Everwin Matric. Hr. Sec. School

29.1.2020 Revision Exam –II Marks:70

Std: XI (A-D) Physics Time:3 Hrs

I. Choose the correct answer: 15x1=15

1. Which of the following represents wave _____.

a. $(x-Vt)^3$ b. $x(x+Vt)$ c. $\frac{1}{x+vt}$ d. sin (x+vt)

2. An air column in a pipe which is closed at one end will be in resonance with the vibrating body of frequency 83Hz. Then the length of the air column is _____.

a. 1.5m b. 0.5m c. 1.0m d. 2.0m

3. A mobile phone tower transmits a wave signal of frequency 900MHz-calculate the length of the waves transmitted from the mobile phone tower _____.

a. 0.39 b. 0.30 c. 0.33 d. 0.31

4. The damping force on an oscillator is directly proportional to the velocity. The units of the constant of proportionality are ____.

a. Kg ms^{-1} b. Kg ms^{-2} c. Kg s^{-1} d. Kg s

5. In a simple harmonic oscillation, the acceleration against displacement for one complete oscillation will be ____.

a. an ellipse b. a circle c. a parabola d. a straight line

6. A particle executing SHM crosses point A and B with the same velocity. Having taken 3S in passing from A to B, it returns to B after another 3S. The time period is ____.

a. 15s b. 6s c. 12s d. 9s

7. If the temperature and pressure of a gas is doubled the mean free path of the gas molecular ____.

a. remains same b. doubled c. tripled d. quadrapoled

8. For a given gas molecule at a fixed temperature the area under the Maxwell-Boltzmann distribution curve is equal to ____.

a. $\frac{PV}{KT}$ b. $\frac{KT}{PV}$ c. $\frac{P}{NKT}$ d. PV

9. A typical refrigerator has Cop around ____.

a. 7 to 8 b. 5 to 6 c. 1 to 3 d. 1 to 6

10. In an isochoric process, we have ____.

a. W=0 b. Q=0 c. ΔU=0 d. ΔT=0

11. Which of the following is not a scalar?

a. viscosity b. surface tension c. pressure d. stress

12. If a wire is stretched to double of its original length, then the strain in the wire is ____.

a. 1 b. 2 c. 3 d. 4

13. The poisson's ratio value for stainless steel ____.

a. 0.33 b. 0.27-0.30 c. 0.30-0.31 d. 0.0

14. The workdone by the sun's gravitational force on the earth is ____.

a. always zero b. always positive

c. can be positive or negative d. always negative

15. The kinetic energy of the satellite orbiting around the earth is _____.

a. equal to potential energy b. less than potential energy

c. greater than kinetic energy d. zero

II. Answer the following: [Any 6] 6x2=12

16. If the earth has no tilt, what happens to the seasons of the earth?

17. Define Pascal's law.

18. Let $2.4x10^{-4}$J of work is done to increase the area of a film of soap bubble from $50cm^2$ to $100cm^2$. Calculate the value of surface tension of soap solution.

19. Why two holes are made to empty an oil tin?

20. State Wien's displacement law.

21. Define the term degrees of freedom.

22. Explain resonance. Give an example.

23. Explain red shift and blue shift in Doppler effect.

III. Answer the following: [Any 6] 6x3=18

24. Discuss the law of transverse vibrations in stretched strings.

25. What is meant by angular harmonic oscillation? Compute the time period of angular harmonic oscillations.

26. Write down the 6 postulates of kinetic theory of gases.

27. Explain the heat engine and obtain its efficiency.

28. One mole of an ideal gas initially kept in a cylinder at pressure 1Mpa and temperature 27°C is made to expand until its volume is doubled.

a. How much work is done if the expansion is

(i) adiabatic (ii) isobaric

b. Show each process on a PV diagram

29. Derive an expression for the elastic energy stored per unit volume of a wire.

30. A metal plate of area $2.5 \times 10^{-4} m^2$ is placed on a $0.25 \times 10^{-3} m$ thick layer of castor oil. If a force of 2.5N is needed to move the plate with a velocity $3 \times 10^{-2} m/s$. Calculate the coefficient of viscosting of castor oil.

31. Derive the expression for gravitational potential energy.

V. Answer in detail: [Any 5] 5x5=25

32. Derive the time period of satellite orbiting the earth.

33. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.

34. Obtain Meyer's relation.

35. What is capillarity? Obtain an expression for the surface tension of a liquid by capillary rise method.

36. Discuss in detail the total energy in simple harmonic motion.

37. Show that the velocity of a travelling wave produced in a string is $V = \sqrt{\frac{T}{r}}$.

38. Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace's correction.