1ST SEM. / COMMON / 2022(W)
Th-2(a) Engineering Physics

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions | 2 x 10

   a. What are the basic units in SI System ?
   b. State triangle law of vector addition.
   c. What is the condition for maximum horizontal range for a projectile ?
   d. Define co-efficient of friction.
   e. State Newton's law of gravitation.
   f. Define Simple Harmonic Motion .
   g. State First law of thermodynamics.
   h. Write down laws of reflection.
   i. Three resistors of 2 Ω,4 Ω and 5 Ω are connected in parallel. Calculate the equivalent resistance.
   j. Write down the properties of LASER.

2. Answer **Any Six** Questions | 5 x 6

   a. Check the correctness of the physical equation $v = u + at$ by dimensional analysis.
   b. State laws of limiting friction.
   c. Differentiate between longitudinal and transverse wave.
   d. State and explain Coulomb's law of electrostatics.
   e. State Faraday's laws of electromagnetic induction.
   f. State Kepler's laws of planetary motion.
   g. Explain Total internal reflection with diagram.

3. Derive expressions for Equation of Trajectory, Time of flight and Maximum Height for a projectile projected with initial velocity 'u' by making an angle 'θ' with the horizontal. | [4+3+3]

4. State Kirchhof's laws. Obtain condition of balance for a Wheatstone bridge by applying Kirchhof's laws. | [4+6]

5. How much heat energy is required to convert 7.5 kg of ice at -30° C to a steam at 100° C. Given that the specific heat capacity of ice is 0.5 cal-gm^{-1}- ° C^{-1} , Specific heat capacity of water is 1 cal-gm^{-1}- ° C^{-1} , Latent heat of ice is 80 cal-gm^{-1} and Latent heat of water is 540 cal-gm^{-1}. | 10

6. Establish a relation between α,β and γ where symbols used carry usual meaning. | [10]

7. Write short notes on:- | [5+5]
   (i) Compare Fleming's Right Hand Rule and Fleming's Left Hand Rule.
   (ii) Properties of magnetic lines of force.

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