

### SECTION 'A' (Multiple Choice Questions)(17)

**NOTE:** i) This section consists of 17 part questions and all are to be answered. Each question carries 1 mark.

ii) Do not copy the part questions in your answer book. Write only the answer in full against the proper number of the question and its part.

iii) The use of scientific calculator is allowed. All notations are used in their usual meanings

1. Select the correct answer for each from the given options:

i) A point charge  $q_1 = 2\mu\text{C}$  is located at a distance 'd' away from another point charge  $q_2 = 6\mu\text{C}$ . The ratio  $\frac{F_{12}}{F_{21}}$  will be:

- \* 1 ✓      \* 3      \*  $\frac{1}{2}$       \*  $\frac{1}{3}$

ii) The work done by a centripetal force is always:

- \* Maximum      \* Half of maximum value  
\* Quarter of maximum value      \* Zero ✓

iii) If the cross-sectional area of a pipe decreases, then the velocity of fluid:

- \* Increases ✓      \* Decreases  
\* Depends on the fluid density      \* Remains the same

iv) The process of superimposing signal frequency on carrier wave is:

- \* Transmission      \* Detection  
\* Reception      \* Modulation ✓

v) A heat sensitive device whose resistivity changes with the change in temperature is called:

- \* Conductor      \* Thermistor ✓  
\* Resistor      \* Thermometer

vi) A ray of light enters obliquely from air into water then these two or three quantities of the following change:

- (a) wavelength      (b) frequency  
(c) speed      (d) direction:  
\* (a), (c) and (d) ✓      \* (a) and (b)  
\* (b) and (d)      \* (b) and (c)

vii) The dot product and cross product of two vectors are equal at this angle:

- \*  $65^\circ$       \*  $45^\circ$  ✓      \*  $76^\circ$       \*  $30^\circ$

viii) The rate of change of linear momentum is:

- \* Force      \* Impulse ✓      \* Torque      \* Power

ix) One Degree ( $1^\circ$ ) is equal to:

- \*  $\pi$  radians      \*  $(\frac{180}{\pi})$  radians  
\*  $(\frac{\pi}{180})$  radians ✓      \*  $2\pi$  radians

x) Dimensions of kinetic energy are the same as those of:

- \* Force      \* Work ✓      \* Momentum      \* Power

xi) A completely submerged object always displaces fluid equal to its:

- \* Weight ✓      \* Volume      \* Density      \* Mass

xii) In Young's double slit experiment when the distance between slits and screen is doubled, while separation of slits is halved, then fringe spacing will be:

- \* 4 times ✓      \*  $\frac{1}{4}$  times      \* doubled      \* unchanged

xiii) A wire of uniform area of cross-section 'A' length 'L' and resistance 'R' is cut into two equal parts. The resistivity of each part.

- \* Becomes zero      \* Is halved  
\* Is doubled      \* Remains same ✓

xiv) A child is swinging on a swing in sitting position. If he stands up, then the time period of the swing will:

- \* Increase      \* Decrease ✓  
\* Remains the same      \* First increase and then decrease

xv) The charging of a capacitor through a resistance follows:

- \* Linear law      \* Exponential law ✓  
\* Inverse square law      \* Power law

xvi) The physical quantity which remains constant during simple harmonic motion is:

- \* Velocity      \* Acceleration  
\* Energy ✓      \* Momentum

xvii) If  $V_a$ ,  $V_h$  and  $V_m$  are the speed of sound in air, hydrogen and metal at same temperature, then:

- \*  $V_a > V_h > V_m$       \*  $V_m > V_h > V_a$  ✓  
\*  $V_h > V_m > V_a$       \*  $V_m > V_a > V_h$