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MHT CET 2025 Apr 22 Shift 1 Question Paper

Time Allowed :3 Hour	Maximum Marks :200	Total Questions :200

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test is of 3 hours duration.
2. The question paper consists of 150 questions. The maximum marks are 200.
3. There are three parts in the question paper consisting of Physics, Chemistry and Mathematics having 50 questions in each part of equal weightage.

1. A body of mass $m = 2$ kg is moving with a velocity of 5 m/s. What is the kinetic energy of the body?

(1) 25 J

(2) 10 J

(3) 50 J

(4) 100 J

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2. A simple pendulum has a length of $L = 2$ m. What is the time period of the pendulum? (Assume $g = 9.8$ m/s^2)

(1) 2 s

(2) 1 s

(3) 3 s

(4) 4 s

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

(1) $3.33\,\Omega$

(2) $15\,\Omega$

(3) $7.5\,\Omega$

(4) $2\,\Omega$

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4. An object of mass 0.5 kg is moving with a velocity of 10 m/s. What is the momentum of the object?

(1) $5\,\text{kg} \cdot \text{m/s}$

(2) $10\,\text{kg} \cdot \text{m/s}$

(3) $50\,\text{kg} \cdot \text{m/s}$

(4) $0.5\,\text{kg} \cdot \text{m/s}$

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5. A metal rod of length $L = 0.8$ m is rotating about its center with an angular velocity $\omega = 10$ rad/s. What is the linear velocity of a point on the rod at a distance $r = 0.4$ m from the center?

(1) 4 m/s

(2) 8 m/s

(3) 2 m/s

(4) 6 m/s

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6. A 10 μC charge is placed in an electric field of 5×10^3 N/C. What is the force experienced by the charge?

(1) 5×10^{-2} N

(2) 5×10^{-3} N

(3) 5×10^{2} N

(4) 5×10^{4} N

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7. A body of mass 1.5 kg is dropped from a height of 20 m. What is its speed just before hitting the ground? (Assume $g = 9.8$ m/s^2)

(1) 19.8 m/s

(2) 14 m/s

(3) 20 m/s

(4) 9.8 m/s

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8. A 2 kg mass is attached to a spring with spring constant $k = 200$ N/m. If the mass is

displaced by 0.1 m, what is the potential energy stored in the spring?

(1) 1 J

(2) 0.5 J

(3) 2 J

(4) 0.2 J

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9. A car travels at a speed of 72 km/h. What is the car's speed in meters per second?

(1) 20 m/s

(2) 18 m/s

(3) 25 m/s

(4) 30 m/s

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10. What is the molar mass of sulfur dioxide (SO_2)?

(1) 64 g/mol

(2) 32 g/mol

(3) 48 g/mol

(4) 44 g/mol

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11. Which of the following is the correct order of increasing acidity for the following compounds? CH_3OH, CH_3COOH, HCl, and H_2SO_4.

(1) $CH_3OH < CH_3COOH < HCl < H_2SO_4$

(2) $CH_3OH < HCl < CH_3COOH < H_2SO_4$

(3) $HCl < CH_3OH < CH_3COOH < H_2SO_4$

(4) $H_2SO_4 < CH_3COOH < HCl < CH_3OH$

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12. What is the pH of a 0.001 M solution of hydrochloric acid (HCl)?

(1) 3

(2) 1

(3) 7

(4) 4

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13. Which of the following is the correct electron configuration for an oxygen atom?

(1) $1s^2 2s^2 2p^4$

(2) $1s^2 2s^2 2p^6$

(3) $1s^2 2s^2 2p^5$

(4) $1s^2 2s^2 2p^3$

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14. What is the empirical formula of glucose, whose molecular formula is $C_6H_{12}O_6$?

(1) CH_2O

(2) $C_2H_4O_2$

(3) $C_3H_6O_3$

(4) $C_6H_6O_3$

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15. How many grams of NaOH are required to neutralize 25 mL of 0.1 M HCl solution?

(1) 0.25 g

(2) 0.5 g

(3) 1.0 g

(4) 2.0 g

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16. Find the value of x that satisfies the equation $2x + 3 = 11$.

(1) 4

(2) 5

(3) 6

(4) 7

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17. Find the roots of the quadratic equation $x^2 - 5x + 6 = 0$.

(1) $x = 2, 3$

(2) $x = 1, 6$

(3) $x = -2, 3$

(4) $x = -1, -6$

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18. Find the value of $\log_2 32$.

(1) 5

(2) 6

(3) 4

(4) 3

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19. If $\tan\theta = \frac{3}{4}$, find the value of $\sin\theta$.

(1) $\frac{3}{5}$

(2) $\frac{4}{5}$

(3) $\frac{5}{4}$

(4) $\frac{3}{4}$

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20. If $f(x) = 3x^2 + 5x - 7$, find $f(2)$.

(1) 9

(2) 15

(3) 7

(4) 5

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21. Solve for x in the equation $\frac{1}{x+3} + \frac{1}{x+5} = \frac{1}{6}$.

(1) $x = 1$

(2) $x = -1$

(3) $x = -4$

(4) $x = 3$

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22. Find the area of a triangle with base 12 cm and height 5 cm.

(1) $30\,\text{cm}^2$

(2) $60\,\text{cm}^2$

(3) $24\,\text{cm}^2$

(4) $15\,\text{cm}^2$
