TEST YOUR STRENGTH IN PHYSICS

Soumya S Nair, head, physics dept, MGR Central Public School, Thiruvanthapuram, has set a mock paper for you. Check your score.

PRACTICE PAPERS

GENERAL INSTRUCTIONS

1. All questions are compulsory. There are no negative marks.
2. This mock paper has Five sections, Section A, Section B, Section C, Section D, Section E.
3. There is no negative marking.
4. Try to use the following cues of physical concepts wherever necessary.

Section A

1. If the figure shows the initial state on the x-axis, in which the final state is towards the right and the displacement is positive, then which of the following is correct?

   A) Final state is towards the right and displacement is negative.
   B) Final state is towards the left and displacement is positive.
   C) Final state is towards the right and displacement is positive.
   D) Final state is towards the left and displacement is negative.

2. A graph showing the variation of speed with time for an object is given. The area under the curve represents the displacement of the object. Which of the following statements is correct?

   A) The area under the curve is always positive.
   B) The area under the curve is always negative.
   C) The area under the curve depends on the initial and final positions.
   D) The area under the curve is always zero.

3. A block of mass m is sliding down a frictionless inclined plane of angle θ with an initial velocity v. At what distance x from the bottom of the plane, will the block reach the ground?

   A) x = v² / g sin θ
   B) x = v² / 2g cos θ
   C) x = v² / g cos θ
   D) x = v² / 2g sin θ

4. A uniform sphere of mass M and radius R is rotating about an axis passing through its center. If the sphere is released from a height h above the ground and allowed to fall freely, what will be the angular speed ω of the sphere after it hits the ground?

   A) ω = √(2gh / MR²)
   B) ω = √(2gh / MR)
   C) ω = √(gh / MR²)
   D) ω = √(gh / MR)

5. A point charge q is placed at the center of a circular loop of radius r. Which of the following statements is true?

   A) The electric field is constant at all points on the loop.
   B) The electric field is zero at all points on the loop.
   C) The electric field is maximum at all points on the loop.
   D) The electric field is maximum at the center of the loop and zero at all other points on the loop.

6. A simple pendulum consists of a mass m hanging from a string of length l. The pendulum is released from a small angle θ from the vertical. What is the period T of the pendulum?

   A) T = 2π√(l/g)
   B) T = 2π√(l/g sin θ)
   C) T = 2π√(l/g cos θ)
   D) T = 2π√(l/g tan θ)

7. A converging lens of focal length f and a diverging lens of focal length f' are placed with their convex surfaces facing each other. Which of the following statements is correct?

   A) The lenses act as a single converging lens with focal length f - f'.
   B) The lenses act as a single diverging lens with focal length f + f'.
   C) The lenses act as a single converging lens with focal length f + f'.
   D) The lenses act as a single diverging lens with focal length f - f'.

Section B

1. A uniform sphere of mass M and radius R is rotating about an axis passing through its center. If the sphere is released from a height h above the ground and allowed to fall freely, what will be the angular speed ω of the sphere after it hits the ground?

   A) ω = √(2gh / MR²)
   B) ω = √(2gh / MR)
   C) ω = √(gh / MR²)
   D) ω = √(gh / MR)

2. A point charge q is placed at the center of a circular loop of radius r. Which of the following statements is true?

   A) The electric field is constant at all points on the loop.
   B) The electric field is zero at all points on the loop.
   C) The electric field is maximum at all points on the loop.
   D) The electric field is maximum at the center of the loop and zero at all other points on the loop.

3. A simple pendulum consists of a mass m hanging from a string of length l. The pendulum is released from a small angle θ from the vertical. What is the period T of the pendulum?

   A) T = 2π√(l/g)
   B) T = 2π√(l/g sin θ)
   C) T = 2π√(l/g cos θ)
   D) T = 2π√(l/g tan θ)

4. A converging lens of focal length f and a diverging lens of focal length f' are placed with their convex surfaces facing each other. Which of the following statements is correct?

   A) The lenses act as a single converging lens with focal length f - f'.
   B) The lenses act as a single diverging lens with focal length f + f'.
   C) The lenses act as a single converging lens with focal length f + f'.
   D) The lenses act as a single diverging lens with focal length f - f'.

Section C

1. A uniform sphere of mass M and radius R is rotating about an axis passing through its center. If the sphere is released from a height h above the ground and allowed to fall freely, what will be the angular speed ω of the sphere after it hits the ground?

   A) ω = √(2gh / MR²)
   B) ω = √(2gh / MR)
   C) ω = √(gh / MR²)
   D) ω = √(gh / MR)

2. A point charge q is placed at the center of a circular loop of radius r. Which of the following statements is true?

   A) The electric field is constant at all points on the loop.
   B) The electric field is zero at all points on the loop.
   C) The electric field is maximum at all points on the loop.
   D) The electric field is maximum at the center of the loop and zero at all other points on the loop.

3. A simple pendulum consists of a mass m hanging from a string of length l. The pendulum is released from a small angle θ from the vertical. What is the period T of the pendulum?

   A) T = 2π√(l/g)
   B) T = 2π√(l/g sin θ)
   C) T = 2π√(l/g cos θ)
   D) T = 2π√(l/g tan θ)

4. A converging lens of focal length f and a diverging lens of focal length f' are placed with their convex surfaces facing each other. Which of the following statements is correct?

   A) The lenses act as a single converging lens with focal length f - f'.
   B) The lenses act as a single diverging lens with focal length f + f'.
   C) The lenses act as a single converging lens with focal length f + f'.
   D) The lenses act as a single diverging lens with focal length f - f'.

Section D

1. A uniform sphere of mass M and radius R is rotating about an axis passing through its center. If the sphere is released from a height h above the ground and allowed to fall freely, what will be the angular speed ω of the sphere after it hits the ground?

   A) ω = √(2gh / MR²)
   B) ω = √(2gh / MR)
   C) ω = √(gh / MR²)
   D) ω = √(gh / MR)

2. A point charge q is placed at the center of a circular loop of radius r. Which of the following statements is true?

   A) The electric field is constant at all points on the loop.
   B) The electric field is zero at all points on the loop.
   C) The electric field is maximum at all points on the loop.
   D) The electric field is maximum at the center of the loop and zero at all other points on the loop.

3. A simple pendulum consists of a mass m hanging from a string of length l. The pendulum is released from a small angle θ from the vertical. What is the period T of the pendulum?

   A) T = 2π√(l/g)
   B) T = 2π√(l/g sin θ)
   C) T = 2π√(l/g cos θ)
   D) T = 2π√(l/g tan θ)

4. A converging lens of focal length f and a diverging lens of focal length f' are placed with their convex surfaces facing each other. Which of the following statements is correct?

   A) The lenses act as a single converging lens with focal length f - f'.
   B) The lenses act as a single diverging lens with focal length f + f'.
   C) The lenses act as a single converging lens with focal length f + f'.
   D) The lenses act as a single diverging lens with focal length f - f'.

Section E

1. A uniform sphere of mass M and radius R is rotating about an axis passing through its center. If the sphere is released from a height h above the ground and allowed to fall freely, what will be the angular speed ω of the sphere after it hits the ground?

   A) ω = √(2gh / MR²)
   B) ω = √(2gh / MR)
   C) ω = √(gh / MR²)
   D) ω = √(gh / MR)

2. A point charge q is placed at the center of a circular loop of radius r. Which of the following statements is true?

   A) The electric field is constant at all points on the loop.
   B) The electric field is zero at all points on the loop.
   C) The electric field is maximum at all points on the loop.
   D) The electric field is maximum at the center of the loop and zero at all other points on the loop.

3. A simple pendulum consists of a mass m hanging from a string of length l. The pendulum is released from a small angle θ from the vertical. What is the period T of the pendulum?

   A) T = 2π√(l/g)
   B) T = 2π√(l/g sin θ)
   C) T = 2π√(l/g cos θ)
   D) T = 2π√(l/g tan θ)

4. A converging lens of focal length f and a diverging lens of focal length f' are placed with their convex surfaces facing each other. Which of the following statements is correct?

   A) The lenses act as a single converging lens with focal length f - f'.
   B) The lenses act as a single diverging lens with focal length f + f'.
   C) The lenses act as a single converging lens with focal length f + f'.
   D) The lenses act as a single diverging lens with focal length f - f'.