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# Practice **Set 4**

## **Classical**

## **MECHANICS**

### Topics :

Circular motion, angular velocity, angular acceleration, centripetal and centrifugal force, Work, energy, kinetic energy, potential energy, power.

DDCE final exam weightage of this topic : 3 Questions ( 6 Marks )

Total Practice sets  
of this topic :

$8 \text{ ( sets ) } \times 25 \text{ ( questions ) } = 200 \text{ Questions}$

Total Practice tests  
of this topic :

$2 \text{ ( exams ) } \times 30 \text{ ( questions ) } = 60 \text{ Questions}$

Offline / Online  
during lecture :

$4 \text{ ( lectures ) } \times 50 \text{ ( Questions ) } = 200 \text{ Question}$

Total 460 Questions to  
practice this topic



**91739 04421**



# UNITY TRAINING ACADEMY FOR DDCET

## Section 1 :

Circular motion, angular velocity, angular acceleration, centripetal and centrifugal force, Work, energy, kinetic energy, potential energy, power.

1. In uniform circular motion, which quantity remains constant?

- A) Velocity
- B) Acceleration
- C) Speed
- D) Angular acceleration

2. The SI unit of angular velocity is:

- A) rad/s
- B) m/s
- C) m/s<sup>2</sup>
- D) Hz

3. Centripetal force always acts:

- A) Outwards from the center
- B) Along the tangent
- C) Perpendicular to the radius
- D) Towards the center

4. Angular acceleration is defined as:

- A) Rate of change of linear velocity
- B) Rate of change of angular velocity
- C) Angular displacement
- D) Rotational inertia

5. A body moving in a circle with constant speed has:

- A) Zero velocity
- B) Zero acceleration
- C) Changing velocity
- D) Changing speed

6. Which of the following quantities is a vector?

- A) Angular displacement
- B) Angular velocity
- C) Angular speed
- D) Centripetal force

7. The direction of angular velocity is given by:

- A) Newton's law
- B) Right-hand thumb rule
- C) Left-hand rule
- D) Lenz's law

8. A satellite moves in circular orbit due to:

- A) Centrifugal force
- B) Gravity acting as centripetal force
- C) Inertia
- D) Thrust

9. Angular velocity ( $\omega$ ) is related to linear velocity ( $v$ ) as:

- A)  $\omega = v/r$
- B)  $v = r\omega^2$
- C)  $v = \omega r^2$
- D)  $\omega = r/v$

10. If the radius of the circular path is doubled while the linear speed remains constant, the centripetal force will:

- A) Double
- B) Halve
- C) Quadrupled
- D) Remain the same

11. What provides centripetal force in a car turning on a circular path?

- A) Engine
- B) Gravity
- C) Friction between tires and road
- D) Air resistance





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12. Which of these increases with increase in radius for same angular speed?

- A) Angular velocity
- B) Centripetal force
- C) Linear speed
- D) Angular acceleration

13. Work is said to be done when:

- A) Force is applied
- B) Displacement occurs
- C) Both force and displacement occur in same direction
- D) None of these

14. Which energy is possessed by a moving object?

- A) Potential energy
- B) Thermal energy
- C) Kinetic energy
- D) Electrical energy

15. Power is defined as:

- A) Work done  $\times$  time
- B) Work done / time
- C) Force  $\times$  displacement
- D) Energy  $\times$  time

16. Gravitational potential energy depends on:

- A) Height only
- B) Mass only
- C) Mass and height
- D) Speed

17. The energy stored in an object due to its position is:

- A) Kinetic
- B) Potential
- C) Thermal
- D) Chemical

18. If velocity is doubled, kinetic energy becomes:

- A) Same
- B) Double
- C) Four times
- D) Half

19. Which is not a form of mechanical energy?

- A) Potential
- B) Kinetic
- C) Thermal
- D) Both a and b

20. Work done against gravity is stored as:

- A) Kinetic energy
- B) Elastic energy
- C) Potential energy
- D) Thermal energy

21. What is the power of a machine that does 100 J of work in 2 seconds?

- A) 100 W
- B) 50 W
- C) 200 W
- D) 25 W





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22. Negative work is done when:

- A) Force and displacement are in same direction
- B) Force and displacement are in opposite directions
- C) No force is applied
- D) Displacement is zero

23. If no energy is lost, total mechanical energy is:

- A) Increased
- B) Decreased
- C) Constant
- D) Zero

24. Centripetal force is:

- A) A real force acting outward on a rotating object
- B) A fictitious force acting outward on a rotating object
- C) A real force acting inward towards the center of the circular path
- D) A fictitious force acting inward towards the center of the circular path

25. Centrifugal force is often described as:

- A) A real force
- B) A reaction force to centripetal force (Newton's Third Law pair)
- C) A fictitious force experienced in a rotating frame of reference
- D) The force responsible for circular motion

