MHT CET 2026 Physics Sample Paper 3

Question Booklet Version **3** (Write this number on your Answer Sheet)	MH-CET-2026 Roll No.		Question Booklet Sr. No.
			(Write this number on your Answer Sheet)
	Answer Sheet No.		

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. 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) $\frac{6}{5}$

2. A charge of $2\,\mu\text{C}$ is placed in an electric field of intensity $4 \times 10^3\,\text{N/C}$. What is the force experienced by the charge?

   A) $8 \times 10^{-3}\,\text{N}$ B) $8 \times 10^{-6}\,\text{N}$

   C) $4 \times 10^{-3}\,\text{N}$ D) $4 \times 10^{-6}\,\text{N}$

3. A concave mirror has a focal length of 20 cm. An object is placed 60 cm in front of the mirror. Find the image distance.

   A) $30\,\text{cm}$ B) $40\,\text{cm}$

   C) $60\,\text{cm}$ D) $80\,\text{cm}$

4. Two projectiles are projected at $30°$ and $60°$ with the horizontal with the same speed. The ratio of the maximum height attained by the two projectiles respectively is:

   A) $2 : \sqrt{3}$ B) $\sqrt{3} : 1$

   C) $1 : 3$ D) $1 : \sqrt{3}$

5. A light-emitting diode (LED) is fabricated using GaAs semiconductor material whose band gap is $1.42\,\text{eV}$. The wavelength of light emitted from the LED is:

   A) $650\,\text{nm}$ B) $1243\,\text{nm}$

   C) $875\,\text{nm}$ D) $1400\,\text{nm}$

6. The potential energy of a particle performing linear S.H.M is $0.1\pi^2 x^2$ joules. If the mass of the particle is $20\,\text{g}$, find the frequency of S.H.M:

   A) $0.4\,\text{Hz}$ B) $0.6\,\text{Hz}$

   C) $1.581\,\text{Hz}$ D) $2.0\,\text{Hz}$

7. The gravitational potential energy of a 2 kg object at a height of 5 m above the surface of the Earth is?

   A) 100 J   B) 150 J

   C) 50 J   D) 25 J

8. \(
   A car starts from rest and accelerates uniformly at 3 m/s^{2. What will be its velocity after 5 seconds?}
   \)

   A) 10 m/s   B) 15 m/s

   C) 20 m/s   D) 30 m/s

9. A circular coil of 50 turns, each of radius 0.1 m, carries a current of 2 A. If the coil is placed in a uniform magnetic field of 0.5 T perpendicular to its plane, what is the magnitude of the torque acting on the coil?

   A) $0.157\,\mathrm{Nm}$ B) $0.785\,\mathrm{Nm}$

   C) $1.57\,\mathrm{Nm}$ D) $3.14\,\mathrm{Nm}$

10. A gas in a cylinder is compressed from an initial volume of $5\,\mathrm{m}^3$ to a final volume of $2\,\mathrm{m}^3$ while maintaining a constant pressure of $1 \times 10^5\,\mathrm{Pa}$. Calculate the work done by the gas during the compression.

    A) $-3 \times 10^5\,\mathrm{J}$ B) $-1 \times 10^5\,\mathrm{J}$

    C) $3 \times 10^5\,\mathrm{J}$ D) $1 \times 10^5\,\mathrm{J}$

11. Two point charges $+2\,\mu\mathrm{C}$ and $-3\,\mu\mathrm{C}$ are placed 10 cm apart in vacuum. What is the electrostatic force between them?

    A) 4.5 N   B) 9 N

    C) 18 N   D) 2.25 N

12. 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

13. A lens has focal length $f = 20\,\text{cm}$. What is the power of the lens?

A) $+5\,\text{D}$

B) $+10\,\text{D}$

C) $-5\,\text{D}$

D) $-10\,\text{D}$

14. An AC voltage $V = 50\sqrt{2}\sin(100t)$ is applied across a capacitor of capacitance $C = 1\mu F$. What is the rms value of the current through the capacitor?

A) $0.0025\,\text{A}$

B) $0.01\,\text{A}$

C) $0.005\,\text{A}$

D) $0.007\,\text{A}$

15. 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

16. A water tank is open at the top and has a hole of area $10^{-4}\,\text{m}^2$ at the bottom. The height of the water column is 5 m. What is the speed of the water flowing out of the hole? (Take $g = 10\,\text{m/s}^2$)

A) 5 m/s

B) 10 m/s

C) 15 m/s

D) 20 m/s

17. A particle performs simple harmonic motion with amplitude A. Its speed is tripled at the instant that it is at a distance $\frac{2A}{3}$ from the equilibrium position. The new amplitude of the motion is:

A) $A\sqrt{3}$

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

C) $\frac{A}{3}\sqrt{41}$

D) $3A$

18. The height from Earth's surface at which acceleration due to gravity becomes $\frac{g}{4}$ is ___? (Where g is the acceleration due to gravity on the surface of the Earth and R is the radius of the Earth.)

A) $\sqrt{2}R$.

B) R.

C) $\frac{R}{\sqrt{2}}$.

D) $2R$.

19. A 5 Ω resistor and a 10 Ω resistor are connected in parallel. What is the equivalent resistance of the combination?

A) 3.33 Ω

B) 15 Ω

C) 7.5 Ω

D) 2 Ω

20. 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

21. 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

22. A wire of length L and resistance R is falling vertically through Earth's horizontal magnetic field B. What is the current induced in the wire when it has fallen a height L? (Take acceleration due to gravity as g)

A) $\dfrac{BL\sqrt{2gL}}{R}$

B) $\dfrac{B\sqrt{2gL}}{R}$

C) $\dfrac{BL^2\sqrt{2g}}{R}$

D) $\dfrac{BLg}{R}$

23. Sphere of color black, red, white, and yellow are heated to the same temperature. The decreasing order of cooling is:

A) $Black > Red > Yellow > White$

B) $Red > Black > White > Yellow$

C) $White > Yellow > Red > Black$

D) $Yellow > White > Red > Black$

24. 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

25. For a system of particles in thermal equilibrium, what is the probability that a particle will have energy greater than E_0 according to the Boltzmann distribution?

A) $e^{-\frac{E_0}{kT}}$

B) $1 - e^{-\frac{E_0}{kT}}$

C) $e^{\frac{E_0}{kT}}$

D) $1 + e^{\frac{E_0}{kT}}$

26. Relative permittivity and permeability of a material are ε_r and μ_r, respectively. Which of the following values of these quantities are allowed for a diamagnetic material?

A) $\varepsilon_r = 0.5, \mu_r = 1.5$

B) $\varepsilon_r = 1.5, \mu_r = 0.5$

C) $\varepsilon_r = 0.5, \mu_r = 0.5$

D) $\varepsilon_r = 1.5, \mu_r = 1.5$

27. A body moves in a circle of radius $r = 5$ m with a constant speed of $v = 10$ m/s. What is the centripetal acceleration of the body?

A) $20 \, \text{m/s}^2$

B) $5 \, \text{m/s}^2$

C) $10 \, \text{m/s}^2$

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

28. A spaceship moves with a velocity of 5000 m/s. What is the relativistic factor γ for the spaceship? (Given that $c = 3 \times 10^8$ m/s)

A) 1.0001

B) 1.001

C) 1.0005

D) 1.00001

29. A force of 20 N is applied to a body at an angle of $30°$ to the horizontal, moving the body a distance of 5 m. What is the work done by the force?

A) 100 J

B) 50 J

C) 200 J

D) 150 J

30. A stone is thrown horizontally from the top of a tower with a speed of 10 m/s. If the height of the tower is 45 m, how much time will the stone take to reach the ground?

A) 3 s

B) 4 s

C) 5 s

D) 2 s

31. The fundamental frequency of a closed organ pipe of length $20\,\mathrm{cm}$ is equal to the second overtone of an organ pipe open at both ends. What is the length of the organ pipe open at both ends?

A) $1.0\,\mathrm{m}$ **B)** $1.2\,\mathrm{m}$

C) $1.4\,\mathrm{m}$ **D)** $1.6\,\mathrm{m}$

32. A coil of 100 turns, carrying a current of $5\,\mathrm{A}$, is placed in a magnetic field of $2\,\mathrm{T}$. The area of each turn is $0.01\,\mathrm{m}^2$. What is the magnetic moment of the coil?

A) $0.5\,\mathrm{A}\cdot\mathrm{m}^2$ **B)** $1.0\,\mathrm{A}\cdot\mathrm{m}^2$

C) $2.0\,\mathrm{A}\cdot\mathrm{m}^2$ **D)** $5.0\,\mathrm{A}\cdot\mathrm{m}^2$

33. What is the gravitational force between two objects of masses $m_1 = 10\,\mathrm{kg}$ and $m_2 = 20\,\mathrm{kg}$, separated by a distance of $r = 5\,\mathrm{m}$? (Gravitational constant $G = 6.67 \times 10^{-11}\,\mathrm{N}\,\mathrm{m}^2/\mathrm{kg}^2$)

A) $5.33 \times 10^{-10}\,\mathrm{N}$ **B)** $2.67 \times 10^{-9}\,\mathrm{N}$

C) $4.67 \times 10^{-9}\,\mathrm{N}$ **D)** $1.33 \times 10^{-9}\,\mathrm{N}$

34. The mass of an object is measured as (28 ± 0.01) g and its volume as (5 ± 0.1) cm^3. What is the percentage error in density?

A) $1.20\,\%$ **B)** $0.35\,\%$

C) $2.04\,\%$ **D)** $0.71\,\%$

35. A steel wire with mass per unit length $7.0 \times 10^{-3}\,\mathrm{kg/m}$ is under a tension of $70\,\mathrm{N}$. The speed of transverse waves in the wire will be:

A) $100\,\mathrm{m/s}$ **B)** $50\,\mathrm{m/s}$

C) $10\,\mathrm{m/s}$ **D)** $200\pi\,\mathrm{m/s}$

36. A force of 10 N is applied to move a body of mass 5 kg over a distance of 3 meters. Find the work done by the force.

A) 20 J   **B)** 30 J

C) 40 J   **D)** 50 J

37. A car accelerates uniformly from rest and attains a velocity of $20\,\text{m/s}$ in 10 seconds. What is the acceleration of the car?

A) $2\,\text{m/s}^2$ **B)** $1\,\text{m/s}^2$

C) $4\,\text{m/s}^2$ **D)** $5\,\text{m/s}^2$

38. A particle is moving with a constant velocity of 5 m/s in a circular path of radius 2 m. What is the centripetal acceleration of the particle?

A) $1.25\ \text{m/s}^2$ **B)** $2.5\ \text{m/s}^2$

C) $5\ \text{m/s}^2$ **D)** $10\ \text{m/s}^2$

39. 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) $25\,\text{N}$ **B)** $50\,\text{N}$

C) $45\,\text{N}$ **D)** $75\,\text{N}$

40. A current of 2 A flows through a conductor with a resistance of 5 Ω. Calculate the potential difference across the conductor.

A) 10 V   **B)** 5 V

C) 2 V   **D)** 20 V

41. In a Young's double-slit experiment, the distance between the slits is $0.2\,\text{mm}$ and the distance between the screen and the slits is $2\,\text{m}$. If the wavelength of the light used is $600\,\text{nm}$, calculate the distance between the two adjacent bright fringes.

A) $0.3\,\text{mm}$ **B)** $0.6\,\text{mm}$

C) $1.2\,\text{mm}$ **D)** $1.5\,\text{mm}$

42. A 10 kg box is pulled with a horizontal force of 50 N on a surface offering a frictional force of 20 N. What is the net acceleration of the box? (Take $g = 10\,\text{m/s}^2$)

A) $2\ \text{m/s}^2$ **B)** $3\ \text{m/s}^2$

C) $5\ \text{m/s}^2$ **D)** $7\ \text{m/s}^2$

43. A solid cylinder and a hollow cylinder, each of mass M and radius R, are rotating with the same angular velocity ω. What is the ratio of their rotational kinetic energies $\left(\frac{K_{\text{hollow}}}{K_{\text{solid}}} \right)$?

A) 1　　　　　　　　　　　　　　**B)** 2

C) 3　　　　　　　　　　　　　　**D)** 3/2

44. A metallic sphere of radius R is charged to a potential V. The magnitude of the electric field at a distance r $(r > R)$ from the center of the sphere is:

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

C) $\frac{V}{R^2}$　　　　　　　　　　　　**D)** $\frac{V}{r}$

45. Eight equal drops of water are falling through air with a steady speed of $10\,\text{cm/s}$. If the drops coalesce, the new velocity is:

A) $10\,\text{cm/s}$　　　　　　　　　　**B)** $40\,\text{cm/s}$

C) $16\,\text{cm/s}$　　　　　　　　　　**D)** $5\,\text{cm/s}$

46. Two spherical black bodies radiate the same amount of heat per second. If their temperatures are T_1 and T_2, and their radii are R_1 and R_2, respectively, find the relation between their temperatures and radii.

A) $T_1 = \sqrt{2}T_2$　　　　　　　　　**B)** $T_1 = 2T_2$

C) $T_1 = \frac{T_2}{\sqrt{2}}$　　　　　　　　　**D)** $T_1 = \sqrt{3}T_2$

47. 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 $x = 2\,\text{cm}$ on the X-axis?

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

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

48. \(
In Young's double slit experiment, we get 15 fringes per cm on the screen, using light of wavelength 5600 \AA. For the same setting, how many fringes per cm will be obtained with light of wavelength 7000 \AA?
\)

A) 10　　　　　　　　　　　　　　**B)** 12

C) 15　　　　　　　　　　　　　　**D)** 18

49. \(

In an a.c. circuit, voltage and current are given by:

$$V = 100\sin(100t)\,\text{V} \quad \text{and} \quad I = 100\sin\left(100t + \frac{\pi}{3}\right)\text{mA}.$$

The average power dissipated in one cycle is:

\)

A) 10 W

B) 2.5 W

C) 25 W

D) 5 W

50. 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) $3.0\,\text{m/s}^2$

PHYSICS ANSWER KEY

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