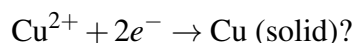


MHT CET 2025 Memory Based Question Paper PDF (April 15, 2025) (Shift 1)

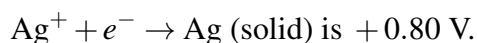
1. A car of mass 1000 kg is moving with a velocity of 20 m/s. The driver applies the brakes, and the car comes to rest in 10 seconds. Find the average force exerted by the brakes to stop the car.
 - (1) 5000 N
 - (2) 2000 N
 - (3) 10000 N
 - (4) 4000 N
2. A 50 kg person climbs a staircase of height 10 m. Calculate the work done by the person against gravity.
 - (1) 5000 J
 - (2) 1000 J
 - (3) 1500 J
 - (4) 3000 J
3. A car of mass 800 kg is moving in a circular path with a radius of 50 m at a speed of 20 m/s. Calculate the centripetal force acting on the car.
 - (1) 6400 N
 - (2) 3200 N
 - (3) 8000 N
 - (4) 4000 N
4. A pipe has a radius of 2 cm at one end and 1 cm at the other end. The velocity of the water at the wider end is 5 m/s. What is the velocity of the water at the narrower end, assuming incompressible flow?
 - (1) 10 m/s
 - (2) 20 m/s
 - (3) 15 m/s
 - (4) 25 m/s
5. A 200 g sample of water at 80°C is mixed with 100 g of water at 20°C. Assuming no heat loss to the surroundings, what is the final temperature of the mixture?

- (1) 50°C
(2) 60°C
(3) 55°C
(4) 45°C
6. A 5-ohm resistor is connected to a 10 V battery. Calculate the current flowing through the resistor.
- (1) 1.0 A
(2) 2.0 A
(3) 0.5 A
(4) 0.2 A
7. What is the pH of a 0.001 M hydrochloric acid (HCl) solution?
- (1) 3
(2) 4
(3) 7
(4) 10
8. How many grams of sodium chloride (NaCl) are produced when 2.0 moles of sodium (Na) react with excess chlorine gas (Cl₂)? The balanced chemical equation for the reaction is:
- $$2 \text{Na(s)} + \text{Cl}_2(\text{g}) \rightarrow 2 \text{NaCl(s)}$$
- (1) 58.5 g
(2) 116.9 g
(3) 117.0 g
(4) 231.5 g
9. A gas occupies a volume of 5.0 L at 300 K and 1.0 atm pressure. What will be the volume of the gas if the pressure is increased to 2.0 atm while the temperature is kept constant?
- (1) 2.5 L
(2) 10.0 L
(3) 5.0 L
(4) 1.0 L

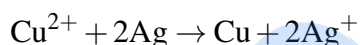
10. What is the standard electrode potential of the half-reaction:



Given that the standard electrode potential for the half-reaction:



Also, the cell potential for the following reaction is:



is 0.46 V.

- (1) 0.34 V
- (2) 0.50 V
- (3) 0.46 V
- (4) 1.0 V

11. For a reaction $\text{A} \rightarrow \text{B}$, the rate law is given by:

$$\text{Rate} = k[\text{A}]^2$$

If the concentration of A is increased by a factor of 3, by what factor does the rate of the reaction increase?

- (1) 3
- (2) 9
- (3) 27
- (4) 6

12. Which of the following is responsible for the production of oxygen during photosynthesis?

- (1) Calvin cycle
- (2) Photolysis of water
- (3) Cyclic photophosphorylation
- (4) Reduction of NADP+

13. In a Mendelian cross between two heterozygous pea plants ($\text{Tt} \times \text{Tt}$), where "T" is the dominant allele for tall plants and "t" is the recessive allele for short plants, what is the probability of obtaining a short plant?

- (1) 0
- (2) $\frac{1}{4}$
- (3) $\frac{1}{2}$
- (4) 1

14. Which part of the human brain is responsible for regulating the body's balance and coordination?

- (1) Cerebrum
- (2) Cerebellum
- (3) Medulla Oblongata
- (4) Thalamus

15. Which of the following is true about transpiration in plants?

- (1) Transpiration helps in the absorption of minerals from the soil.
- (2) Transpiration cools the plant and helps in water regulation.
- (3) Transpiration decreases water absorption from the roots.
- (4) Transpiration occurs only through the roots of the plant.

16. Which hormone is primarily responsible for the development of secondary sexual characteristics in females?

- (1) Estrogen
- (2) Testosterone
- (3) Progesterone
- (4) Oxytocin