MHT CET 2026 Physics Sample Paper 4

Question Booklet Version **4** (Write this number on your Answer Sheet)	MH-CET-2026 Roll No.	Question Booklet Sr. No.
	Answer Sheet No.	(Write this number on your Answer Sheet)

Day and Date :

Duration: 3.00 hours
Total Marks : 200

This is to certify that, the entries of MH-CET Roll No. and Answer Sheet No. have been correctly written and verified.

Candidate's Signature   *Invigilator's Signature*

Instructions to Candidates

1. The test contains **50 Multiple Choice Questions (MCQs)** in the **Physics** section.
2. The total time allotted for the examination is **60 minutes**. The countdown timer on the top right of the screen will display the remaining time.
3. Candidates can navigate between questions in the Physics section at any time during the exam.
4. **Login Procedure:** Enter your Roll No. and Password as provided. Verify your name and photograph appearing on the screen. If there is a mismatch, report it to the invigilator immediately.
5. **Navigating Questions:** To select a question, click on the question number in the Question Palette on the right side of the screen.
6. **Answering:** To select your answer, click on the button of one of the options. To deselect, click on the chosen option again or click the **'Clear Response'** button.
7. **Saving:** You **MUST** click the **'Save Next'** button to save your answer for any question. Clicking 'Mark for Review' will not save the answer for final evaluation unless it is specifically answered and saved.
8. **Marking Scheme:**
   - Each correct response is awarded **one (1) mark**.
   - There is **no negative marking** for incorrect answers.
9. Status of questions will be shown by color codes: Green (Answered), Red (Not Answered), White (Not Visited), and Violet (Marked for Review).
10. Candidates are not allowed to open any other software or browser tabs. Doing so will result in the automated locking of the terminal.
11. **Rough Work:** All calculations must be done on the **Scribble Pad** provided. Candidates must write their Roll No. on the pad and return it to the invigilator before leaving the hall.
12. A digital Log Table/Calculator (if applicable) will be accessible via a button on the exam interface.
13. The test will automatically submit once the timer reaches zero. Candidates cannot submit the exam before the first 90 minutes.
14. Use of mobile phones, smartwatches, or any electronic gadgets is strictly prohibited.
15. No marks will be deducted for questions that are left unattempted.

1. In a p-n junction diode, what happens to the width of the depletion region when the forward bias is increased?

   A) It increases.

   B) It decreases.

   C) It remains the same.

   D) It first increases and then decreases.

2. A small object is tied to a string and whirled in a vertical circle of radius L. What should be the minimum speed at the topmost point of the circle so that the string just remains taut?

   A) $\sqrt{2gL}$

   B) $\sqrt{gL}$

   C) $\sqrt{3gL}$

   D) Zero

3. A body of mass 10 kg is moving with a speed of 4 m/s. It is brought to rest by a force in 5 seconds. Calculate the work done by the force.

   A) 40 J

   B) 60 J

   C) 80 J

   D) 100 J

4. A body of mass 5 kg is placed on a frictionless inclined plane of angle $30°$. What is the component of the weight of the body along the plane?

   A) 25 N

   B) 50 N

   C) 45 N

   D) 75 N

5. In a parallel combination of resistors, given the voltage, find the current flowing through the circuit.

   A) $I = \dfrac{V}{R_{\text{total}}}$

   B) $I = V R_{\text{total}}$

   C) $I = \dfrac{V}{R_1}$

   D) $I = \dfrac{V}{R_1 + R_2}$

6. A projectile is fired with an initial speed of $20\,\text{m/s}$ at an angle of $30°$ above the horizontal. Find the maximum height reached by the projectile.

   A) $10\,\text{m}$

   B) $20\,\text{m}$

   C) $5\,\text{m}$

   D) $15\,\text{m}$

7. A fluid of density $800\,\text{kg/m}^3$ is flowing through a pipe of varying cross-sectional area. The velocity of the fluid at point A is $2\,\text{m/s}$, and the velocity at point B is $4\,\text{m/s}$. If the cross-sectional area at point A is $1\,\text{m}^2$, find the cross-sectional area at point B.

   A) $0.5\,\text{m}^2$ B) $1.5\,\text{m}^2$

   C) $2.0\,\text{m}^2$ D) $4.0\,\text{m}^2$

8. A mixture of one mole of monoatomic gas and one mole of diatomic gas (rigid) are kept at room temperature (27°C). The ratio of specific heat of gases at constant volume respectively is:

   A) $\frac{7}{5}$ B) $\frac{3}{2}$

   C) $\frac{3}{5}$ D) $\frac{5}{3}$

9. Approximate value of $\cos 59^\circ$ is:

   A) 0.50   B) 0.61

   C) 0.75   D) 0.85

10. A coil has 200 turns and an area of $0.01\,\text{m}^2$. If the magnetic field changes from 0 to 0.5 T in 0.1 seconds, what is the induced emf in the coil?

    A) 1 V   B) 0.5 V

    C) 2 V   D) 5 V

11. A car of mass 800 kg is moving in a circular path with a radius of 50 m at a speed of 20 m/s. Calculate the centripetal force acting on the car.

    A) 6400 N   B) 3200 N

    C) 8000 N   D) 4000 N

12. An object is dropped from a helicopter flying horizontally at 360 km/h. It falls from a height of 2 km and reaches the ground in 20 seconds. What is the displacement of the package relative to the helicopter's position when it was dropped?

    A) 2 km   B) $2\sqrt{2}\,\text{km}$

    C) 4 km   D) 8 km

13. Two charges $q_1 = 2\,\mu C$ and $q_2 = -3\,\mu C$ are placed 10 cm apart in a vacuum. What is the magnitude and direction of the force between them?

A) $5.4\,N$, Attractive

B) $5.4\,N$, Repulsive

C) $4.8\,N$, Attractive

D) $4.8\,N$, Repulsive

14. What is the angular frequency ω of a simple harmonic oscillator with mass m and spring constant k?

A) $\sqrt{\dfrac{k}{m}}$

B) $\sqrt{\dfrac{m}{k}}$

C) $\dfrac{k}{m}$

D) $\dfrac{m}{k}$

15. A particle is executing Simple Harmonic Motion (SHM). The ratio of potential energy and kinetic energy of the particle when its displacement is half of its amplitude will be:

A) $1:1$

B) $2:1$

C) $1:4$

D) $1:3$

16. A block of mass $5\,kg$ is placed on a horizontal surface. The coefficient of friction between the block and the surface is 0.4. What is the force of friction acting on the block?

A) $20\,N$

B) $15\,N$

C) $10\,N$

D) $25\,N$

17. A thin circular disc of mass M and radius R is rotating in a horizontal plane about an axis passing through its center and perpendicular to its plane with angular velocity ω. If another disc of the same dimensions but of mass $M/2$ is placed gently on the first disc co-axially, then the new angular velocity of the system is:

A) $\dfrac{4}{5}\omega$

B) $\dfrac{5}{4}\omega$

C) $\dfrac{2}{3}\omega$

D) $\dfrac{3}{2}\omega$

18. If M is the mass of water that rises in a capillary tube of radius r, then the mass of water which will rise in a capillary tube of radius $2r$ is:

A) M
B) $\frac{M}{2}$

C) $4M$
D) $2M$

19. "The height from Earth's surface at which acceleration due to gravity becomes $g/4$, where g is acceleration due to gravity on the surface of Earth and R is the radius of Earth?"

A) $\sqrt{2}R$.
B) R.

C) $R/\sqrt{2}$.
D) $2R$.

20. Light emerges out of a convex lens when a source of light is kept at its focus. The shape of the wavefront of the light is:

A) Both spherical and cylindrical
B) Cylindrical

C) Spherical
D) Plane

21. A 0.2 kg ball is dropped from a height of 10 meters. What is the velocity of the ball just before it hits the ground? (Assume $g = 9.8\,\text{m/s}^2$ and neglect air resistance.)

A) $14.0\,\text{m/s}$
B) $9.8\,\text{m/s}$

C) $20.0\,\text{m/s}$
D) $5.0\,\text{m/s}$

22. Three-point charges Q, q, and $-q$ are kept at the vertices of an equilateral triangle of side L. What is the total electrostatic potential energy of the system?

A) $\frac{kQ^2}{a}$
B) 0

C) $-\frac{kq^2}{L}$
D) $\frac{a}{3kQ^2}$

23. A 2 kg object is hanging vertically from a rope. The tension in the rope is 15 N. What is the acceleration of the object? (Assume $g = 9.8\,\text{m/s}^2$)

A) $2.3\,\text{m/s}^2$
B) $2.0\,\text{m/s}^2$

C) $0.5\,\text{m/s}^2$
D) $3.0\,\text{m/s}^2$

24. How much time does a particle at $x = C$ take to go from the mean position to the extreme (maximum displacement) for the first time?

A) $T/2$

B) $T/4$

C) $T/3$

D) T

25. An object of mass $0.5\,\mathrm{kg}$ is moving with a velocity of $10\,\mathrm{m/s}$. What is the momentum of the object?

A) $5\,\mathrm{kg \cdot m/s}$

B) $10\,\mathrm{kg \cdot m/s}$

C) $50\,\mathrm{kg \cdot m/s}$

D) $0.5\,\mathrm{kg \cdot m/s}$

26. A gas expands from an initial volume of $V_1 = 1\,\mathrm{m}^3$ to a final volume of $V_2 = 3\,\mathrm{m}^3$ under constant pressure of $P = 2\,\mathrm{atm}$. What is the work done by the gas during this expansion?

A) $4 \times 10^5\,\mathrm{J}$

B) $6 \times 10^5\,\mathrm{J}$

C) $2 \times 10^5\,\mathrm{J}$

D) $1 \times 10^5\,\mathrm{J}$

27. A fluid flows through a pipe with a varying cross-sectional area. If the velocity of the fluid is $v_1 = 4\,\mathrm{m/s}$ at a point where the cross-sectional area is $A_1 = 2\,\mathrm{m}^2$, and the velocity at another point where the cross-sectional area is $A_2 = 1\,\mathrm{m}^2$ is v_2, what is the velocity v_2?

A) $8\,\mathrm{m/s}$

B) $4\,\mathrm{m/s}$

C) $2\,\mathrm{m/s}$

D) $1\,\mathrm{m/s}$

28. A particle is moving with a constant velocity of $5\,\mathrm{m/s}$ in a circular path of radius $2\,\mathrm{m}$. What is the centripetal acceleration of the particle?

A) $1.25\,\mathrm{m/s}^2$

B) $12.5\,\mathrm{m/s}^2$

C) $5\,\mathrm{m/s}^2$

D) $10\,\mathrm{m/s}^2$

29. A 5 kg block is placed on a horizontal surface. A force of 10 N is applied to the block. The coefficient of friction between the block and the surface is 0.2. Find the acceleration of the block.

A) $0.04\,\text{m/s}^2$ **B)** $1.0\,\text{m/s}^2$

C) $2.0\,\text{m/s}^2$ **D)** $1.5\,\text{m/s}^2$

30. A uniform circular disc of mass 2 kg and radius 0.5 m is mounted on a frictionless axle. A force of 4 N is applied tangentially at the rim for 2 seconds. Find the angular velocity acquired by the disc at the end of 2 seconds.

A) 8 rad/s   **B)** 10 rad/s

C) 12 rad/s   **D)** 16 rad/s

31. The magnetic flux through a coil perpendicular to its plane is varying according to the relation $\phi = 5t^3 + 4t^2 + 2t - 5$. If the resistance of the coil is 5 Ω, then the induced current through the coil at $t = 2\,\text{sec}$ will be:

A) 15.6 A   **B)** 16.6 A

C) 17.6 A   **D)** 18.6 A

32. A particle performs SHM, having a speed of 6 cm/sec at the mean position and an amplitude of 4 cm. Find the position of the particle from the mean position when its velocity is 2 cm/sec.

A) 2 cm   **B)** 3 cm

C) 4 cm   **D)** 1 cm

33. Given the voltage equation $V = 100\sqrt{2}\sin(\omega t)$ and capacitance $C = 2\,\mu\text{F}$, calculate the RMS current.

A) 10 A   **B)** 20 A

C) 50 A   **D)** 100 A

34. Two charges, $q_1 = +3\,\mu C$ and $q_2 = -4\,\mu C$, are placed 20 cm apart. Calculate the force between the charges.

A) 2.45 N

B) 1.35 N

C) 3.5 N

D) 4.2 N

35. Water is flowing through a horizontal pipe in streamline flow. At the narrowest part of the pipe:

A) Velocity is maximum and pressure is minimum.

B) Pressure is maximum and velocity is minimum.

C) Both pressure and velocity are minimum.

D) Both pressure and velocity are maximum.

36. A 200 g sample of water at 80°C is mixed with 100 g of water at 20°C. Assuming no heat loss to the surroundings, what is the final temperature of the mixture?

A) 50°C

B) 60°C

C) 55°C

D) 45°C

37. A closed organ pipe (closed at one end) is excited to support the third overtone. It is found that air in the pipe has:

A) Three nodes and three antinodes

B) Three nodes and four antinodes

C) Four nodes and three antinodes

D) Four nodes and four antinodes

38. What is the output of a NAND gate when both inputs are HIGH?

A) HIGH

B) LOW

C) Alternates between HIGH and LOW

D) Indeterminate

39. A 5 kg block is placed on a horizontal surface. A force of 10 N is applied to the block. The coefficient of friction between the block and the surface is 0.2. Find the acceleration of the block.

A) $0.04\,\mathrm{m/s}^2$

B) $1.0\,\mathrm{m/s}^2$

C) $2.0\,\mathrm{m/s}^2$

D) $1.5\,\mathrm{m/s}^2$

40. A wire has a resistance of $10\,\Omega$ at $20°\mathrm{C}$. If the temperature coefficient of resistance of the material is $0.004\,\mathrm{per}°\mathrm{C}$, what is the resistance of the wire at $50°\mathrm{C}$?

A) $12\,\Omega$ **B)** $10.6\,\Omega$

C) $15\,\Omega$ **D)** $20\,\Omega$

41. Point charge of $10\,\mu C$ is placed at the origin. At what location on the X-axis should a point charge of $40\,\mu C$ be placed so that the net electric field is zero at $x = 2\,\mathrm{cm}$ on the X-axis?

A) $6\,\mathrm{cm}$ **B)** $4\,\mathrm{cm}$

C) $8\,\mathrm{cm}$ **D)** $-4\,\mathrm{cm}$

42. A block slides down a smooth inclined plane and its acceleration is found to be half the acceleration due to gravity. What is the angle of inclination θ of the plane?

A) $45°$ **B)** $60°$

C) $30°$ **D)** $90°$

43. A copper block of mass 2 kg is heated from 20°C to 100°C. If the specific heat capacity of copper is $400\,\mathrm{J/kg}°\mathrm{C}$, how much heat energy is absorbed by the block? (Assume no phase change occurs.)

A) $6400\,\mathrm{J}$ **B)** $16000\,\mathrm{J}$

C) $32000\,\mathrm{J}$ **D)** $64000\,\mathrm{J}$

44. The electrostatic potential due to an electric dipole at a distance r varies as:

A) r **B)** $\frac{1}{r^2}$

C) $\frac{1}{r^3}$ **D)** $\frac{1}{r}$

45. Water is being poured at the rate of $36\,\mathrm{m^3/min}$ into a cylindrical vessel whose circular base is of radius 3 meters. Then the water level in the cylinder increases at the rate of:

A) $\frac{4}{\pi}\,\mathrm{m/min}$ **B)** $4\pi\,\mathrm{m/min}$

C) $\frac{1}{4\pi}\,\mathrm{m/min}$ **D)** $\frac{\pi}{4}\,\mathrm{m/min}$

46. If a copper rod carries a direct current, the magnetic field associated with the current will be?

A) Parallel to the rod   **B)** Perpendicular to the rod

C) Circular around the rod   **D)** No magnetic field

47. A block of mass 2 kg is acted upon by a net force of 10 N. What is its acceleration?

A) 2 m/s^2 **B)** 5 m/s^2

C) 10 m/s^2 **D)** 20 m/s^2

48. An ice cube has a bubble inside. When viewed from one side, the apparent distance of the bubble is $12\,\text{cm}$. When viewed from the opposite side, the apparent distance of the bubble is $4\,\text{cm}$. If the side of the ice cube is $24\,\text{cm}$, the refractive index of the ice cube is:

A) $\frac{4}{3}$ **B)** $\frac{3}{2}$

C) $\frac{2}{3}$ **D)** $\frac{6}{5}$

49. A car travels at a speed of $72\,\text{km/h}$. What is the car's speed in meters per second?

A) $20\,\text{m/s}$ **B)** $18\,\text{m/s}$

C) $25\,\text{m/s}$ **D)** $30\,\text{m/s}$

50. $I_g = 8\% \times I$. What is S (shunt) connected in terms of G?

A) $\frac{G}{11}$ **B)** $\frac{2G}{23}$

C) $\frac{3G}{25}$ **D)** $\frac{4G}{29}$

PHYSICS ANSWER KEY

1. (B)	2. (B)	3. (C)	4. (A)	5. (A)
6. (A)	7. (A)	8. (C)	9. (B)	10. (A)
11. (A)	12. (B)	13. (A)	14. (A)	15. (D)
16. (A)	17. (C)	18. (D)	19. (B)	20. (D)
21. (A)	22. (C)	23. (A)	24. (B)	25. (A)
26. (A)	27. (A)	28. (B)	29. (A)	30. (D)
31. (A)	32. (C)	33. (A)	34. (A)	35. (A)
36. (A)	37. (D)	38. (B)	39. (A)	40. (A)
41. (A)	42. (C)	43. (C)	44. (B)	45. (A)
46. (C)	47. (B)	48. (B)	49. (A)	50. (B)