Registration No:

Total Number of Pages :2

B.TECH. DEGREE EXAMINATION-Nov-Dec.2018
End Semester Examination-I Semester
BBSBS 1021-Engineering Physics
(Regulations 2018)(Common to CSE and Mechanical Branches)
Time : 3 Hours   Maximum : 100 Marks   Question Code:31312
Answer ALL Questions

PART-A (10 X 2=20 Marks)	

1. (a) …….times the KE or PE of a simple harmonic oscillator attain its maximum value during one oscillation. a. Two b. Three c. Four d. One	[CO1][PO1]
(b) The graph between the displacement and the velocity of a simple harmonic oscillator is…….. a. sphere b. cylinder c. Ellipse d. cube	[CO1][PO1]
(c) The time period of a DHO is 2 sec. It is subjected to damped force with damping coefficient 1 unit. Its logarithmic decrement will be…… a. 1 b.1.5 c. 2 d. 2.5	[CO1][PO2]
(d) Example of solid lasing material is .... a. $He - Ne$ b. CO_2 c. Ruby d. None	[CO2][PO1]
(e) The working principle of optical fibre is .... a. Reflection b. Refraction c. Diffraction d. Total internal reflection	[CO2] [PO1]
(f) If 0.25, 0.5 and 0.75 are the coordinates of a point on a line, determine the direction indices of the line. a. (3 1 4) b. (4 2 1) c. (1 2 3) d. (2 1 3)	[CO3][PO2]
(g) The smallest volume unit cell in a crystal structure is called as: a. primitive b. fcc c. bcc d. None	[CO3][PO1]
(h) The divergence of a position vector is............... a. 0 b. 1 c. 2 d. 3	[CO4][PO1]
(i) The minimum energy required for photoelectric effect is called.................. a. Stopping potential b. Threshold frequency c. Wave function d. Work function	[CO5][PO1]
(j) The rest mass of a photon is .... a. infinity b. zero c. mass of electron d. None	[CO5] [PO1]

PART-B (10 X 2=20 Marks)	

2.(a) A damped oscillator reduces its amplitude to 1/10 of the original after making 20 number of oscillations. If the time period of the oscillator is 2 sec. then find the relaxation time of the oscillator.	[CO1][PO2]
(b) Graphically show the energy variations with time for a simple harmonic oscillator.?	[CO1] [PO1]
(c) What are the different applications of laser.	[CO2] [PO1]
(d) Give a cross-sectional view of an optical fiber.	[CO2] [PO1]
(e) Define Bragg's law ?	[CO3] [PO1]
(f) Differentiate between conductor, semiconductor and insulator on the basis of band theory.	[CO3][PO1]
(g) State Ampere's circuital law and obtain its differential form.	[CO4][PO1]
(h) State Gauss law in electrostatics and obtain its differential form.	[CO4] [PO1]
(i) Find the de Broglie wavelength of a particle of mass 40 g, moving with speed 1km/s.	[CO5] [PO2]
(j) Define CNT and its classifications.	[CO5] [PO1]

PART-C (4 X 15=60 Marks)	
3. (a) (i) Set up the differential equations for a damped harmonic oscillator. Find the solution for the under damped oscillation. Discuss the three types of damped motion with examples?	[10][CO1] [PO1] [5][CO1][PO1]
(ii) How coherent sources are produced by the division of wave front in case of Newton's ring experiment.	
(or)	[8][CO1][PO1]
(b) (i) Discuss with a neat diagram that how interference fringes are produced in Newton's Ring Experiment and derive the expression for the diameters of the dark and bright rings?	[7][CO1][PO1]
(ii)Discuss the different types of emissions with the help of the energy level diagrams?	[10][CO2] [PO1]
4. (a) (i) Discuss the principle, construction and working of a Semiconductor laser?	[5][CO2][PO1]
(ii) Give five examples of applications of Laser used in different fields?	
(or)	[10][CO2][PO1]
(b) (i) What is an optical fiber? Discuss different parts of an optical fiber? Differentiate between the step-index and graded-index optical fibers? Discuss its advantages and disadvantages?	[5][CO2][PO1]
(ii) Give five examples of Optical Fibers used in communication?	
	[10][CO3][PO1]
5. (a) (i) What is Miller indices? Discuss the method to determine the Miller Indices of a crystal plane? Explain with examples.	[5][CO3][PO1]
(ii) Classify materials on the basis of band theory.	
(or)	[10][CO3][PO1]
(b) (i) Discuss the construction and properties of the reciprocal lattice.	[5][CO3][PO2]
(ii) Determine the reciprocal lattice of Simple Cubic lattice.	[8][CO5][PO1]
6. (a) (i) Using Schrodinger's equation, discuss the case of a free particle in one dimensional potential well. Mention its energy Eigen values of the excited states	[7][CO5] [PO2]
(ii) State Heisenberg's Uncertainty principle .Using Uncertainty principle prove the Non-existence of electron in Nucleus	
(or)	[10][CO5][PO1]
(b) (i) State Einstein's concepts of Photo electric effect. Discuss characteristics of Photoemission.	[5] [CO5][PO2]
(ii) A 10 gm particle moves with a speed of 20m/s. If its position is determined with an accuracy of 1 mm, find the uncertainty in its linear momentum.	
==0==	