MHT CET 2025 Apr 22 Shift 1 Question Paper

Time Allowed :3 HourMaximum Marks :200Total 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

2. A simple pendulum has a length of L = 2 m. What is the time period of the pendulum? (Assume g = 9.8 m/s²)
(1) 2 s
(2) 1 s
(3) 3 s
(4) 4 s

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) 15Ω
- (3) 7.5Ω

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 kg · m/s
(2) 10 kg · m/s

- (3) $50 \text{ kg} \cdot \text{m/s}$
- (4) $0.5 \text{ kg} \cdot \text{m/s}$

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

6. A 10 μ C 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

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 $g = 9.8 \text{ m/s}^2$)

- (1) 19.8 m/s
- (2) 14 m/s
- (3) 20 m/s
- (4) 9.8 m/s

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

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

10. What is the molar mass of sulfur dioxide (SO₂?

- (1) 64 g/mol
- (2) 32 g/mol
- (3) 48 g/mol
- (4) 44 g/mol

11. Which of the following is the correct order of increasing acidity for the following compounds? CH₃OH, CH₃COOH, HCl, and H₂SO₄.

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

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

- $(3) \ HCl < CH_3OH < CH_3COOH < H_2SO_4$
- $(4) \ H_2 SO_4 < CH_3 COOH < HCl < CH_3 OH$

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

(1) 3

- (2) 1
- (3) 7
- (4) 4

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

(1) $1s^22s^22p^4$ (2) $1s^22s^22p^6$ (3) $1s^22s^22p^5$

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

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

- $(1) CH_2O$
- (2) $C_2H_4O_2$
- $(3) C_3 H_6 O_3$
- (4) $C_6 H_6 O_3$

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

- (1) 0.25 g
- (2) $0.5 \,\mathrm{g}$
- (3) 1.0 g
- (4) 2.0 g

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

- (1)4
- (2) 5
- (3) 6
- (4) 7

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

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

(1) 5

(2) 6

(3) 4(4) 3

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) $\frac{3}{4}$

20. If f(x) = 3x² + 5x - 7, find f(2).
(1) 9
(2) 15
(3) 7
(4) 5

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

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

- (1) $30 \,\mathrm{cm}^2$
- (2) $60 \, \text{cm}^2$
- (3) $24 \,\mathrm{cm}^2$
- (4) $15 \,\mathrm{cm}^2$