

Name of the Student: _____

Question No. 1. Encircle the correct option.

(20)

- (1) The branch of physics which deals with atomic nuclei is called
 a. solid state physics b. nuclear physics c. thermodynamics d. particles physics
- (2) In scientific notation, the number 0.0001 may be written as
 a. 10^{-3} b. 10^{-4} c. 1.0×10^{-4} d. 10×10^{-3}
- (3) Femto means
 a. 10^{-5} b. 10^{-12} c. 10^{-15} d. 10^{-18}
- (4) S.I units of intensity of light is
 a. ampere b. candela c. meter d. mole
- (5) The number of significant figures of 8.70×10^3 are;
 a. Three b. Four c. Five d. Seven
- (6) The dimension of work is
 a. $[ML^2T^{-2}]$ b. $[MLT^{-2}]$ c. $[ML^2T^{-3}]$ d. $[ML^2T^{-1}]$
- (7) If $X_1 = (10.5 \pm 0.1)$ cm and $X_2 = (26.8 \pm 0.1)$ cm, then $X_2 - X_1 =$
 (a) $(16.3 + 0.1)$ cm (b) (16.3 ± 0.2) cm (c) (16.1 ± 0.0) cm (d) (16.3 ± 0.0) cm
- (8) Significant figure in 0.0000846 are
 (a) six (b) seven (c) eight (d) three
- (9) The SI units of pressure in-terms of base units are
 a. $kg\ m^{-1}\ s^{-2}$ b. $kg\ m^{-1}\ s^{-3}$ c. $kg\ m\ s^{-2}$ d. $kg\ s^{-2}$
- (10) Which is the derived unit of the following units?
 a. meter b. mole c. candela d. newton
- (11) If $\mathbf{A} = 2\mathbf{i} - \mathbf{j} - 2\mathbf{k}$, magnitude of A is equal to
 a. -1 b. 3 c. -3 d. 2
- (12) Which is the vector quantity
 a. power b. inertia c. entropy d. tension
- (13) Which pair of forces give zero resultant?
 a. 2N & 2N b. 1N & 4N c. 2N & 5N d. 1N & 2N
- (14) Scalar product of two vector quantities is maximum when they are
 a. perpendicular b. parallel c. anti-parallel d. null
- (15) A force of 10 N is acting along x-axis, its component along y-axis
 (a) 10 N (b) 5 N (c) 8.66 N (d) 0
- (16) The magnitude of cross product and dot product of two vectors are equal, then vectors are
 a. parallel b. perpendicular c. antiparallel d. at 45°
- (17) The dot product of vector A with itself is equal to
 a. zero b. A c. A^2 d. 2 A
- (18) The body will be in translational equilibrium when
 a. $\Sigma \mathbf{p} = 0$ b. $\Sigma \mathbf{F} = 0$ c. $\Sigma \boldsymbol{\tau} = 0$ d. $\Sigma \mathbf{F}_x = 0$
- (19) Magnitude of cross product of two parallel vectors **a** and **b** is equal to
 a. $ab \cos^0$ b. 0 c. 2 ab d. $ab/2$
- (20) Two forces of magnitude F act perpendicular to each other. The angle made by the resultant force with the horizontal will be
 a. 90° b. 60° c. 45° d. 30°

Q. No. 2 write short answers of any six of the following questions.

2 x6=12

- I. Can you add zero to null vector? Explain
- II. Under what circumstances would a vector have components that are equal in magnitude?
- III. Two vectors have equal magnitudes. Can their sum be zero? Explain.
- IV. Can a body rotate about its centre of gravity under the action of its weight?
- V. Give the draw backs to use the period of a pendulum as a time standard.
- VI. Does dimensional analysis give any information on constant of proportionality? Explain.
- VII. Define physics and nuclear physics.
- VIII. Show that the equation $S = v_i t + \frac{1}{2} a t^2$ is dimensionally correct.

Q.No. 3 a. Define rectangular components. Explain the method of addition of two vectors by their rectangular components. Also find the magnitude of their resultant vector and its direction. (5)

b. The magnitude of dot and cross product of two vectors are 6 and $6\sqrt{3}$ respectively. Find the angle between the two vectors. (3)

OR

Q.No. 4 a. Define dot product of two vectors with examples. Also give its characteristics. (5)

b. Find work done when the point of application of the force $3\mathbf{i} + 2\mathbf{j}$ moves in a straight line from the point (2, -1) to the point (6, 4). (3)