Printed Page:- Subject Code:- ACSBS0101

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow)

B.Tech.

SEM: I - CARRY OVER THEORY EXAMINATION - AUGUST 2022

Subject: Physics for Computing Science

Time: 03:00 Hours Max. Marks: 50

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 marks each.
3. Section B - Question No-3 is based on external choice carrying 5 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 4 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A 15

1. Attempt all parts:-

1.a. Energy of SHM always….. (CO1) 1

(a) 0

(b) Decreases

(c) remain conserved

(d) increases

1.b. The polarization of light confirms… (CO2) 1

(a) longitudinal nature of light

(b) dual nature of light

(c) transverse nature of light

(d) none

1.c. In which energy state particle energy is 2 times its ground state energy? (CO3) 1

(a) IInd level

(b) Ist level

(c) IIIrd level

(d) none

1.d. Which crystal system has four Bravais lattices? (CO4) 1

(a) orthorhombic

(b) cubic

(c) trigonal

(d) triclinic

1.e. Zeroth law of thermodynamics deals about (CO5) 1

(a) Temperature

(b) Pressure

(c) Density

(d) Velocity

2. Attempt all parts:-

2.a. What is displacement current? (CO1) 2

2.b. What do you mean by grating and grating element? (CO2) 2

2.c. What is de-Broglie's hypothesis of matter waves? (CO3) 2

2.d. What do you understand by coordination number? (CO4) 2

2.e. What is the first law of thermodynamics? (CO5) 2

SECTION B 15

3. Answer any three of the following:-

3.a. Derive the SHM equation and find the velocity of the particle at any displacement x. (CO1) 5

3.b. Describe and explain the formation of Newton's rings in reflected monochromatic light. (CO2) 5

3.c. Calculate the energy difference between the ground state and first excited state for electron in one dimensional rigid box of length 10^{-8}cm. Mass of electron = 9.1×10^{-31}kg and h = 6.62×10^{-34}j-sec. (CO3) 5

3.d. Find the Miller indices of a set of parallel planes which makes intercepts in the ratio 3a:4b on the x and y axes. And are parallel to Z-axis . a,b,c being primitives. (CO4) 5

3.e. Discuss various types of optical fiber with diagram. (CO5) 5

SECTION C 20

4. Answer any one of the following:-

4-a. In a damped oscillatory motion an object oscillates with a frequency of 1 Hz and its 4

amplitude of vibration is halved in 5 s. Find the differential equation for the oscillation. (CO1)

4-b. Derive the equation of continuity. (CO1) 4

5. Answer any one of the following:-

5-a. What is the difference between interference and diffraction? (CO2) 4

5-b. Discuss ellptically polarised light. (CO2) 4

6. Answer any one of the following:-

6-a. Prove that phase velocity is greater than the velocity of light. (CO3) 4

6-b. Calculate the velocity and kinetic energy of a neutron having de-Broglie wavelength 1Å. (CO3) 4

7. Answer any one of the following:-

7-a. The spacing of the (111) planes of a SC lattice crystal is 1.8 A^0 . What is the spacing of the (100) planes? (CO4) 4

7-b. Explain SC, BCC and FCC lattices of a cubic crystal system. (CO4) 4

8. Answer any one of the following:-

8-a. Explain the construction of Ruby laser with neat and clean diagram. (CO5) 4

8-b. What do you understand by entropy? What does the second law of thermodynamics tells? (CO5) 4