

MHT CET 22 April Shift 1 PCM Paper

Total Time Allowed : 3 hours	Maximum Marks : 200	Total Questions : 200
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General Instructions

Read the following instructions very carefully and strictly follow them:

This question paper is divided into three sections:

1. The total duration of the examination is 3 hours (180 minutes).
2. The total number of questions is **200**, carrying a maximum of **200 marks**.
3. The marking scheme is as follows:
 - (i) For Physics, Chemistry, and Mathematics, 1 mark will be awarded for every correct response.
 - (ii) There is **no negative marking** for any incorrect response.
4. No marks will be awarded for unanswered questions.
5. Follow the instructions provided during the exam for submitting your answers.

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?

- (A) 25 J
(B) 10 J
(C) 50 J
(D) 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)

- (A) 2 s
(B) 1 s
(C) 3 s
(D) 4 s

3. A 5 Ω resistor and a 10 Ω resistor are connected in parallel. What is the equivalent resistance of the combination?

- (A) 3.33
(B) 15

- (C) 7.5
 - (D) 2
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4. An object of mass 0.5 kg is moving with a velocity of 10 m/s. What is the momentum of the object?

- (A) 5 kg·m/s
 - (B) 10 kg·m/s
 - (C) 50 kg·m/s
 - (D) 0.5 kg·m/s
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5. A metal rod of length $L = 0.8$ m is rotating about its center with an angular velocity $= 10$ rad/s. What is the linear velocity of a point on the rod at a distance $r = 0.4$ m from the center?

- (A) 4 m/s
 - (B) 8 m/s
 - (C) 2 m/s
 - (D) 6 m/s
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6. A 10 C charge is placed in an electric field of 5×10^3 N/C. What is the force experienced by the charge?

- (A) 5×10^2 N
 - (B) 5×10^3 N
 - (C) 5×10^2 N
 - (D) 5×10 N
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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/s²)

- (A) 19.8 m/s
 - (B) 14 m/s
 - (C) 20 m/s
 - (D) 9.8 m/s
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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?

- (A) 1 J
 - (B) 0.5 J
 - (C) 2 J
 - (D) 0.2 J
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9. A car travels at a speed of 72 km/h. What is the car's speed in meters per second?

- (A) 20 m/s
 - (B) 18 m/s
 - (C) 25 m/s
 - (D) 30 m/s
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10. What is the molar mass of sulfur dioxide (SO)?

- (A) 64 g/mol
 - (B) 32 g/mol
 - (C) 48 g/mol
 - (D) 44 g/mol
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11. Which of the following is the correct order of increasing acidity for the following compounds? CHOH, CHCOOH, HCl, and HSO.

- (A) CHOH < CHCOOH < HCl < HSO
 - (B) CHOH < HCl < CHCOOH < HSO
 - (C) HCl < CHOH < CHCOOH < HSO
 - (D) HSO < CHCOOH < HCl < CHOH
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12. What is the pH of a 0.001 M solution of hydrochloric acid (HCl)?

- (A) 3
 - (B) 1
 - (C) 7
 - (D) 4
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13. Which of the following is the correct electron configuration for an oxygen atom?

- (A) $1s^2 2s^2 2p$
 - (B) $1s^2 2s^2 2p$
 - (C) $1s^2 2s^2 2p$
 - (D) $1s^2 2s^2 2p^3$
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14. What is the empirical formula of glucose, whose molecular formula is CHO?

- (A) CHO
 - (B) CHO
 - (C) CHO
 - (D) CHO
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15. How many grams of NaOH are required to neutralize 25 mL of 0.1 M HCl solution?

- (A) 0.25 g
 - (B) 0.5 g
 - (C) 1.0 g
 - (D) 2.0 g
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16. Find the value of x that satisfies the equation $2x + 3 = 11$.

- (A) 4
 - (B) 5
 - (C) 6
 - (D) 7
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17. Find the roots of the quadratic equation $x^2 - 5x + 6 = 0$.

- (A) $x = 2, 3$
 - (B) $x = 1, 6$
 - (C) $x = -2, 3$
 - (D) $x = -1, -6$
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18. Find the value of $\log 32$.

- (A) 5

- (B) 6
 - (C) 4
 - (D) 3
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19. If $\tan \theta = 3/4$, find the value of $\sin \theta$.

- (A) $3/5$
 - (B) $4/5$
 - (C) $3/4$
 - (D) $4/3$
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20. If $f(x) = 3x^2 + 5x - 7$, find $f(2)$.

- (A) 9
 - (B) 15
 - (C) 7
 - (D) 5
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21. Solve for x in the equation $\frac{x+1}{x+3} + \frac{x+2}{x+5} = 1$.

- (A) $x = 1$
 - (B) $x = -1$
 - (C) $x = -4$
 - (D) $x = 3$
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22. Find the area of a triangle with base 12 cm and height 5 cm.

- (A) 30 cm^2
 - (B) 60 cm^2
 - (C) 24 cm^2
 - (D) 15 cm^2
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