SKD NEW STANDARD COACHING INSTITUTE
39 GLORIOUS YEARS OF EXCELLENCE IN TEACHING
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MM : 120 **Class-XI JEE** **TIME : 60 MINUTES**

NOTE: There are three sections, Physics, Chemistry and Maths.
Each section carries 10 questions with four marks each and all are compulsory.

PHYSICS

01. The number of significant figures in 0.06900 is
(1) 5 (2) 4
(3) 2 (4) 3

02. The slope of the velocity- time graph for retarded motion is
(1) positive
(2) negative
(3) zero
(4) can be positive, negative or zero

03. Three different objects of mass $m^1 : m^2 : m^3$ are allowed to fall from rest and from the same point O along three different frictionless path. The speed of the three objects on reaching the ground will be in the ratio of
(1) $m_1 : m_2 : m_3$ (2) $m_1 : 2m_2 : 3m_3$
(3) 1 : 1 : 1 (4) $\frac{1}{m_1} : \frac{1}{m_2} : \frac{1}{m_3}$

04. What is the angle between $\hat{i} + \hat{j} + \hat{k}$ and $\hat{j}$?
(1) 0 (2) 45°
(3) 60° (4) None of these

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05. During a projectile motion if the maximum height equals the horizontal range, then the angle of projetcion with the horizontal is
(1) $\tan^{-1}(1)$ (2) $\tan^{-1}(2)$
(3) $\tan^{-1}(3)$ (4) $\tan^{-1}(4)$

06. A block of weight 4 kg is resting on a smooth horizontal plane. If it is struck by a jet of water at the rate of 2 kg s^{-1} and at the speed of 10 m s^{-1}, then the initial acceleration of the block is
(1) 15 ms^{-2} (2) 10 m s^{-2}
(3) 2.5 ms^{-2} (4) 5 ms^{-2}

07. A car of mass m is moving up through a frictionless platform inclined at angle θ. The acceleration of the car is
(1) mg sin θ (2) mg cos θ
(3) gsin θ (4) g cos θ

08. A ball whose kinetic energy is E, is projected at an angle of 30° to the horizontal. AT the highest point of its flight, the kinetic energy of the ball is
(1) E/2 (2) E
(3) 3E/2 (4) zero

09. The kinetic energy of a body of mass 4 kg and momentum of 6 N s will be
(1) 3.5 J (2) 5.5 J
(3) 2.5 J (4) 4.5 J

ROUGH WORK

10. Choose the correct expression for power.

(1) $\vec{F}.\vec{v}$ (2) $\frac{1}{2}\vec{F}.\vec{v}^2$

(3) $\vec{F}.\vec{t}$ (4) $\vec{F}\times\vec{v}$

CHEMISTRY

11. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be

(1) 3 mol (2) 4 mol

(2) 1 mol (4) 2 mol

12. The electronic configuration of Cu (atomic number 29) is

(1) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^9$

(2) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^1$

(3) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4p^6\ 5s^2\ 5p^1$

(4) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4p^6\ 3d^{10}$

13. The number of spherical nodes in 3*p* orbitals is/are

(1) one (2) three

(3) none (4) two

14. Which of the following orders of ionic radii is correctly represented?

(1) $H^- > H > H^+$ (2) $Na^+ > F^- > O^{2-}$

(3) $F^- > O^{2-} > Na^+$ (4) $Al^{3+} > Mg^{2+} > N^{3-}$

15. The correct geometry and hybridization for XeF_4 are

(1) octahedral, $sp^3\ d^2$

(2) trigonal bipyramidal, $sp^3\ d$

(3) planar triangle, $sp^3\ d^3$

(4) square planar, $sp^3\ d^2$.

16. Decreasing order of stability of O_2, O_2^-, O_2^+ and O_2^{2-} is

(1) $O_2^{2-} > O_2^- > O_2 > O_2^+$

(2) $O_2 > O_2^+ > O_2^{2-} > O_2^-$

(3) $O_2^- > O_2^{2-} > O_2^+ > O_2$

(4) $O_2^+ > O_2 > O_2^- > O_2^{2-}$

17. If the bond energies of H-H, Br-Br and H-Br are 433,192, and 364 kJ mol^{-1} respectively, the $\Delta H°$ for the reaction

$H_{2(g)} + Br_{2(g)} \rightarrow 2HBr_{(g)}$ is

(1) -261 kJ (2) +103 kJ

(3) +261 kJ (4) -103 kJ

18. A gas is allowed to expand in a well insulated container against a constant external pressure of 2.5 atm from an initial volume of 2.50 L to a final volume of 4.50L. The change in internal energy ΔU of the gas in joule will be

(1) -500 J (2) -505 J

(3) +505 J (4) 1136.25 J

19. Conjugate acid of NH_2^- is

(1) NH_4OH (2) NH_4^+

(3) NH_2^- (4) NH_3

20. For the reaction, $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$, the equilibrium constant is K_1. The equilibrium constant is K_2 for the reaction, $2NO_{(g)} + O_{2(g)} \rightleftharpoons 2NO_{2(g)}$ What is K for the reaction, $NO_{2(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$?

(1) $\frac{1}{2K_1K_2}$ (2) $\frac{1}{4K_1K_2}$

(3) $\left[\frac{1}{K_1K_2}\right]^{1/2}$ (4) $\frac{1}{K_1K_2}$

ROUGH WORK

MATHS

21. Domain of $f(x)=\sqrt{4x-x^2}$ *is*

(1) R - [0, 4] (2) R - (0, 4)
(3) (0, 4) (4) [0, 4]

22. A relation R is defined from {2,3,4,5} to {3,6,7,10} by xRy $\Leftrightarrow$ x is relatively prime to y. Then, domain of R is

(1) {2,3,4} (2) {3,5}
(3) {2,3,4} (4) {2,3,4,5}

23. The value of tan3A - tan2A - tanA is equal to

(1) tan3A tan2A tanA
(2) -tan3A tan2A tanA
(3) tanA tan2A -tan2A tan 3A - tan3A tanA
(4) None of these

24. Let A and B be acute angles such that $\sin A = \sin^2 B$ and $2\cos^2 A = 3\cos^2 B$. Then A is equal to

(1) $\frac{\pi}{4}$ (2) $\frac{\pi}{6}$

(3) $\frac{\pi}{3}$ (4) $\frac{\pi}{2}$

25. If z = x + iy lies in the third quadrant, then $\frac{\bar{z}}{z}$ also lies in the third quadrant if

(1) x > y > 0 (2) x < y < 0
(3) y < x < 0 (4) y > x > 0

26. Simplify $i^{n+100}+i^{n+50}+i^{n+48}+i^{n+46}$

(1) 0 (2) 1
(3) 2 (4) 4

27. If $3 \le 3t-18 \le 18$, then which one of the following is true?

(1) $15 \le 2t+1 \le 20$ (2) $8 \le t < 20$
(3) $8 \le t+1 \le 13$ (4) $21 \le 3t \le 24$

28. Solve the inequality $2x-5 \le \frac{(4x-7)}{3}$

(1) $x \in (-\infty, 4)$ (2) $x \in (-\infty, 4]$
(3) $x \in (-\infty, 8]$ (4) $x \in (-\infty, -4)$

29. The sum of the digits in the unit's place of all the numbers formed with the help of 3,4,5 and 6 taken all at a time is

(1) 432 (2) 108
(3) 36 (4) 18

30. The number of positive integers less than 40,000 that can be formed by using all the digits 1,2,3,4 and 5 is equal to

(1) 24 (2) 78
(3) 32 (4) 72

ROUGH WORK