

Roll No. 

Total No. of Pages : 02

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B.Tech Ind. Engg. &amp; Mgt. (Spl. in TQM) (Sem.-1)

**APPLIED PHYSICS**

Subject Code : IEM-103

Paper ID : [61003]

Time : 3 Hrs.

Max. Marks : 40

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt All EIGHT questions from SECTION-A carrying TWO marks each.
2. Attempt any SIX questions out of EIGHT from SECTION-B carrying FOUR marks each.

**SECTION-A****Q1. Answer briefly :**

- a. What are the advantages of SI system of units?
- b. State and explain Newton's first law of motion.
- c. A truck and a car are moving with same kinetic energy on a straight road. Their engines are simultaneously switched off. Which one will stop at a lesser distance?
- d. State and prove Hooke's law.
- e. State the law of conservation of energy.
- f. State and explain 'Lenz's law'.
- g. Transverse waves are not produced in liquids and gases. Why?
- h. Differentiate between intrinsic and extrinsic semiconductors.

### SECTION-B

- Q2. Explain the need for measurements in physics. What do you know about fundamental and derived units?
- Q3. A force of 0.04 newton acts upon a body. As a result, the speed of the body changes from  $0.30 \text{ ms}^{-1}$  to  $0.10 \text{ ms}^{-1}$ , in passing through a certain distance. Find the distance if the mass of the body is one kilogram.
- Q4. State and explain work energy theorem.
- Q5. Explain surface energy. Establish its relation with surface tension.
- Q6. Discuss the different mechanisms of heat transfer with illustrations.
- Q7. A uniform field of magnetic induction  $\mathbf{B}$  points horizontally from south to north, its magnitude is  $1.5 \text{ Wb/m}^2$ . If a 5 MeV proton moves vertically downward through this field, what force will act on it?
- Q8. What are standing waves? Give important characteristics of standing waves.
- Q9. Explain the operation of a p-n junction in the forward and reverse biased conditions and draw the forward and reverse biased characteristics.