

MHT CET 2025 Memory Based Question Paper PDF (April 16, 2025) (Shift 2)

1. A simple pendulum of length 1 m is oscillating with a small amplitude. If the acceleration due to gravity is 9.8 m/s^2 , what is the time period of the pendulum?
 - (1) 1.0 s
 - (2) 2.0 s
 - (3) 3.0 s
 - (4) 4.0 s
2. A wire of length 2 m and resistance 8Ω is stretched to double its original length, keeping the volume constant. What is the new resistance of the wire?
 - (1) 16Ω
 - (2) 32Ω
 - (3) 8Ω
 - (4) 4Ω
3. A ball is thrown vertically upwards with an initial velocity of 20 m/s. If the acceleration due to gravity is 10 m/s^2 , what is the maximum height reached by the ball?
 - (1) 10 m
 - (2) 20 m
 - (3) 40 m
 - (4) 80 m
4. Two point charges $+4 \mu\text{C}$ and $-2 \mu\text{C}$ are separated by a distance of 0.3 m in air. What is the magnitude of the electrostatic force between them? (Given: Coulomb's constant $k = 9 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$)
 - (1) 8 N
 - (2) 16 N
 - (3) 24 N
 - (4) 32 N
5. A convex lens has a focal length of 20 cm. An object is placed 30 cm in front of the lens. What is the image distance from the lens?
 - (1) 12 cm
 - (2) 60 cm
 - (3) 15 cm
 - (4) 30 cm

6. A block of mass 5 kg is pulled along a horizontal surface by a force of 20 N at an angle of 30° to the horizontal. If the coefficient of friction between the block and the surface is 0.2 and the acceleration due to gravity is 10 m/s^2 , what is the work done by the applied force in moving the block 10 m?
- (1) 100 J
(2) 173.2 J
(3) 200 J
(4) 346.4 J
7. A copper block of mass 2 kg is heated from 20°C to 100°C . If the specific heat capacity of copper is $400 \text{ J/kg}^\circ\text{C}$, how much heat energy is absorbed by the block? (Assume no phase change occurs.)
- (1) 6400 J
(2) 16000 J
(3) 32000 J
(4) 64000 J
8. 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?
- (1) $0.157 \text{ N}\cdot\text{m}$
(2) $0.785 \text{ N}\cdot\text{m}$
(3) $1.57 \text{ N}\cdot\text{m}$
(4) $3.14 \text{ N}\cdot\text{m}$
9. What volume of oxygen gas at STP is required to completely burn 12 g of methane (CH_4)? (Molar mass of $\text{CH}_4 = 16 \text{ g/mol}$, 1 mole of gas at STP occupies 22.4 L).
- (1) 11.2 L
(2) 22.4 L
(3) 33.6 L
(4) 44.8 L
10. In an electrochemical cell, the standard electrode potential of Zn^{2+}/Zn is -0.76 V and that of Cu^{2+}/Cu is $+0.34 \text{ V}$. What is the standard EMF of the cell formed by these electrodes?
- (1) 0.42 V
(2) 1.10 V
(3) -1.10 V
(4) -0.42 V
11. Which of the following compounds will give a positive iodoform test?
- (1) Methanol

- (2) Ethanol
(3) Propan-1-ol
(4) Propan-2-ol
12. The enthalpy change for the reaction $\text{C}_2\text{H}_4(\text{g}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$ is -1410 kJ/mol. If the standard enthalpies of formation of $\text{CO}_2(\text{g})$ and $\text{H}_2\text{O}(\text{l})$ are -393.5 kJ/mol and -286 kJ/mol respectively, what is the standard enthalpy of formation of $\text{C}_2\text{H}_4(\text{g})$?
- (1) $+52$ kJ/mol
(2) -52 kJ/mol
(3) $+104$ kJ/mol
(4) -104 kJ/mol
13. What is the molarity of a solution prepared by dissolving 5.85 g of NaCl in water to make 250 mL of solution? (Molar mass of $\text{NaCl} = 58.5$ g/mol).
- (1) 0.1 M
(2) 0.2 M
(3) 0.4 M
(4) 1.0 M
14. The rate constant for a first-order reaction is 0.0693 min^{-1} . What is the half-life of the reaction?
- (1) 5 min
(2) 10 min
(3) 15 min
(4) 20 min
15. The energy of an electron in the second orbit of a hydrogen atom is -3.4 eV. What is the energy of the electron in the third orbit? (Given: Energy of an electron in the n -th orbit of hydrogen is $E_n = -\frac{13.6}{n^2}$ eV).
- (1) -1.51 eV
(2) -2.27 eV
(3) -3.4 eV
(4) -6.04 eV
16. For the reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$, the equilibrium constant K_c is 4.0×10^{-2} at a certain temperature. If the equilibrium concentrations are $[\text{N}_2] = 0.5$ M and $[\text{H}_2] = 1.5$ M, what is the equilibrium concentration of NH_3 ?
- (1) 0.075 M
(2) 0.15 M
(3) 0.30 M
(4) 0.60 M

17. Which of the following coordination compounds exhibits geometrical isomerism?
- (1) $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$
 - (2) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$
 - (3) $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$
 - (4) $[\text{Co}(\text{Cl})_4]^{2-}$
18. In plants, which of the following hormones is primarily responsible for promoting cell elongation in stems?
- (1) Cytokinin
 - (2) Gibberellin
 - (3) Abscissic acid
 - (4) Ethylene
19. Which part of the human nephron is primarily responsible for the reabsorption of glucose and amino acids?
- (1) Bowman's capsule
 - (2) Proximal convoluted tubule
 - (3) Loop of Henle
 - (4) Distal convoluted tubule
20. In recombinant DNA technology, which enzyme is used to cut DNA at specific recognition sites to produce restriction fragments?
- (1) DNA polymerase
 - (2) Restriction endonuclease
 - (3) Ligase
 - (4) Reverse transcriptase
21. Which of the following is a pioneer species in the primary succession of a bare rock?
- (1) Grasses
 - (2) Lichens
 - (3) Shrubs
 - (4) Trees
22. In flowering plants, the process of double fertilization results in the formation of which two structures?
- (1) Embryo and endosperm
 - (2) Embryo and seed coat
 - (3) Endosperm and pollen grain
 - (4) Seed coat and ovule

- 23.** In a DNA molecule, if the percentage of adenine (A) is 30%, what is the percentage of cytosine (C)?
- (1) 20%
 - (2) 30%
 - (3) 40%
 - (4) 50%
- 24.** Which of the following microorganisms is used in the production of curd from milk?
- (1) *Saccharomyces cerevisiae*
 - (2) *Lactobacillus acidophilus*
 - (3) *Aspergillus niger*
 - (4) *Penicillium notatum*
- 25.** Which of the following is an example of homologous structures that provide evidence for evolution?
- (1) Wings of a bird and wings of an insect
 - (2) Forelimbs of a human and wings of a bat
 - (3) Fins of a fish and flippers of a whale
 - (4) Stingers of a bee and spines of a porcupine
- 26.** In the human heart, which chamber receives oxygenated blood from the lungs?
- (1) Right atrium
 - (2) Right ventricle
 - (3) Left atrium
 - (4) Left ventricle
- 27.** Which organelle in a eukaryotic cell is primarily responsible for synthesizing proteins destined for secretion?
- (1) Mitochondrion
 - (2) Rough endoplasmic reticulum
 - (3) Golgi apparatus
 - (4) Lysosome
- 28.** In a cross between a pea plant heterozygous for round seeds (Rr) and a plant with wrinkled seeds (rr), what is the expected phenotypic ratio of the offspring?
- (1) 1 Round : 1 Wrinkled
 - (2) 3 Round : 1 Wrinkled
 - (3) All Round
 - (4) All Wrinkled
- 29.** In flowering plants, which structure develops into the fruit after fertilization?

- (1) Ovary
- (2) Ovule
- (3) Anther
- (4) Stigma

