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END TERM EXAMINATION

FIRST SEMESTER [B.TECH] MARCH 2023

Paper Code: BS-105 **Subject: Applied Physics-I**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.No.1.which is compulsory. Select one questions from each unit. Assume missing data, if any.

Q1. Answer the following questions:- [3x5=15]

(a) Explain briefly the negative results of Michelson-Morley Experiment?
(b) Give conditions of sustained interference.
(c) Explain continuum Model.
(d) Show that acceleration is invariant under Galilean Transformation.
(e)Define Poynting vector.

UNIT-I

Q2. (a) State and Explain the Second law of thermodynamics. Also give the limitations of first law of thermodynamics. [6+2=8]
(b) Explain Adiabatic process by using first law of thermodynamics. [4]
(c) What is thermal Equilibrium? Explain with example. [3]

Q3. (a) Define thermodynamic variables and its types. Also give examples of each. [5]
(b)Define Entropy .Explain entropy in a Reversible and irreversible process. [10]

UNIT-II

Q4. (a) State and derive Maxwell 3rd Equation in differential and integral form. Also write its significance. [8+2=10]
(b) Derive Energy in SHM. Also give graphical representation of it. [5]

Q5. (a) What is physical meaning of Poynting theorem .Give interpretation.[5]
(b)Deduce the equation for propagation of electromagnetic wave in free space and obtain an expression for the velocity. Show that electric and magnetic field vectors are normal to each other and to the direction of propagation of waves. [10]

UNIT-III

Q6. (a) Define and derive the resolving power and dispersive power of a grating? [6]
(b) In an experiment of Newton's rings, the diameter of 4th and 12th dark rings are 0.400cm and 0.700cm respectively. Calculate the diameter of 20th dark ring. [5]
(c)Describe Fresnel's Biprism. [4]

Q7. (a) Explain the phenomenon of Double refraction. Compare the properties of ordinary and extraordinary rays. [6]
(b)Describe Nicol prism with neat diagram. [5]
(c) In a grating spectrum, which spectral line in 4th order will overlap with 3rd order line of 5461 A^0? [4]

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UNIT-IV

Q8. (a) What do you understand by the "Time dilation"? Discuss its Experimental proof. **[5]**

(b) State fundamental Postulates of special theory of relativity. **[5]**

(c) A rocketship is 50m long,when it is on flight its length appears to be 49.5m to an observer on the ground. Find the speed of the rocket. **[5]**

Q9. (a) What are Einstein's A and B co-efficients? Describe relation between them. **[5]**

(b) Draw the energy level diagram of He-Ne laser. How is it superior to a ruby laser? **[5]**

(c) Define coherence. Distinguish between spatial and temporal coherence. **[5]**

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