MHT CET 2025 Apr 15 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 200 questions. The maximum marks are 200.
3. There are three parts in the question paper consisting of Physics, Chemistry and Biology (Botany and Zoology) having 50 questions in each part of equal weightage.

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

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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

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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

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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

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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

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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

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

(1) 3

(2) 4

(3) 7

(4) 10

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8. How many grams of sodium chloride (NaCl) are produced when 2.0 moles of sodium (Na) react with excess chlorine gas (Cl_2? The balanced chemical equation for the reaction is:

$$2\,\mathrm{Na}(s) + \mathrm{Cl}_2(g) \rightarrow 2\,\mathrm{NaCl}(s)$$

(1) $58.5\,\mathrm{g}$

(2) $116.9\,\mathrm{g}$

(3) $117.0\,\mathrm{g}$

(4) $231.5\,\mathrm{g}$

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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) $2.5\,\mathrm{L}$

(2) $10.0\,\mathrm{L}$

(3) $5.0\,\mathrm{L}$

(4) $1.0\,\mathrm{L}$

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

$$\mathrm{Cu}^{2+} + 2e^- \rightarrow \mathrm{Cu\,(solid)?}$$

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

$$\mathrm{Ag}^{+} + e^- \rightarrow \mathrm{Ag\,(solid)} \quad \text{is } +0.80\,\mathrm{V}.$$

Also, the cell potential for the following reaction is:

$$\mathrm{Cu}^{2+} + 2\mathrm{Ag} \rightarrow \mathrm{Cu} + 2\mathrm{Ag}^{+}$$

is $0.46\,\mathrm{V}$.

(1) $0.34\,\mathrm{V}$

(2) $0.50\,\mathrm{V}$

(3) $0.46\,\mathrm{V}$

(4) $1.0\,\mathrm{V}$

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11. For a reaction A $\rightarrow$ 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

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

A) Calvin cycle

B) Photolysis of water

C) Cyclic photophosphorylation

D) Reduction of NADP+

(1) A Calvin cycle

(2) B Photolysis of water

(3) C Cyclic photophosphorylation

(4) D Reduction of NADP+

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13. In a Mendelian cross between two heterozygous pea plants (Tt x 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

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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

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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.

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

(1) Estrogen

(2) Testosterone

(3) Progesterone

(4) Oxytocin

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