Assignment 1 Chapter 1&2 Subject: Physics Class: First year Total Marks: 75

Name _____

Q. No. 1 Note: Select the Correct Option.

1. Position vector of a point P(a, b, c) in xz plane is given by
   (a) $\mathbf{r} = a\mathbf{i} + b\mathbf{j}$ (b) $\mathbf{r} = a\,\mathbf{i} + c\,\mathbf{k}$ (c) $\mathbf{r} = b\,\mathbf{j} + c\mathbf{k}$ (d) $\mathbf{r} = a\mathbf{i} + b\mathbf{y} + c\mathbf{k}$
2. Which of the following is a vector quantity?
   (a) torque (b) speed (c) density (d) work
3. Self product of vector **A** is equal to
   (a) A^2 (b) zero (c) one (d) **i.j**
4. If **A** x **B** = **0**, then it can be concluded that the two vectors are
   (a) unit vectors (b) perpendicular to each other (c) parallel to each other (d) position vectors
5. The magnitude of $\hat{i}.(\hat{j}\,x\hat{k})$ *is*
   (a) 1 (b) -1 (c) zero (d) 2 $\hat{i}$
6. The angle between X-axis, Y-axis and Z-axis is
   (a) 45^0 (b) 60^0 (c) 75^0 (d) 90^0
7. The magnitude of rectangular components of a vector are equal if its angle with x-axis is
   (a) 45^o (b) 30^o (c) 60^o (d) 90^o
8. When a vector is multiplied by a negative number then its
   (a) direction changes (b) direction remains same (c) direction reverses (d) magnitude must change
9. If x-component of a vector is positive and y-component is negative, the vector lies in
   (a) 1^{st} quadrant (b) 2^{nd} quadrant (c) 3^{rd} quadrant (d) 4^{th} quadrant
10. If both x and y components of a vector are negative, the proper angle of the vector is calculated as
    (a) $\theta = 180 + \Theta$ (b) $\theta = 180 - \Theta$ (c) $\theta = \Theta$ (d) $\theta = 360 + \Theta$
11. The magnitude of cross product of two vectors is maximum, when angle b/w them is
    (a) 0^o (b) 45^o (c) 90^o (d) 180^o
12. If **A = 2 i + j + 2k,** then A is equal to
    (a) zero (b) 3 (c) 9 (d) 5
13. If magnitude of **a+b** = magnitude of **a-b**, then angle b/w **a** and **b**
    (a) 0^o (b) 45^o (c) 90^o (d) 180^o
14. If line of action of force passes through axis of rotation of origin then its torque is
    (a) zero (b) maximum (c) minimum (d) infinite
15. The magnitude of 2/3 **i** – 1/3 **j** + 2/3 **k** is
    (a) zero (b) 1 (c) 3 (d) 1/3
16. Which of the following is a vector quantity?
    (a) power (b) inertia (c) entropy (d) tension
17. Which pair of following forces can give magnitude of resultant force equal to zero?
    (a) 2N & 2N (b) 1N & 4N (c) 2N & 5N (d) 1N & 2N
18. The resultant of two forces 30 N and 40 N acting at an angle of 90^o with each other, is
    (a) 30 N (b) 40 N (c) 50 N (d) 70 N
19. The scalar product of two vectors is maximum, when they are
    (a) parallel (b) perpendicular (c) anti parallel (d) at an angle of 60^o
20. When two vectors are anti-parallel, the angle between them is
    (a) 0^o (b) 270^o (c) 90^o (d) 180^o
21. The magnitude of cross product and dot product of two vectors are equal, the angle b/w vectors is
    (a) zero (b) 45^o (c) 90^o (d) 180^o
22. The magnitude of a unit vector is
    (a) zero (b) 1 (c) 2 (d) 3
23. Which of the following is the example of a vector quantity?
    (a) torque (b) speed (c) density (d) work
24. The resultant of two forces of 5 N each, acting on an object of mass 5 kg in opposite direction is
    (a) zero (b) 5 N (c) 10 N (d) 15 N
25. The magnitude of $\hat{i}.(\hat{k}x\hat{j})$ *is*
    (a) 1 (b) -1 (c) zero (d) 2 $\hat{i}$

26. Head to tail rule is used for
(a) Addition of vectors (b) subtraction of vectors (c) multiplication of vectors (d) division of vectors
27. If x-component of a vector is negative and y-component is positive, the vector lies in
(a) 1^{st} quadrant (b) 2^{nd} quadrant (c) 3^{rd} quadrant (d) 4^{th} quadrant
28. If both x and y components of a vector are negative, the proper angle of the vector is calculated as
(a) $\theta = 180 + \varphi$ (b) $\theta = 180 - \varphi$ (c) $\theta = \varphi$ (d) $\theta = 360 - \varphi$
29. The cross product of two vectors will be maximum at an angle of
(a) 0^o (b) 60^o (c) 90^o (d) 180^o
30. The scalar product of two vectors **A** and **B** will equal to zero if the angle between them is
a. 0^0 b. 90^0 c. 120^0 d. 180^0
31. The magnitude of resultant is 5 units. The magnitude of one of its rectangular component is 4 units. The magnitude of other component is equal to
(a) 5 (b) 4 (c) 3 (d) 2
32. If $\mathbf{A} = 2\mathbf{i}+\mathbf{j}+2\mathbf{k}$, then magnitude of **A** is equal to
(a) zero (b) 3 (c) 5 (d) 9
33. Reverse process of vectors addition is called
(a) subtraction of vectors (b) resolution of vector (c) obtaining unit vector (d) product of vectors
34. Which of the following is a vector quantity?
(a) power (b) inertia (c) mass (d) acceleration
35. A force of 10 N is acting along x-axis, its component along y-axis is
(a) 10 N (b) 5 N (c) 8.66 N (d) zero
36. When two vectors are anti-parallel, the angle b/w them is
(a) zero (b) 45^o (c) 90^o (d) 180^o
37. Mathematically unit vector is given by
(a) $\hat{\mathbf{A}} = \mathbf{A}/A$ (b) $\hat{\mathbf{A}} = \mathbf{A}+\mathbf{A}$ (c) $\hat{\mathbf{A}} = A/\mathbf{A}$ (d) $\hat{\mathbf{A}} = \mathbf{A} \cdot \mathbf{A}$ (1)
38. The S.I. unit for intensity of light is;
a. radian b. mole c. candela d. ampere
39. The number of base units are;
a. Seven b. Two c. Three d. Four
40. Two forces of magnitude F act perpendicular to each other. The angle made by the resultant force with the horizontal will be
a. 90^o b. 60^o c. 45^o d. 30^o
41. S.I unit of solid angle is
a. radian b. steradian c. candela d. mole
42. The first digit dropped is less than 5, the last digit retained is;
a. Decreased by one b. Increased by one c. unchanged d. All of these
43. The scalar product of two vectors **A** and **B** will be maximum if the angle between them is
a. 0^0 b. 90^0 c. 120^0 d. 180^0
44. The magnitude of resultant is 5 units. The magnitude of one of its rectangular component is 3 units. The magnitude of other component is equal to
(a) 5 (b) 4 (c) 3 (d) 2
45. The dimension of force
(a) $[ML^2T^{-2}]$ (b) $[ML^{-2}T^{-2}]$ (c) $[MLT^{-1}]$ (d) $[MLT^{-2}]$
46. The SI unit 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. $kg\ m^{-2}$
47. The significant figures in 0.0482 are
a. 2 b. 3 c. 4 d. 5
48. The dimension of modulus of elasticity (E) is
a. $[ML^{-1}T^{-2}]$ b. $[MLT^{-2}]$ c. $[ML^{-1}T]$ d. $[ML^{-2}T^{-2}]$
49. Which is the least sub-multiple
a. pico b. femto c. atto d. nano
50. The branch of physics which deals with study of structure and properties of solid is called
a. Solid State Physics b. Mechanics c. Particle Physics d. Nuclear Physics
51. Resultant of two forces 4 N and 3N inclined at an angle of 90^o
a. 1 N b. 2 N c. 4 N d. 5 N
52. Two forces of 60 N and 80 N acting on a body opposite of each other are added. Their resultant is
a. 20 N b. 140 N c. 4800 N d. can not be added
53. The cross product **jxi** is equal to

a. **k** b. **-k** c. 1 d. zero

54. Magnitude of cross product of two parallel vectors **a** and **b** is equal to
a. ab $\cos 0^0$ b. 0 c. 2 ab d. ab/2

55. The base units for power are;
a. kg m^2 s^{-2} b. kg m s^{-2} c. kg m^{-1} s^{-3} d. kg m^2 s^{-3}

56. The number of supplementary units are;
a. Seven b. Two c. Three d. Four

57. The S.I. unit for intensity of light is;
a. radian b. mole c. candela d. ampere

58. Physics is a quantitative science based on primarily on ;
a. fundamental quantities b. definitions c. description d. experiments and measurements

59. The error produced due to faulty apparatus is called;
a. Random error b. Systematic error c. Personal error d. None of these

60. The number of significant figures of 8.07×10^3 are;
a. Three b. Four c. Five d. Seven

61. In rotational motion, the analogy of force is
(a) Rotational inertia (b) moment of inertia (c) Torque (d) Acceleration

62. The SI unit of pressure is
a. watt b. joule c. pascal d. newton

63. The significant figures in 0.04820 are
a. 2 b. 3 c. 4 d. 5

64. Solid angle is represented by
a. rad b. sr c. cd d. A

65. The scientific notation of a number 0.0056 is
a. 5.6×10^{-2} b. 5.6×10^{-3} c. 5.6 d. 56

66. Physical quantities are divided into
(a) two categories (b) three categories (c) four categories (d) five categories

67. The computer chips are made from
a. Germanium b. Silicon c. Sand d. Aluminum

68. A precise measurement is one which has
a. Zero precision b. absolute precision c. Maximum precision d. less precision

69. The first digit dropped is more than 5, the last digit retained is;
a. Decreased by one b. Increased by one c. unchanged d. All of these

70. Magnitude of cross product of two perpendicular vectors **a** and **b** is equal to
a. ab $\cos\theta$ b. 0 c. ab $\sin\theta$ d. ab

71. The dimension of work is
a. $[MLT^{-2}]$ b. $[MLT^2]$ c. $[ML^2T^{-3}]$ d. None of these

72. If $x_1 = (10.5 \pm 0.1)$ cm and $x_2 = (26.8 \pm 0.1)$ cm then $x_2 - x_1$ is given by
a. (16.3+0.1) cm b. (16.3 ± 0.2) cm c. (16.1 ± 0) cm d. (16.3 ± 0) cm

73. The sum of three numbers, 2.7543, 4.10 and 1.273 up to correct decimal place is
a. 8.12 b. 8.13 c. 8.1273 d. 8.127

74. Femto means
a. 10^{-5} b. 10^{-10} c. 10^{-15} d. 10^{-18}

75. The solid angle subtended at the centre of a sphere is
a. 2π b. 4π c. 6π d. 3π

Assignment 2 Chapter 1&2 Subject: Physics Class: First year Total Marks: 14

Note: Write short answers.

Q.1 Define physics and nuclear physics.
Q.2 Show that the equation $S = v_i t + \frac{1}{2} at^2$ is dimensionally correct.
Q.3 Differentiate between base and derived quantities.
Q.4 What is negative and positive torque?
Q.5 How a vector is detrained when its rectangular components are given?
Q.6 What is negative vector? How **B** is subtracted from **A**?
Q.7 Show that the square of a vector is scalar quantity.