

Arts, Commerce and Science College, Bodwad

Class: F. Y. B.Sc.

PHY 101 Basic Mechanics

Unit 1 Vectors

Multiple Choice Question (1 marks)

- If \vec{A} and \vec{B} represents two different physical quantities, which of the following mathematical operations is /are valid?
 - $\vec{A} \cdot \vec{B}$
 - $\vec{A} + \vec{B}$
 - $\vec{A} \times \vec{B}$
 - Both (a) and (c)
- If $\vec{C} = \vec{B} \times \vec{A}$, then $(\vec{A} \times \vec{B}) \times \vec{C}$ is
 - a zero vector
 - $-\vec{C}$
 - zero
 - none of these
- A unit vector in the direction of the negative of the vector $(-\hat{i} - \hat{j} - \hat{k})$ is
 - $(\hat{i} + \hat{j} - \hat{k})$
 - $\frac{1}{\sqrt{3}}(\hat{i} + \hat{j} - \hat{k})$
 - $-\frac{1}{\sqrt{3}}(\hat{i} + \hat{j} - \hat{k})$
 - $\sqrt{3}(\hat{i} + \hat{j} - \hat{k})$
- A vector \vec{B} lies in the XY- plane and makes an angle (θ) with the positive Y – direction; then the (x) component of \vec{B} is
 - $B \cdot \tan \theta$
 - $B \cdot \cos \theta$
 - $B \cdot \sin \theta$
 - $B \cdot \sec \theta$
- If \vec{D} is the resultant of \vec{A} , \vec{B} and \vec{C} , then the magnitude of vector $\vec{A} + \vec{B} + \vec{C} - \vec{D}$ is
 - $\sqrt{A^2 + B^2 + C^2 + D^2}$
 - Zero

c) $\vec{A} + \vec{B} + \vec{C} - \vec{D}$

d) $\vec{A} + \vec{B} + \vec{C} + \vec{D}$

6. A vector \vec{A} has x and y components of 4 units and 3 units respectively, while \vec{B} is of length 8 units and pointed towards the negative (x) – direction ; then, the vector $(\vec{B} - \vec{A})$ is

a) $-3(4\hat{i} + \hat{j})$

b) $-4\hat{i} - \hat{j}$

c) $-4\hat{i} + 3\hat{j}$

d) $3(4\hat{i} + \hat{j})$

7. If $\vec{A} = A_x \hat{i}$, $\vec{B} = B_y \hat{j}$, $\vec{C} = \vec{A} + \vec{B}$ and $\vec{D} = \vec{A} \times \vec{B}$ then $\vec{C} \cdot \vec{D} = \dots\dots\dots$

a) $A_x^2 + B_y + A_x \cdot B_y^2$

b) Zero

c) $A_x^2 B_y - A_x \cdot B_y^2$

d) $A_x \cdot B_y^2 - A_x^2 \cdot B_y$

8. If, $\vec{F} = 12\hat{j}$ and $\vec{V} = 4\hat{i}$, then the component of (\vec{F}) along the (\vec{V}) is

a) 4

b) 8

c) 0

d) 16

9. If the velocity and time parameters are denoted by (\vec{V}) and (t) respectively, then the product $(t \cdot \vec{V})$ is

a) a velocity of magnitude (t) times $|\vec{V}|$.

b) a vector in a direction different from that of (\vec{V}) .

c) a scalar of magnitude (t) times $|\vec{V}|$.

d) the displacement in the direction of (\vec{V}) .

10. If $\vec{A} \cdot \vec{B} = |\vec{A} \times \vec{B}|$ then the angle between \vec{A} and \vec{B} is

a) 0

b) 45°

17. A force $(3\hat{i} + 4\hat{j})$ N acts on a body, which displaces the body by $(3\hat{i} + 4\hat{j})$ M then the work done by the force is

- a) 10 J.
- b) 25 J
- c) 12 J
- d) 16 J

18. Two vectors (\vec{A}) and (\vec{B}) are perpendicular to each other if

- a) $\vec{A} \times \vec{B} = 0$
- b) $\vec{A} \cdot \vec{B} = 1$
- c) $\vec{A} \times \vec{B} = 1$
- d) $\vec{A} \cdot \vec{B} = 0$

19. Three vectors (\vec{A}) , (\vec{B}) and (\vec{C}) will give a triangle, if

- a) $\vec{A} + \vec{B} = \vec{C}$
- b) $\vec{A} + \vec{B} + \vec{C} = 0$
- c) $\vec{A} + \vec{B} < \vec{C}$
- d) $\vec{A} + \vec{B} > \vec{C}$

20. A quantity which is completely describe by magnitude and direction is known as

- a) Complex conjugate
- b) Scalar quantities
- c) Vector quantity
- d) non of these

21. If \vec{A} and \vec{B} are two vectors then scalar product is given as

- a) $AB \cos \theta$
- b) $AB \sin \theta$
- c) $AB \tan \theta$
- d) $AB \cot \theta$

22. If \vec{A} and \vec{B} are two vectors then vector product has magnitude

- a) $AB \cos \theta$
- b) $AB \sin \theta$
- c) $AB \tan \theta$
- d) $AB \cot \theta$

23. Self cross product is equal to

- a) 1
- b) 2
- c) 3
- d) 0

24. Area of parallelogram =

a) magnitude of scalar product \vec{A} and \vec{B}

b) magnitude of vector product \vec{A} and \vec{B}

c) magnitude of \vec{A}

d) magnitude of \vec{B}

25. Scalar triple product represents

a) Volume of spheres

b) Volume of cube

c) Volume of parallelepiped

d) none of these

26. Area of triangle =

a) $\frac{1}{2} |\vec{A} \times \vec{B}|$

b) $\frac{1}{2} |\vec{A} \cdot \vec{B}|$

c) $\frac{\vec{A} \cdot \vec{B}}{|\vec{A} \cdot \vec{B}|}$

d) $\frac{\vec{A} \times \vec{B}}{|\vec{A} \times \vec{B}|}$

27 If scalar product of two vectors is zero then two vectors must be to each other.

a) parallel

b) antiparallel

c) perpendicular

d) none of these

28 $\hat{i} \times \hat{i} = \hat{j} \times \hat{j} = \hat{k} \times \hat{k} = \dots\dots\dots$

a) 0

b) 1

c) -1

d) none of these

29 If three vectors are co-planer then their scalar triple product is

a) zero

b) one

c) two

d) three

30. Two vectors \vec{A} and \vec{B} are equal if they have

a) the same magnitude and direction

b) the same magnitude but having different direction

c) the different magnitude and having same direction

d) None of these

31) $\hat{i} \cdot \hat{i} = \hat{j} \cdot \hat{j} = \hat{k} \cdot \hat{k} = ?$

- a) 0 b) 1 c) -1 d) none of these

32) $\hat{A} = 2\hat{i} - \hat{j} + \hat{k}$ and $\hat{B} = 2\hat{i} + 3\hat{j} + \hat{k}$ then $\overline{A} \cdot \overline{B} = ?$

- a) 2 b) -2 c) 6 d) 10

33 Direction of the vector product of two vectors is along

- a) Parallel to the plane formed by the vectors
b) Perpendicular to the of the given vectors
c) Same direction as that of the given vectors
d) None of these

34 $\overline{A} \times \overline{B} = ?$

- a) $\overline{B} \times \overline{A}$ b) $-\overline{B} \times \overline{A}$ c) $\overline{A} + \overline{B}$ d) None of these

35 If three vectors are coplanar, their scalar triple product is

- a) Zero b) Unit c) Infinity d) None of these

36 The scalar triple product of three vectors is also known as the

- a) Dot product b) Cross product c) Box product d) None of these

37 represents the volume of parallelepiped whose edges are given vectors $\overline{A}, \overline{B}$ and \overline{C}

- a) $\overline{A} \times (\overline{B} \times \overline{C})$ b) $\overline{A} \times (\overline{B} \times \overline{C})$ c) $\overline{A} + (\overline{B} \times \overline{C})$ d) $\overline{A} + (\overline{B} \times \overline{C})$

38 The vector triple product of three vectors is a

- a) Scalar b) Vector c) Zero d) None of these

39 can be expressed as scalar product of two different vector quantities

- a) Work done
- b) Force acting on a moving charged particle in a magnetic field
- c) moment of force
- d) None of these

Answers:

- | | | | | |
|--------|--------|--------|--------|--------|
| 1. d) | 2. a) | 3. b) | 4. c) | 5. b) |
| 6. a) | 7. b) | 8. c) | 9. a) | 10. b) |
| 11. c) | 12. a) | 13. b) | 14. d) | 15. a) |
| 16. c) | 17. b) | 18. d) | 19. a) | 20. c) |
| 21. a) | 22. b) | 23. d) | 24. b) | 25. c) |
| 26. a) | 27. c) | 28. a) | 29. a) | 30. a) |
| 31. b) | 32. a) | 33. b) | 34. b) | 35. a) |
| 36. c) | 37. b) | 38. b) | 39. a) | |

Unit 1 Vectors

1) A quantity which is completely describe by magnitude and direction is known as

- a) Complex conjugate b) Scalar quantities c) Vector quantity d) none of these

2) If \vec{A} and \vec{B} are two vectors then scalar product is given as

- a) $AB \cos \theta$ b) $AB \sin \theta$ c) $AB \tan \theta$ d) $AB \cot \theta$

3) If \vec{A} and \vec{B} are two vectors then vector product has magnitude

- a) $AB \cos \theta$ b) $AB \sin \theta$ c) $AB \tan \theta$ d) $AB \cot \theta$

4) Self cross product is equal to

- a) 1 b) 2 c) 3 d) 0

5) Area of parallelogram =

- a) magnitude of scalar product \vec{A} and \vec{B} b) magnitude of vector product \vec{A} and \vec{B}
 c) magnitude of \vec{A} d) magnitude of \vec{B}

6) Scalar triple product represents

- a) Volume of spheres b) Volume of cube
 c) Volume of parallelepiped d) none of these

7) Area of triangle =

- a) $\frac{1}{2} |\vec{A} \times \vec{B}|$ b) $\frac{1}{2} |\vec{A} \cdot \vec{B}|$
 c) $\frac{\vec{A} \cdot \vec{B}}{|\vec{A} \cdot \vec{B}|}$ d) $\frac{\vec{A} \times \vec{B}}{|\vec{A} \times \vec{B}|}$

8) If scalar product of two vectors is zero then two vectors must be to each other.

- a) parallel b) antiparallel c) perpendicular d) none of these

9) $\hat{i} \times \hat{i} = \hat{j} \times \hat{j} = \hat{k} \times \hat{k} = \dots\dots\dots$

- a) 0 b) 1 c) -1 d) none of these

10) If three vectors are co-planer then their scalar triple product is

- a) zero b) one c) two d) three

11) Two vectors \vec{A} and \vec{B} are equal if they have

- a) the same magnitude and direction
 b) the same magnitude but having different direction

c) the different magnitude and having same direction

d) None of these

12) $\hat{i} \cdot \hat{i} = \hat{j} \cdot \hat{j} = \hat{k} \cdot \hat{k} = ?$

a) 0

b) 1

c) -1

d) none of these

13) $\hat{A} = 2\hat{i} - \hat{j} + \hat{k}$ and $\hat{B} = 2\hat{i} + 3\hat{j} + \hat{k}$ then $\overline{\hat{A}} \cdot \overline{\hat{B}} = ?$

a) 2

b) -2

c) 6

d) 10

14) **Direction of the vector product of two vectors is along**

a) Parallel to the plane formed by the vectors

b) Perpendicular to the of the given vectors

c) Same direction as that of the given vectors

d) None of these

15) $\overline{\hat{A}} \times \overline{\hat{B}} = ?$

a) $\overline{\hat{B}} \times \overline{\hat{A}}$

b) $-\overline{\hat{B}} \times \overline{\hat{A}}$

c) $\overline{\hat{A}} + \overline{\hat{B}}$

d) None of these

16) **If three vectors are coplanar, their scalar triple product is**

a) Zero

b) Unit

c) Infinity

d) None of these

17) **The scalar triple product of three vectors is also known as the**

a) Dot product

b) Cross product

c) Box product

d) None of these

18) represents the volume of parallelepiped whose edges are given vectors

$\overline{\hat{A}}, \overline{\hat{B}}$ and $\overline{\hat{C}}$

a) $\vec{A} \times (\vec{B} \times \vec{C})$ b) $\vec{A} \times (\vec{B} \times \vec{C})$ c) $\vec{A} + (\vec{B} \times \vec{C})$ d) $\vec{A} + (\vec{B} \times \vec{C})$

19) The vector triple product of three vectors is a

- a) Scalar b) Vector c) Zero d) None of these

20) can be expressed as scalar product of two different vector quantities

- a) Work done b) Force acting on a moving charged particle in a magnetic field
c) moment of force d) None of these

Answers:

- | | | | |
|-------|-------|-------|-------|
| 1) c | 2) a | 3) b | 4) d |
| 5) b | 6) c | 7) a | 8) c |
| 9) a | 10) a | 11) a | 12) b |
| 13) a | 14) b | 15) b | 16) a |
| 17) c | 18) b | 19) b | 20) a |

Unit2 Differential equation

Multiple Choice Questions (1 mark each)

- In Physics, the rate of change of dependent variables, w.r.t. the independent variable is called as _____.
 - Function
 - Derivative
 - Integration
 - None of these
- A physical quantity (f) depends upon other physical quantities (x & y) can be symbolised as _____.
 - $F = F(x, y)$
 - $F = \sum (x + y)$
 - $F = x + y$
 - None of these
- In a differential term $\frac{dy}{dx}$, y & x are _____ variables respectively.
 - dependent & independent
 - independent & dependent
 - both are dependent
 - both are independent
- A mathematical equation, which involves the function & its derivatives, is called as a _____ equation.
 - differential
 - kinematical
 - mass-energy
 - None of these
- A differential equation consists of at least one _____.
 - Integration
 - derivative
 - both of these
 - None of these
- Newton's second law of Motion can be written as _____.
 - $\vec{F} = m \vec{P}$
 - $\vec{F} = m \vec{P}$
 - $\vec{F} = \vec{P}$
 - $\vec{F} = 2\vec{P}$
- $\vec{F} = \vec{P}$ is a _____ equation.
 - kinematical
 - differential
 - both of these
 - none of these
- In a different equation $v = \frac{dx}{dt}$, t _____ variable.
 - dependent
 - independent
 - both of these
 - none of these
- A differential equation, which consists of only _____ independent variable, is called as

an ordinary differential equation.

- a) 0
- b) 1
- c) 2
- d) 3

10. A differential equation, which consists of more than _____ independent variable, is called as an partial differential equation.

- a) 0
- b) 1
- c) 2
- d) 3

11. In a differential equation, $\frac{d^2 f}{\partial x^2} + \frac{d^2 f}{\partial y^2} = 0$, there are _____ independent variable.

- a) 0
- b) 1
- c) 2
- d) 3

12. In a differential equation, $\frac{d^2 f}{\partial x^2} + \frac{d^2 f}{\partial y} + \frac{d^2 f}{\partial z^2} = 0$, there are _____ independent variable.

- a) 1
- b) 2
- c) 3
- d) 4

13. The Laplace's equation is _____.

- a) $\nabla \psi = 0$
- b) $\nabla^2 \psi = 0$
- c) $\nabla \psi \neq 0$
- d) $\nabla^2 \psi \neq 0$

14. Laplace's equation in 1-D is _____ differential equations.

- a) ordinary
- b) partial
- c) total
- d) None of these

15. The Laplace's equation in 2-D and 3-D are _____ differential equations.

- a) ordinary
- b) partial
- c) total
- d) None of these

16. The power of the highest derivative, after the differential equation has been reationalised, is called as the _____ of differential equation.

- a) degree
- b) order
- c) power
- d) None of these

17. The differentiable equation $L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{c} = 0$ is _____.

- a) first order, first degree
- b) first order, second degree
- c) second order, first degree
- d) second order, second degree

18. The order of the _____ derivative in a differential equation is called as the order of a differential equation.

a) linear b) differential c) homogeneous d) non linear

3) An ordinary differential equation is containing ----- independent variable.

a) more than one b) two c) only one d) none of these

4) A differential equation containing more than one independent variable is called ----- differential equation.

a) ordinary b) linear c) homogeneous d) partial

5) An order of differential equation is the order of ----- derivative in the equation.

a) highest b) lowest c) same d) none of these

6) $x^2 \frac{d^2y}{dx^2} + \frac{dy}{dx} - 2x^3 y = 0$, This is a ----- differential equation,

a) non homogeneous b) partial c) homogeneous d) none of these

7) $\frac{d^3y}{dx^3} + 6 \frac{dy}{dx} + 3y = 0$ is ----- differential equation.

a) first degree and second order b) third degree and first order

c) second degree and first order d) first degree and third order

Answers:

1) a 2) b 3) c 4) d 5) a 6) c 7) d

Unit 3 Laws of Motions

1. A stationary object has no forces acting on it. True or **false**.
2. Inertia is the property of mass in which An object at rest wants to stay at rest and an object that is moving wants to ---
 - a. Stay at rest.
 - b. Stay moving in a straight line unless acted upon by another force.
 - c. Stay moving in a circular motion unless acted upon by another force.
 - d. Stay moving in a straight line but only if it has been acted upon by another force.
3. Frame of references are classified in to two types are
 - a. True and fictional.
 - b. Fast and slow.
 - c. Inertial and non inertial.
 - d. Real and imaginary.
4. Force that produces an acceleration of 1 m/s^2 in a body of mass 1 K , is called.
 - a. One Newton
 - b. Zero Newton.
 - c. Slow Newton.
 - D. Two Newton.
5. Mass of object is quantitative measure of its inertia stated law is Newton's
 - a. Newton's first law.
 - b. Newton's second law.
 - c. Newton's Third law
 - d. none
6. Mass of a body into acceleration is equal to.
 - a. Inertia
 - b. displacement
 - c. force
 - d. momentum.
7. If two balls of same masses are dropped on sand, the depths of penetration is same if
 - a. Heavier ball is dropped faster than lighter ball
 - b. Lighter ball is dropped faster than heavier ball
 - c. The product 'mv' is same for both bodies
 - d. None of these
8. The rate of change of momentum of an object is proportional to
 - a. Mass of the body
 - b. Velocity of the body
 - c. Net force applied on the body
 - d. None of these
9. A football and a stone has same mass
 - a. Both have same inertia.
 - b. Both have same momentum.
 - c. Both have different inertia.
 - d. Both have different momentum.
10. Action and reaction forces
 - a. Act on the same body
 - b. Act on different bodies
 - c. Act in same direction
 - d. Both I and III.
11. An observer on the ground sees a hot air balloon rise up in the air with a speed of 10 m/s . From which of these points of references does the balloon have the same speed?
 - a. A fellow observer on the ground
 - b. A bird flying in the sky.
 - c. A person running towards the direction of the balloon.

- d. A person in the balloon.
12. Ram is in a car of a roller coaster which is moving at a speed of 40 m/s. At which of these points of reference, will Ram seem to have zero speed?
- An observer on the ground
 - A person cycling near the roller coaster.
 - A bird flying over the roller coaster.
 - A person sitting next to Ram.
13. Two cars, P and Q are traveling towards each other with a speed of 50 mph as observed by a pedestrian on the sidewalk. From which of these points of references will each of the cars have a speed of greater than 50 mph?
- Only a passenger from Q.
 - Only a passenger from P.
 - From the observer.
 - From any passenger in both car P and Q.
14. The net force on an object is denoted by ΣF and its acceleration is denoted by \bar{a} . Which of the following expressions is valid in an inertial frame?
- $\Sigma F = 0, \bar{a} = \infty.$
 - $\Sigma F = 0, \bar{a} = 0.$
 - $\Sigma F \neq 0, \bar{a} = 0.$
 - $\Sigma F = 0, \bar{a} \neq 0.$
15. Which of these statements is correct if Frame 2 is stationary and Frame 1 moves with a constant acceleration with respect to frame 2?
- Frame 1 is noninertial and frame 2 is inertial.
 - Frame 1 is inertial and frame 2 is noninertial
 - Both frames are noninertial.
 - Both frames are inertial
16. If Frame 2 is stationary and Frame 1 moves with a constant velocity with respect to frame 2 then which of the following statement is correct?
- Frame 2 is inertial and frame 1 is noninertial.
 - Frame 1 is inertial and frame 2 is noninertial
 - Both frames are noninertial.
 - Both frames are inertial.
17. The net force on an object is denoted by ΣF and its acceleration is denoted by \bar{a} . Which of the following can be an inertial frame?
- Frame 1: $\Sigma F \neq 0, \bar{a} = 0.$
 - Frame 2: $\Sigma F = 0, \bar{a} = 0.$
 - Frame 3: $\Sigma F = 0, \bar{a} \neq 0.$
 - None of above

- c) can not be inertial frame because earth is rotating about its axis.
d) none of these
- 4) Newton's second law gives the measure of
- a) acceleration b) force c) momentum d) angular momentum
- 5) If two balls at same temperature collides then is conserved.
- a) temperature b) velocity c) kinetic energy d) momentum
- 6) A body is acted upon by a constant force then it will have a uniform
- a) acceleration b) momentum c) velocity d) speed
- 7) A person standing on the floor of an elevator drops a coin. The coin reaches the floor of the elevator in a time t_1 if the elevator is stationary and in time t_2 if it is moving uniformly. Then.....
- a) $t_1 < t_2$ b) $t_1 = t_2$
c) $t_1 > t_2$ d) $t_1 < t_2$ or $t_1 > t_2$ depending on whether the lift is going up or down
- 8) A reference frame attached to the earth
- a) is an inertial frame by definition
b) is an inertial frame because Newton's laws are applicable in this frame.
c) cannot be an inertial frame because the earth is rotating about its axis
d) none of the above
- 9) A particle stays at rest as seen in a frame. We can conclude that
- a) the frame is inertial
b) resultant force on the particle is zero
c) the frame may be inertial but the resultant force on the particle is zero
d) none of the above
- 10) A particle is found to be at rest when seen from a frame S_1 and moving with constant velocity when seen from another frame S_2 . State the possible option
- a) both the frames are inertial b) S_1 is inertial and S_2 is non inertial
c) S_1 is non inertial and S_2 is inertial d) none of the above
- 11) The force exerted by the floor of an elevator on the foot of a person standing there is more than the weight of the person if the elevator is
- a) going up and slowing down b) going up and speeding up
c) going down and speeding up d) none of the above

- 12) If the tension in the cable supporting an elevator is equal to the weight of the elevator, the elevator may be
- a) going up with increasing speed b) going down with increasing speed
 c) going up with uniform speed d) going down with decreasing speed
- 13) A particle is observed from two frames S_1 and S_2 . The frame S_2 moves with respect to S_1 with an acceleration 'a'. Let F_1 and F_2 be the pseudo forces on the particle when seen from S_1 and S_2 respectively. Then..... are not possible.
- a) $F_1 = 0, F_2 \neq 0$ b) $F_1 \neq 0, F_2 = 0$ c) $F_1 \neq 0, F_2 \neq 0$ d) $F_1 = 0, F_2 = 0$
- 14) A person says that he measured the acceleration of a particle to be non zero while no force was acting on the particle then
- a) he might have used non inertial frame. b) he is a liar
 c) his meter scale might have been longer than the standard d) his clock might have run slow

Answers:

- 1) a 2) b 3) c 4) b 5) d 6) a 7) b 8) b 9) c 10) a 11) b 12) c
 13) d 14) a

Unit 4 Momentum and energy

- The rate of change of displacement is
 - Force
 - Velocity
 - acceleration
 - Momentum
- The product of mass and velocity is called as
 - displacement
 - velocity
 - momentum
 - work
- The product of mass and acceleration is
 - momentum
 - force
 - work
 - energy
- SI unit of acceleration is
 - m/s
 - m/s²
 - M · s
 - m · s²
- SI unit of linear momentum is
 - kg · m · s
 - kg · m/s
 - kg / m · s
 - kg m²/s
- Dimensions of linear momentum are
 - [M¹L¹T¹]
 - [M¹L¹T⁻¹]
 - [M¹L⁻¹T⁻¹]
 - [M¹L¹T⁻²]
- SI unit of work is identical with SI unit of
 - Force
 - Energy
 - velocity
 - Displacement
- SI unit of work is
 - Joule
 - Erq
 - Newton
 - N. m/s
- SI unit of work is
 - N. m
 - N. m/s
 - N/m
 - N. m/s²
- CGS unit of work is
 - Joule
 - Erq

- c) Height below earth's surface d) none of above
30. K.E is directly proportional to
- a) Velocity b) (Velocity)²
 c) (Velocity)^{1/2} d) None of above.
31. A bullet of mass 5gm is fired from a gun of mass 2 kg with recoil velocity of 5 m/s, then the muzzle velocity of bullet is
- a) 500 m/s b) 1000 m/s
 c) 1500 m/s d) 2000 m/s
32. A man tries to push the wall and fails to displace it, the he performedwork.
- a) Positive b) Negative
 c) zero d) None of above
33. Mutual energy is nothing but
- a) K.E b) P.E
 c) K.E + P.E d) K.E – P.E

Answers

- | | | | | | | | | | |
|-----|----|-----|----|-----|----|-----|----|-----|----|
| 1. | b) | 2. | c) | 3. | b) | 4. | b) | 5. | b) |
| 6. | b) | 7. | b) | 8. | a) | 9. | a) | 10. | b) |
| 11. | a) | 12. | c) | 13. | a) | 14. | b) | 15. | c) |
| 16. | b) | 17. | b) | 18. | a) | 19. | a) | 20. | a) |
| 21. | a) | 22. | b) | 23. | c) | 24. | a) | 25. | a) |
| 26. | c) | 27. | a) | 28. | c) | 29. | b) | 30. | b) |
| 31. | d) | 32. | c) | 33. | b) | | | | |

Unit 4 Momentum and energy

- 1) The product of mass and velocity is called as
- a) Force b) Work c) Energy d) Momentum
- 2) SI units of linear momentum is
- a) Kg ms b) Kg m/s c) Kg m^{□1}/s d) Kg m²/s
- 3) Dimension of linear momentum
- a) [M¹L¹T¹] b) [MLT^{□1}] c) [M¹L^{□1}T^{□1}] d) [ML¹T^{□2}]
- 4) SI unit of Energy is

- a) Erg b) dyne c) Joule d) Newton
- 5) The capacity or ability to do work is called
- a) Frequency b) Energy c) Power d) Period
- 6) When K.E increases the work done is -----
- a) Zero b) Negative c) Positive d) none of them
- 7) When K.E. decreases the work done is -----
- a) Positive b) Zero c) Negative d) None
- 8) A bullet of mass 10 gm is fired from a gun of mass 1 kg with recoil velocity of 5 m/s then the muzzle velocity of bullet is
- a) 30 km /min b) 60 km/min c) 30m/s d) 500 m/s
- 9) A man pushes a wall and fails to displace it, he does.....
- a) negative work b) no work at all
- c) positive work but not maximum d) maximum positive work
- 10) A work performed on the object does not depend upon
- a) force applied b) angle at which force is inclined
- c) initial velocity of the object d) displacement

Answers

1) d, 2) b, 3) b, 4) c, 5) b, 6) c, 7) c, 8) d, 9) b, 10) c

Unit 5 Rotational Motion

Multiple Choice Questions:

- 1) Dimensions of angular displacement are -----
 - a) [MLT]
 - b) $[M^0L^0T^0]$
 - c) $[M^1LT^{-1}]$
 - d) $[M^2LT]$
- 2) Unit of angular displacement is-----
 - a) Degree
 - b) Degree/s
 - c) radian
 - d) Rad/s
- 3) Dimensions of angular velocity are-----
 - a) [MLT]
 - b) $[M^0L^0T^{-1}]$
 - c) $[M^1LT^{-1}]$
 - d) $[M^2LT]$
- 4) Unit of angular velocity is-----
 - a) Degree
 - b) Degree/s
 - c) radian
 - d) rad/s
- 5) Dimensions of Angular momentum are-----
 - a) $[ML^2T]$
 - b) $[M^0L^0T^{-1}]$
 - c) $[M^1L^2T^{-1}]$
 - d) $[M^2LT]$
- 6) S I Unit of angular momentum is-----
 - a) Kg/s
 - b) kgm/s
 - c) kgm^2s^{-1}
 - d) erg/s
- 7) CGS Unit of angular momentum is-----
 - a) Kg/s
 - b) kgm/s
 - c) Nm/s
 - d) gcm^2/s
- 8) Dimension of torque is-----

7) The moment of inertia of body does not depend on.....

a) mass of the body b) position of axis of rotation c) velocity of the body d) shape of the body

8) The moment of momentum is called as.....

a) couple b) torque c) impulse d) angular momentum

Answers:

1) C 2) c 3) a 4) b 5) d 6) a 7) c 8) d

.....

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