



Sample Paper

For Class - XI (PCM)

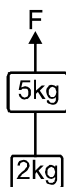
Time: 90 Min.		TEST PATTERN		Max. Marks: 135	
Total Questions	Subject		Type	Marks Criteria (Total 135 Marks)	
45	Physics (1-15), Chemistry (16-30), Mathematics (31-45)		Objective Question	Correct (+3) Mark	Incorrect (−1) Mark

1. PHYSICS

Straight Objective

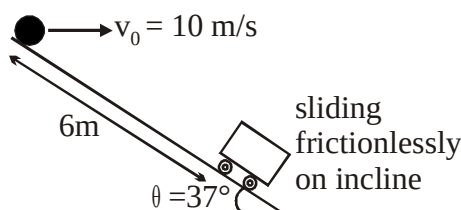
This section contains 15 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

- The work done by the external forces on a system equals the change in
(A) Total energy (B) Kinetic energy (C) Potential energy (D) None of these
- A solid floats in a liquid in a partially dipped position. Select the **incorrect** option
(A) The solid exerts a force equal to its weight on the liquid.
(B) The liquid exerts a force of buoyancy on the solid which is equal to the weight of the solid.
(C) The weight of the displaced liquid equals the weight of the solid.
(D) The weight of the dipped part of the solid is equal to the weight of the displaced liquid.
- Let E, G and N represent the magnitudes of electromagnetic, gravitational and nuclear forces between two electrons at a given separation. Then
(A) $N > E > G$ (B) $E > N > G$ (C) $G > N > E$ (D) $E > G > N$
- For a given angle of projection of a projectile if speed of projection is doubled, then the range of the projectile becomes.
(A) Half (B) One-fourth (C) Two times (D) Four times
- Two equal masses are attached to the two ends of a spring of spring constant k. The masses are pulled out symmetrically to stretch the spring by a length x over its natural length. The work done by the spring on each mass is
(A) $\frac{1}{2} kx^2$ (B) $-\frac{1}{2} kx^2$ (C) $\frac{1}{4} kx^2$ (D) $-\frac{1}{4} kx^2$
- The negative of the work done by the conservative internal forces on a system equals the change in
(A) Total energy (B) Kinetic energy (C) Potential energy (D) None of these
- From the top of a tower, a ball is thrown vertically upward which reaches the ground in 6 s. A second ball thrown vertically downward from the same position with the same speed reaches the ground in 1.5 s. A third ball released, from the rest from the same location, will reach the ground in _____ s.
(A) 3 (B) 1 (C) 4 (D) 5
- The slope of the curve $y = x^3 - 2x + 1$ at point $x = 1$ is equal to :
(A) 0 (B) 1 (C) 2 (D) 3
- As shown in the figure two blocks are connected by a massless string. Maximum tension which the string connecting the two masses can bear is 30 N then maximum value of F for which system can move in vertically upward direction without breaking of string is : ($g = 10 \text{ m/s}^2$)



- (A) 90 N (B) 95 N (C) 100 N (D) 105 N
- A road is banked at an angle of 30° to the horizontal for negotiating a curve of radius $10\sqrt{3}$ m. At what velocity will a car experience no friction while negotiating the curve? Take $g = 10 \text{ ms}^{-1}$.
(A) 54 km/hr (B) 72 km/hr (C) 36 km/hr (D) 18 km/hr
 - Rain is falling with velocity $4\hat{i} - 3\hat{j}$ m/sec. A person starts moving with acceleration $1\hat{i}$ m/sec² on a horizontal road. The difference between two time instants in seconds at which the rain appears to fall at 45° with vertical to the person is : (x is horizontal and y is vertically upward direction)
(A) 6 sec (B) 12 sec (C) 8 sec (D) 4 sec

12. An object of mass 10 kg is connected to the lower end of a massless string of length 4m hanging from the ceiling. If a force F is applied horizontally at the mid-point of the string, such that the top half of the string makes an angle of 45° with the vertical in equilibrium, then the magnitude of F is
 (A) 75 N (B) 90 N (C) 100 N (D) 70 N
13. The angular velocity of a particle is $\vec{\omega} = 4\hat{i} + \hat{j} - 2\hat{k}$ about the origin. If the position vector of the particle is $2\hat{i} + 3\hat{j} - 3\hat{k}$, then its linear velocity is
 (A) $5\hat{i} + 8\hat{j} - 14\hat{k}$ (B) $3\hat{i} + 8\hat{j} + 10\hat{k}$ (C) $8\hat{i} + 3\hat{j} - 10\hat{k}$ (D) $-8\hat{i} + 3\hat{j} - 2\hat{k}$
14. A ball of mass m moving with velocity 20 m/s strikes the bob of a pendulum at rest. The mass of the bob is also m . If the ball sticks to bob, then the height (in m) to which the bob will rise is. ($g = 10 \text{ m/s}^2$).
 (A) 5 (B) 3 (C) 2 (D) None of these
15. A ball is projected horizontally from an incline plane so as to strike a cart which is sliding down the smooth incline. The height of cart and size of the ball are small. At the instance the ball is thrown, the speed of cart is ' v ' (in m/s). Find ' v ' so that the ball strikes the cart. ($g = 10 \text{ m/s}^2$)



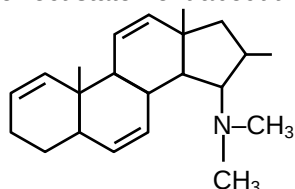
- (A) 6 (B) 4 (C) 8 (D) None of these

2. CHEMISTRY

Straight Objective Type

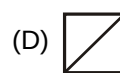
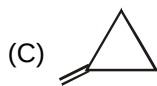
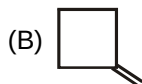
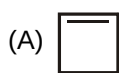
This section contains 15 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

16. The maximum volume at NTP is occupied by :
 (A) 12.8 g of SO_2 (B) 6.02×10^{22} molecules of CH_4 (C) 0.5 mol of NO_2 (D) 1 mol CO_2
17. If the mass number of an element is 23 times that of the lightest element and it has 11 protons, then it contains :
 (A) 11 protons, 23 neutrons, 11 electrons (B) 11 protons, 11 neutrons, 11 electrons
 (C) 11 protons, 12 neutrons, 11 electrons (D) 11 protons, 11 neutrons, 23 electrons
18. Calculate total number of atoms in 115 g of sodium.
 (A) 5 (B) 3 (C) $5 N_A$ (D) $7 N_A$
19. The incorrect statement about the following compound is :

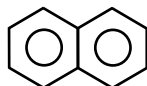


- (A) Number of sp^2 C-atoms is 6 (B) Number of allylic hydrogens is 4
 (C) 3° -Amine functional group is present. (D) It is a homocyclic compound.
20. Which of the following statements is incorrect?
 (A) Neopentane contains a 4° C-atom.
 (B) Isobutane contains a 3° C-atom.
 (C) Isooctane contains four 2° carbon atoms
 (D) Groups obtained by removal of one H-atom from the alkane are called alkyl group.

21. Which of the following is impossible structure for the molecular formula C_4H_6 ?



22. Find out **incorrect** statement about given molecule



- (A) Compound is homocyclic aromatic.
(B) Compound's name is anthracene
(C) Number of π bonded carbon atoms are 10.
(D) Degree of unsaturation (DU) or double bond equivalent (DBE) is seven.

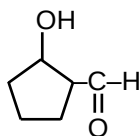
23. Radius of IInd Bohr orbit of He^+ is r then radius of IIIrd Bohr orbit of He^+ is :

- (A) $2r$ (B) $9r$ (C) $\frac{4}{9}r$ (D) $\frac{9}{4}r$

24. As we go away from the nucleus, the difference between the successive energy levels -

- (A) increases (D) decreases
(C) remains constant (D) first increases, then decreases

25. IUPAC name of :



- (A) 2-Formyl cyclopentane-1-ol (B) 2-Hydroxycyclopentanecarbaldehyde
(C) 1-Hydroxy-2-formylcyclopentane (D) 2-Hydroxycyclopentanal

26. Aluminum is usually found in +3 oxidation state. In contrast, thallium exists in +1 and +3 oxidation states. This is due to :

- (A) inert pair effect (B) lanthanoid contraction
(C) diagonal relationship (D) lattice effect

27. 5.6 L of a gaseous alkane at STP, one molecule of which contains 6 H-atoms, is allowed to burn in presence of 80 g air (containing 20% oxygen gas by mass). The maximum mass of CO_2 that can be produced is :

- (A) 22 g (B) 12.57 g (C) 1.257 g (D) None of these

28. The percentage of As in peroxidase anhydrous enzyme is 0.5% by weight (atomic weight = 75). Then minimum molecular weight of peroxidase anhydrous enzyme is :

- (A) 15 kg (B) 75 kg (C) 7.5 kg (D) none

29. When 44.8 litres of $H_2(g)$ is mixed with 22.4 litres of $Cl_2(g)$, each at STP, the moles of $HCl(g)$ formed is equal to -

- (A) 1 mol of $HCl(g)$ (B) 2 mol of $HCl(g)$ (C) 0.5 mol of $HCl(g)$ (D) 1.5 mol of $HCl(g)$

30. Find the relative density of SO_3 gas with respect to methane :

- (A) 8 (B) 3.5 (C) 2.5 (D) 5

3. MATHEMATICS

Straight Objective Type

This section contains 15 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

31. If $\tan \theta = -\frac{4}{3}$, then $\sin \theta$ is
(A) $-\frac{4}{5}$ but not $\frac{4}{5}$ (B) $-\frac{4}{5}$ or $\frac{4}{5}$ (C) $\frac{4}{5}$ but not $-\frac{4}{5}$ (D) None of the above
32. If $A = \{1, 3, 5, 6, 9, 11, 13, 15, 17\}$, $B = \{2, 4, \dots, 18\}$ and N is the universal set then $A' \cup \{(A \cup B) \cap B'\}$ is
(A) A (B) N (C) B (D) None of these
33. If an AP is given by 3, $a_2, \dots, 20$, then which of the following is the sum of second and second last terms?
(A) 20 (B) 3 (C) 23 (D) 22
34. The harmonic mean of the roots of the equation $(5 + \sqrt{2})x^2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$ is
(A) 2 (B) 4 (C) 6 (D) 8
35. What is the minimum height of any point on curve $y = x^2 - 4x + 6$ above the X-axis
(A) 2 (B) 3 (C) 1 (D) None of these
36. If $x^2 + 6x - 27 > 0$ and $x^2 - 3x - 4 < 0$, then
(A) $x > 3$ (B) $x < 4$ (C) $3 < x < 4$ (D) $x = \frac{7}{2}$
37. $x^4 - 4x - 1 = 0$
(A) All real roots (B) All imaginary roots (C) Exactly two real roots (D) None of these
38. If $\sin A = \frac{1}{\sqrt{10}}$ and $\sin B = \frac{1}{\sqrt{5}}$, where A, B are acute angles, then $A + B$ equals
(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{2}$ (C) $\frac{\pi}{3}$ (D) π
39. If $\sin A + \cos A = \sqrt{2}$, then the value of $\cos^2$ is
(A) $\sqrt{2}$ (B) $1/2$ (C) 4 (D) -1
40. If $\tan x = \frac{3}{4}$, $\pi < x < \frac{3\pi}{2}$, then the value of $\cos \frac{x}{2}$ is
(A) $-\frac{1}{\sqrt{10}}$ (B) $\frac{3}{\sqrt{10}}$ (C) $\frac{1}{\sqrt{10}}$ (D) $-\frac{3}{\sqrt{10}}$
41. The least value of $3 \sin^2 \theta + 4 \cos^2 \theta$ is
(A) 2 (B) 3 (C) 0 (D) 1
42. The number of solutions of $\cos 2\theta = \sin \theta$ in $(0, 2\pi)$ is
(A) 1 (B) 2 (C) 3 (D) 4
43. The value of a for which the equation $2x^2 + 2\sqrt{6}x + a = 0$ has equal roots, is
(A) 3 (B) 4 (C) 2 (D) $\sqrt{3}$
44. If one root of the equation $x^2 + px + q = 0$ is $2 + \sqrt{3}$, then the value of p and q are, respectively
(A) $-4, 1$ (B) $4, -1$ (C) $2, \sqrt{3}$ (D) $-2, -\sqrt{3}$
45. If the sum of first n terms of an AP 2, 4, 6, is 240, then the value of n is
(A) 14 (B) 15 (C) 16 (D) 17

CLASS : XI_PCM**STAR SAMPLE PAPER****ANSWER KEY**

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	A	D	D	D	D	C	A	B	D	C	A	C	B	A	B
Ques.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	D	C	C	B	C	B	B	D	D	B	A	B	A	B	D
Ques.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	B	B	C	B	A	C	C	A	A	A	B	C	A	A	B