down the advantages of optical fiber. [05]

OR

Q-4 (A) Explain in detail the formation of n-type and p-type semiconductors. [05]

(B) What is Numerical Aperture? Derive its expression in terms of the acceptance angle of an optical fiber. [05]

Q-5 (A) Draw the energy band diagram of p-type and n-type material. Also explain Energy hill in brief. [05]

(B) Calculate the refractive index of core and cladding material of a fiber from the following data: N.A.=0.28 and Δ=0.014. [05]

OR

Q-5 (A) Draw the symbol of a p-n junction diode. Also explain an unbiased diode in detail. [05]

(B) Explain the Roentgen tube method for the generation of X-rays [05]

Q-6 (A) Answer the following: [05]

i) Why the P bands have slightly higher energy than the N bands in the energy band diagram of a diode?

ii) Define Reverse saturation current.

iii) Define an atom.

iv) What is Nanotechnology?

v) What is Acceptance cone for an optical fibre?

(B) Classify the optical fibers depending upon the index profile. [05]

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