



Date :-15/01/2022

Time :-25 Minutes

Exam Name :-MHTCET-
1to1Guru-2

Mark :- 30

1. When 0.2 kcal of heat is supplied to a gas, it expands by 2.1 litres against an external pressure of 10^5 N/m^2 , then calculate increase in internal energy.
(a) 840 J (b) 1050 J (c) 210 J (d) 630 J
2. A metal surface having work function ' w_0 ' emits photoelectrons when photons of energy ' E ' are incident on it. The electron enters the uniform magnetic field
(a) in perpendicular direction and moves in circular path of radius ' r '. Then ' r ' is equal to (m and e be the mass and charge of electron respectively).
(b) $\frac{m(E-w_0)}{eB}$ (c) $\frac{\sqrt{m(E-w_0)}}{eB}$ (d) $\frac{2m(E-w_0)}{eB}$
3. Magnification at least distance of distinct vision of a simple microscope having its focal length 5 cm is
(a) 2 (b) 4 (c) 5 (d) 6
4. Ideal gas for which ' γ ' = 1.5 is suddenly compressed to $\frac{1}{4}$ th of its initial volume. The ratio of the final pressure to the initial pressure is ($\gamma = \frac{C_P}{C_V}$)
[MHT-CET 2020]
(a) 4:1 (b) 8:1 (c) 1:16 (d) 1:8
5. Two conducting circular loops of radii R_1 and R_2 are placed in the same plane with their centres coinciding. If $R_1 > R_2$, the mutual inductance M between them will be directly proportional to
(a) $\frac{R_1}{R_2}$ (b) $\frac{R_2}{R_1}$ (c) $\frac{R_1^2}{R_2}$ (d) $\frac{R_2^2}{R_1}$
6. Two metal spheres of radii R_1 and R_2 are charged to the same potential. The ratio of charges on the spheres is
(a) $\sqrt{R_1} : \sqrt{R_2}$ (b) $R_1 : R_2$ (c) $R_1^2 : R_2^2$ (d) $R_1^3 : R_2^3$
7. An _____ diode offers zero resistance in forward biased mode and infinite resistance in reverse biased mode.
(a) Ideal (b) Forward biased (c) Reverse biased (d) None of these
8. Phenetole react with cold HI gives
(a) $C_6H_5-I + C_2H_5-OH$ (b) $C_2H_5-I + C_6H_5-OH$
(c) $C_6H_5CH_2-OH + C_2H_5-I$
(d) $C_6H_5-OH + CH_3-CH_2-CH_2OH$
9. Which alloy used to prepare antiknocking agent in petrol?
(a) Bronze alloy (b) Na-Pb alloy (c) Li Pb alloy (d) K-Pb alloy
10. Number of gram atoms of an element present in one atom of the element is [MHT-CET 2019]
(a) 1.66×10^{-23} (b) 6.022×10^{23} (c) 1.66×10^{-24} (d) 6.022×10^{22}
11. CH_3CONH_2 , Br_2 and KOH give CH_3NH_2 as the product. The intermediates of the reaction are (A)
 $CH_3-\overset{O}{\parallel}C-NHBr$ B) $CH_3-N=C=O$
(C) $C H_3NHBr$ (D) CH_3CONBr_2
The correct answer is
(a) A, B (b) A, C (c) C, D (d) B, D
12. 0.5 mole of each of H_2 , SO_2 and CH_4 are kept in a container. A hole was made in the container. After 3 h, the order of partial pressures in the container will be
(a) $p_{SO_2} > p_{H_2} > p_{CH_4}$ (b) $p_{SO_2} > p_{CH_4} > p_{H_2}$
(c) $p_{H_2} > p_{SO_2} > p_{CH_4}$ (d) $p_{H_2} > p_{CH_4} > p_{SO_2}$
13. Which of the following ions is coloured in solution ?
(a) Zn^{2+} (b) Ti^{4+} (c) Cu^+ (d) V^{2+}
14. Which of the following reagent form oxime with carbolnyl compounds ?
(a) NH_3OH (b) NH_2OH (c) $NaOH$ (d) CH_2N_2
15. The volume of solid generated by revolving the area bounded by the parabola $x^2 = y$, and the lines $y = 2x$ about X-axis is
(a) $\frac{4\pi}{15}$ cu. units (b) $\frac{16\pi}{15}$ cu. units (c) $\frac{64\pi}{15}$ cu. units
(d) $\frac{256\pi}{15}$ cu. units

16. If $f(x) = \frac{|x-2|}{x-2}$, for $x \neq 2$
 $= 1$, for $x = 2$,
 Then which of the following statements is true? [MHT-CET 2020]

- (a) $\lim_{x \rightarrow 2^+} f(x) = f(2)$
 (b) $f(x)$ is discontinuous at $x = 2$
 (c) $\lim_{x \rightarrow 2^-} f(x) = f(2)$
 (d) $f(x)$ is continuous at $x = 2$

17. The value of $\sin 15^\circ$ is

- (a) $\frac{\sqrt{3}+1}{2\sqrt{2}}$ (b) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (c) $\frac{3+\sqrt{3}}{2\sqrt{2}}$
 (d) None of these

18. The value of $\lim_{x \rightarrow a} \left(\frac{x^2 - (a+1)x + a}{x^2 - a^2} \right)$ is

- (a) $\frac{a+1}{3a^2}$ (b) $\frac{a+1}{a^2}$ (c) $\frac{a-1}{3a^2}$ (d) $\frac{a-1}{a^2}$

19. The means of two samples of sizes 60 and 120 respectively are 35.4 and 30.9 and standard

deviations are 4 and 5. What is the standard deviation of the sample of size 180 obtained by combining the two samples?

- (a) 5.24 (b) 5.26 (c) 5.16 (d) 5.15

20. Degree of the differential equation $\frac{d^3y}{dx^3} + 5 \left(\frac{dy}{dx} \right)^2 = e^{\frac{dy}{dx}}$ is

- (a) 1 (b) 2 (c) 3 (d) None of these

21. How many words can be formed from the letters of the word ARTICLE, if vowels always comes at the odd places?

- (a) 60 (b) 576 (c) $\frac{7!}{3!}$ (d) 120

22. If $\theta = \sin^{-1} x + \cos^{-1} x - \tan^{-1} x$, $x \geq 0$, then the smallest interval in which θ is given by :

- (a) $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{4}$ (b) $0 < \theta < \pi$ (c) $-\frac{\pi}{4} \leq \theta \leq 0$
 (d) $\frac{\pi}{4} \leq \theta \leq \frac{\pi}{2}$