Exam Seat No:_____   Enrollment No:_____

C.U.SHAH UNIVERSITY
Wadhwan City

Subject Code **4SC02PHC1**   Summer Examination-2014   Date: 28/05/2014
Subject Name:Physics-**II**

Branch/Semester:- B.Sc(Pure Science)/II   Time:02:00 To 5:00
Examination: Regular
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Instructions:-
(1) Attempt all Questions of both sections in same answer book / Supplementary
(2) Use of Programmable calculator & any other electronic instrument is prohibited.
(3) Instructions written on main answer Book are strictly to be obeyed.
(4) Draw neat diagrams & figures (If necessary) at right places
(5) Assume suitable & Perfect data if needed
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SECTION-I

Q-1 a) Define Doppler's effect in light.   (01)

b) What is threshold intensity of sound? Give its value with unit.   (01)

c) Define: Isotopes.   (01)

d) Define: Isotones.   (01)

e) Define: Noise.   (01)

f) Write Bragg's formula for inter-planar crystal spacing ' d ' and   (01)
wavelength ' λ ' of X-rays.

g) Write formula for the Half Life Time ' T_{HL} ' and Decay Constant ' λ ' for   (01)
a radioactive element.

Q-2 a) What are the properties of X-rays?   (05)

b) Define musical sound. Explain characteristics of musical sound.   (05)

c) Calculate sound velocity in water if its bulk modulus is 2.23×10^{9} Pa.   (04)

OR

Q-2 a) A certain crystal reflects monochromatic X-rays strongly when the   (05)
Bragg's 1st order glancing angle is 15°. What are the glancing angles for
the 2nd and 3rd order spectra?

b) Find out radioactive decay constant ' λ ', half life period ' T_{HL} ' and   (05)
mean life span ' $T_{average}$ ' for a radioactive substance if its activity
reduces to 1/10th of its initial activity in 10 years?

c) Differentiate: "Longitudinal Waves"   versus "Transverse Waves''   (04)

Q-3 a) Describe production of X-rays by giving principle construction and   (07)
working of a Coolidge Tube with neat and clean diagram.

b) Describe Laws of radioactivity, in detail.   (07)

OR

Q-3 a) Derive Newton's formula for velocity of sound in air and apply Laplace's   (07)
correction to it. Prove that calculated value of sound velocity in air agrees
with its practical value.

b) Give a comparison of properties of ∝, β and γ radiations.- (07)

SECTION-II

Q-4 a) Define: Anisotropy. (01)
  b) Define: Non Bravais lattice. (01)
  c) Draw and define: Unit cell. (01)
  d) For a C.E. connection of an N-P-N transistor, find the value of Current Gain β, if its Current Amplification Factor α is 0.98 (01)
  e) Define: Ripple Factor - γ. (01)
  f) Draw schematic symbols of LED & Photo Diode. (01)
  g) To which axes is the Miller plane (0 1 0) parallel ? (01)

Q-5 a) What are Miller Indices? Illustrate the steps to find out Miller indices of a crystal plane with necessary diagram. (05)
  b) Explain in brief: Working of a P-N-P transistor. (05)
  c) Discuss in brief: Full wave Center Tap rectifier. (04)

OR

Q-5 a) Write a short note on Zener Diode. (05)
  b) Explain how multi-colour LEDs works? (05)
  c) Differentiate: "Crystalline Solids" versus "Non-Crystalline Solids". (04)

Q-6 a) Explain any one Filter Circuit. (05)
  b) Determine the value of Base Current I_B in Common Base Transistor Configuration if Current Amplification Factor ∝ is 0.95 and the Emitter Current I_E is 1 mA. (02)
  c) What is Bravais Lattice? Describe 14 Bravais lattices of 7 crystal systems with lattice parameters and diagrams. (07)

OR

Q-6 a) Give mathematical analysis of a Full Wave Rectifier. (07)
  b) Describe Common Base Transistor configuration with circuit diagram. Explain current gain ratio ∝, Collector current I_C and; I/P & O/P characteristic curves. (07)

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