MHT CET 2025 Memory Based Question Paper PDF (April 22, 2025) (Shift 1)

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/s^2)

(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 Ω

(2) 15 Ω

(3) 7.5 Ω

(4) 2 Ω

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 kg · m/s

(4) 0.5 kg · 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 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

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

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 (SO_2)?

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

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

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

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

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

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) $C_6H_6O_3$

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

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 $f(x)=3x^2+5x-7$, 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 cm^2

(2) 60 cm^2

(3) 24 cm^2

(4) 15 cm^2