Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 18

B.Tech. (Software Engg.) (Sem.–1)

PHYSICS FOR ENGINEERS-I

Subject Code : EP-1150

M.Code : 77252

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C. have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

SECTION-A

1. Explain the term 'Total Internal Reflection'.
2. Why a broad source of light is necessary for observing colours in thin films?
3. Two equal forces act at a point. The square of their resultant is 3 times their product. Find the angle between them.
4. How does the ball bearing reduce friction?
5. A truck and car are moving with the same kinetic energy on a straight road. Their engines are simultaneously switched off. Which one will stop at a lesser distance?
6. Explain why waves on strings are always transverse?
7. The soldiers marching on a suspended bridge are advised to go out of steps. Why?
8. What are the differences between transverse and longitudinal waves?
9. The speed of sound waves depends on temperature but speed of light waves does not. Why?
10. Differentiate between simple harmonic motion and oscillatory motion.

SECTION-B

11. Find an expression for fringe width in case of Young's double slit experiment. Prove that in this case of interference dark and bright bands are of equal width.

12. What is a uniform circular motion? Explain the terms; time period; frequency and angular velocity. Establish relation between them.

13. a) Calculate the amount of work done in moving a body up a rough horizontal plane.

    b) A machine gun has a mass of 10 kg. It fires 30 gram bullets at the rate of 6 bullets per second with a speed of 400 m/s. What force must be applied to the gun to keep it in a position?

14. a) What are conservative and non-conservative forces, explain with examples.

    b) What is meant by positive work, negative work and zero work? Illustrate your answer with examples.

SECTION-C

15. Find the total energy of the particle executing simple harmonic motion and show graphically the variation of potential energy and kinetic energy with time in simple harmonic motion.

16. Give analytical treatment of formation of standing waves on strings and discuss briefly the normal modes of vibration of strings.

17. Explain Doppler Effect in sound. Obtain an expression for apparent frequency of sound when source and listener are approaching each other.

18. Discuss analytically how standing waves are formed in closed organ pipes. Also discuss normal modes of vibration of the pipes.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.