Test No. 12   Physics (Chapters 7 to 11)   Class: First Year   Total Marks = 40

Name of the Student: _____

Question No. 1 Encircle the correct option.   (20)

i.   The total distance travelled by an object performing SHM with amplitude A, in time equal to its time period, is
        a. A   b. 2 A   c. 3A   d. 4 A
ii.   A swing is a good example of
        a. electrical resonance   b. mechanical resonance   c. both a&b   d. none of these
iii.   Angular frequency ω is basically a characteristic of
        a. SHM   b. linear motion   c. circular motion   d. vibrator motion
iv.   If source is moving towards the listener apparent frequency
        a. decreases   b. increases   c. remains constant   d. becomes zero
v.   Two tuning forks have frequency 243 Hz and 240 Hz respectively. The beat /s is equal to
        a. 2 Hz   b. 3 Hz   c. 483 Hz   d. zero
vi.   Frequency of second pendulum is
        a. 0.5 Hz   b.0.75 Hz   c. 1 Hz   d. 2 Hz
vii.   X-rays diffraction from the nickel crystal proves ---------- phenomena of x-rays.
        a. particle   b. wave   c. both a&b   d. none of these
viii.   Fringe spacing for red light is --------- the blue light, if 'd' and 'L' are kept constant.
        a. greater than   b. lesser than   c. equal to   d. none of these
ix.   In case of point source, the wave fronts are
        a. circular   b. plane   c. spherical   d. cylindrical
x.   In going from a denser to rarer medium, a ray of light is
        a. un-deviated   b. bent away from normal   c. bent towards normal   d. diffracted
xi.   For glass-air boundary, the value of critical angle is
        a. 37°   b. 41.8°   c. 57°   d. 68°
xii.   The distance between principal focus and the optical center of the lens is called
        a. radius of curvature   b. focal length   c. aperture   d. diameter
xiii.   The value of universal gas constant "R" is
        a. 83.10 J/mol K   b. 83.14 J/mol K   c. 8.143 J/mol K   d. 8.314 J/mol K
xiv.   The internal energy of the gas molecules is equal to
        a. kinetic energy   b. potential energy   c. both a&b   d. zero
xv.   Entropy of melting of ice
        a. increases   b. decreases   c. is zero   d. remains constant
xvi.   When entropy of the system increases, heat energy is
        a. added to the system   b. taken out from the system   c. neither heat is given nor take d. none of these
xvii.   Length of the second's pendulum is
        a. 2m   b. 0.5 m   c. 0.99 m   d. 4 m
xviii. The distance between two consecutive nodes or antinodes in the stationary waves is
        a. λ   b. λ/2   c. λ/4   d. 3 λ/2
xix.   Beats are heard when difference of frequency is not more than
        a. 10   b. 8   c. 6   d. 4
xx.   The lower portion of a wave from the mean level is called
        a. trough   b. amplitude   c. crest   d. wavelength

Question No. 2 Write short answers of any six of the following questions.   2x6=12

i. Name two characteristics of simple harmonic motion.
ii. Explain why sound travels faster in warm air than in cold air.
iii. How would you distinguish between up-polarized and plane-polarized lights?
iv. How light signal is transmitted through optical fibre?
v. Why specific heat at constant pressure is greater than specific heat at constant volume?
vi. Does entropy of a system increase or decrease due to friction?
vii. Define internal energy of the gas molecules.
viii. Define fringe spacing in an interference phenomena.

Question No. 3
a. Define and explain simple pendulum. Also calculate expression for time period and frequency of simple pendulum **(5)**
b.   A car of mass 1300 kg is constructed using a frame supported by four spring s. Each spring has a spring constant 20,000 N/m. if two people riding in the car have a combined mass of 160 kg, find the frequency of vibration of the car, when it is driven over a pot hole in the road. Assume the weight is evenly distributed.   **(3)**

OR

Question No. 4
a. Define specific heat at constant pressure and at constant volume. Also show that Cp>Cv.   **(5)**
b. A telescope is made of an objective of focal length 20 cm and an eye piece of 5 cm, both convex lenses. Find the angular magnification.   **(3)**