PAPER-2 | CLASS XI | COURSE : ALL INDIA TEST SERIES (...

Date : 12-11-2017 **Time: 3 Hours** **Maximum Marks : 252**

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

GENERAL :

1. The sealed booklet is your Question Paper. Do not break the seal till you are instructed to do so.
2. The question paper CODE is printed on the right hand top corner of this sheet.
3. Use the Optical Response Sheet (ORS) provided separately for answering the question.
4. Blank spaces are provided within this booklet for rough work.
5. Write your Name and Roll Number in the space provided on the below cover.
6. After the open booklet, verify that the booklet contains all the **54** questions along with the options are legible.

QUESTION PAPER FORMAT AND MARKING SCHEME :

7. The question paper has three parts : **Mathematics, Physics and Chemistry.** Each part has two sections.
8. Each section as detailed in the following table :

Section	Question Type	Number of Questions	Category-wise Marks for Each Question				Maximum Marks of the Section
			Full Marks	Partial Marks	Zero Marks	Negative Marks	
1	One or More Correct Option(s)	15	+4 If only the bubble(s) corresponding to all the correct option(s) is(are) darkened	+1 For darkening a bubble corresponding to each correct option, provided NO incorrect option is darkened	0 If none of the bubbles is darkened	–2 In all other cases	60
2	Match the Column	3	For each entry in Column-I +2 If only the bubble(s) corresponding to all the correct match(es) is(are) darkened	–	0 if not attempted	–1 In all other cases	24

OPTICAL RESPONSE SHEET :

9. Darken the appropriate bubbles on the original by applying sufficient pressure.
10. The original is machine-gradable and will be collected by the invigilator at the end of the examination.
11. Do not tamper with or mutilate the ORS.
12. Write your name, roll number and the name of the examination centre and sign with pen in the space provided for this purpose on the original. **Do not write any of these details anywhere else.** Darken the appropriate bubble under each digit of your roll number.

DARKENING THE BUBBLES ON THE ORS :

13. Use a **BLACK BALL POINT** to darken the bubbles in the upper sheet.
14. Darken the bubble **COMPLETELY.**
15. Darken the bubble **ONLY** if you are sure of the answer.
16. The correct way of darkening a bubble is as shown here : ●
17. There is **NO** way to erase or "un-darkened bubble.
18. The marking scheme given at the beginning of each section gives details of how darkened and **not darkened** bubbles are evaluated.

DO NOT BREAK THE SEALS WITHOUT BEING INSTRUCTED TO DO SO BY THE INVIGILATOR

NAME OF THE CANDIDATE : .....

ROLL NO. : .....

I have read all the instructions and shall abide by them

I have verified the identity, name and roll number of the candidate.

Signature of the Candidate

Signature of the Invigilator

SECTION – 1 : (Maximum Marks : 60)

- This section contains **FIFTEEN** questions
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct
- For each question, darken the bubble(s) corresponding to all the correct option(s) in the ORS
- For each question, marks will be awarded in one of the following categories :

Full Marks	:	+4	If only the bubble(s) corresponding to all the correct option(s) is(are) darkened.
Partial Marks	:	+1	For darkening a bubble corresponding to **each correct option,** provided NO incorrect option is darkened.
Zero Marks	:	0	If none of the bubbles is darkened.
Negative Marks	:	–2	In all other cases.

- For example, if (A), (C) and (D) are all the correct options for a question, darkening all these three will result in +4 marks ; darkening only (A) and (D) will result in +2 marks and darkening (A) and (B) will result in –2 marks, as a wrong option is also darkened.

1. Let $n = 3^{100}$, then for n

(A) unit digit is 1 (B) ten's digit is 0 (C) unit digit is 7 (D) ten digit is 2

2. A solution of the equation $(1 - \tan\theta)(1 + \tan\theta)\sec^2\theta + 2^{\tan^2\theta} = 0$ where θ lies in the interval $\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$ is given by

(A) $\theta = 0$ (B) $\theta = \frac{\pi}{3}$ (C) $\theta = \frac{-\pi}{3}$ (D) $\theta = \frac{\pi}{6}$

Space for Rough Work

MATHEMATICS

3. If the equations $x^2 + bx + c = 0$ and $bx^2 + cx + 1 = 0$ have a common root then which one can be true

(A) $b + c + 1 = 0$ (B) $b + c + 1 = bc$

(C) $b^2 + c^2 + 1 = bc$ (D) $(b - c)^2 + (b - 1)^2 + (c - 1)^2 = 0$

4. Let α, β be the roots of $ax^2 + 2bx + c = 0$ and γ, δ be the roots of $px^2 + 2qx + r = 0$ then which one may be correct

(A) if $\alpha, \beta, \gamma, \delta$ are in A.P. then $\frac{b^2 - ac}{a^2} = \frac{q^2 - pr}{p^2}$

(B) if $\alpha, \beta, \gamma, \delta$ are in G.P. then $\frac{b^2}{ac} = \frac{q^2}{pr}$

(C) if $\alpha, \beta, \gamma, \delta$ are in H.P. then $\frac{b^2 - ac}{c^2} = \frac{q^2 - pr}{r^2}$

(D) if $\alpha, \beta, \gamma, \delta$ are in G.P. then $\frac{b^2}{b^2 - ac} = \frac{q^2}{q^2 - pr}$

5. If the equation $ax^2 + bx + c = 0$ $(a > 0)$ has two roots α & β such that $\alpha < -1$ and $\beta > 1$ then

(A) $a + 2|b| + 4c < 0$ (B) $b^2 - 4ac > 0$

(C) $c > 0$ (D) $c < 0$

Space for Rough Work

6. The numbers 1, 2, 8 can be three terms (not necessarily consecutive) of

(A) at least one A.P. (B) at least one G.P.

(C) infinite A.P's (D) infinite G.P's

7. Let $s_n = (1)(5) + (2)(5)^2 + (3)(5)^3 + \ldots\ldots + n(5)^n = \frac{1}{16}[(4n-1)5^a + b]$ then

(A) a = n (B) a = n + 1

(C) b = 5 (D) b = 25

8. If $[\log_5 x] = 2$, then x may lie in (where [.] denotes greatest integer function)

(A) $x \in [25, 125)$ (B) $x \in [20, 100)$

(C) $x \in [25, 40]$ (D) $x \in [25, 125]$

9. Values of x satisfying the equation $x^{\log_5 x^2 + (\log_5 x)^2 - 12} = \frac{1}{x^4}$

(A) 1 (B) 25

(C) $\frac{1}{25}$ (D) $\frac{1}{625}$

10. In the expansion of $(a + b + c)^{10}$

(A) total number of distinct terms is 66 (B) coefficient of $a^6 b c$ is 90

(C) coefficient of $a^4 b^5 c^3$ is 0 (D) coefficient of $a^4 b^5 c$ is 5

11. If the third term in the expansion of $\left(\left(\frac{1}{x}\right) + x^{\log_{10} x}\right)^5$ is 1000, then x is equal to

(A) 100 (B) 10

(C) 1 (D) $\frac{1}{\sqrt{10}}$

12. $\left(\frac{1+\sin\theta-\cos\theta}{1+\sin\theta+\cos\theta}\right)^2$ is equal to

(A) $\frac{1-\cos\theta}{1+\cos\theta}$ (B) $\frac{1-\sin\theta}{1+\sin\theta}$

(C) $\tan^2\frac{\theta}{2}$ (D) $\cot^2\frac{\theta}{2}$

13. The value of $\tan^2\alpha - \tan^2\beta - \frac{1}{2}\sin(\alpha-\beta)\sec^2\alpha\sec^2\beta$ is zero if

(A) $\sin(\alpha+\beta) = 0$

(B) $\sin(\alpha+\beta) = \frac{1}{2}$

(C) $\sin(\alpha-\beta) = 0$

(D) $\sin(\alpha-\beta) = \frac{1}{2}$

14. If in a triangle ABC, a, b, c are in A.P. and p_1, p_2, p_3 are the altitudes from the vertices A, B, C respectively then

(A) sinA, sinB, sinC are in A.P.

(B) sinA, sinB, sinC are in H.P.

(C) $p_1 + p_2 + p_3 \le \frac{3R}{\Delta}$

(D) $\frac{1}{p_1} + \frac{1}{p_2} + \frac{1}{p_3} \le \frac{3R}{\Delta}$

15. Number of solution of the equation $|x-2| + |x-3| + |x-4| = k$ is

(A) zero if $k < 2$

(B) infinite if $k > 2$

(C) two if $k \ge 2$

(D) two if $k > 2$

Space for Rough Work

SECTION – 2 : (Maximum Marks : 24)

This section contains **THREE** questions

Each question contains two columns, **Column I** and **Column II**

Column I has **four** entries (A),(B), (C) and (D)

Column II has **five** entries (P),(Q), (R), (S) and (T)

Match the entries in **Column I** with the entries in **Column II**

One or more entries in **Column I** may match with one or more entries in **Column II**

The ORS contains a 4 × 5 matrix whose layout will be similar to the one shown below :

(A)	(P)	(Q)	(R)	(S)	(T)
(B)	(P)	(Q)	(R)	(S)	(T)
(C)	(P)	(Q)	(R)	(S)	(T)
(D)	(P)	(Q)	(R)	(S)	(T)

For each entry in **Column I**, darken the bubbles of all the matching entries. For example, if entry (A) in **Column I** matches with entries (Q), (R) and (T), then darken these three bubbles in the ORS. Similarly, for entries (B), (C) and (D).

Marking scheme :

For each entry in **Column I**

+2 If only the bubble(s) corresponding to all the correct match(es) is (are) darkened

0 If none of the bubbles is darkened

–1 In all other cases

Space for Rough Work

16. *In a triangle ABC*

Column-I	Column-II
(A) $b\cos C + c\cos B$	(P) a
(B) $b^2 + c^2 - 2bc\cos A$	(Q) 1
(C) $bc\sin A$	(R) $(a + b + c)r$
(D) $b\sin A - a\sin B$	(S) a^2
	(T) 0

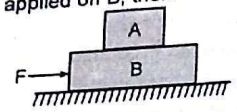
17. *Number of solution of the equation*

Column-I	Column-II
(A) $\sin^2 x - \cos x = \frac{1}{4}$; $x \in [0, 2\pi]$	(P) infinite
(B) $[x - 1] = x^2 - 4x + 3$; $[.]$ is G.I. F.	(Q) 1
(C) $\sin^4 2x + \cos^4 2x + 3\sin^2 x \cos^2 x = 0$	(R) 2
(D) $\lvert x - 2\rvert = \lvert x - 4\rvert$	(S) 0
	(T) more than one

Let $a_n = \frac{1}{n}\ \forall\ n \geq 1$ and [x] denotes the greatest integer less than or equal to x.

Column-I	Column-II
(A) $\left[\frac{1}{50} + a_1\right] + \left[\frac{1}{50} + a_2\right] + \ldots\ldots + \left[\frac{1}{50} + a_{101}\right]$	(P) 0
(B) $[a_1 + a_{100}] + [a_2 + a_{99}] + \ldots\ldots + [a_{100} + a_1]$	(Q) 1
(C) $[a_1 + a_2 + \ldots\ldots + a_{11}]$	(R) 2
(D) $[a_1 + a_2 + \ldots\ldots + a_{11} - 2]$	(S) 3
	(T) 4

23. A block A of mass 2 kg rests on another block B of mass 5 kg as shown in figure. The co-efficient of friction between A and B is 0.25 and that between block B and the floor is 0.5. When a horizontal force of F = 50 N is applied on B, then:



(A) Both the blocks will move with common accleration of $\frac{15}{7}m/s^2$

(B) Friction force between the blocks is 5N

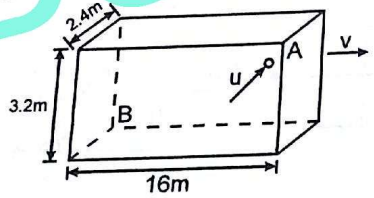
(C) Friction force between the blocks is $\frac{30}{7}N$

(D) Total work done by frictions between the blocks of system in initial 5 seconds is zero

24. A square plate lies in x-y plane with its edges parallel to x and y-axis and origin is at the centre of the plate. Its moment of inertia about x,y & z axes are I_x , I_y and I_z respectively and about a diagonal it is I_D. Then

(A) $I_x = I_y = \frac{I_z}{2}$ (B) $I_D = I_x$ (C) $I_x = I_y = 2I_z$ (D) $I_D = I_z$

25. A railway compartment is 16 m long, 2.4 m wide and 3.2 m high. It is moving with a velocity υ. A particle moving horizontally with a speed u, perpendicular to the direction of υ enters through a hole at an upper corner A and strikes the diagonally opposite corner B. Assume g = 10 m/s².



(A) υ = 20 m/s

(B) u = 3 m/s

(C) to an observer inside the compartment the path of the particle is a parabola

(D) to a stationary observer outside the compartment the path of the particle is a parabola

A ballon, which is initally at rest, starts rising with an acceleration of 1.25 m/s² after 8 seconds. A stone is released from the balloon. Then :

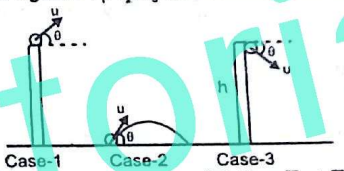
(A) Speed of the stone just after releasing is 10 m/s

(B) Acceleration of the stone just after releasing is 1.25 m/s²

(C) Magnitude of acceleration of the stone just after releasing is 10 m/s²

(D) The stone will reach the ground 4 seconds after releasing.

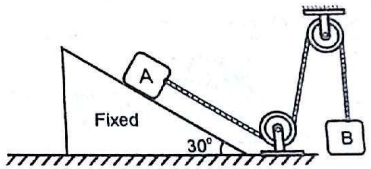
In given three cases, times of flight is T_1, T_2, T_3 respectively then choose correct relations :



(A) $T_1 = T_2 + T_3$ (B) $T_2 = T_1 + T_3$

(C) $T_1 > T_2$ (D) $T_1 > T_3$

Two blocks A and B of equal mass m are connected through a massless string and arranged as shown in figure. The wedge is fixed on horizontal surface. Friction is absent everywhere. When the system is released from rest.

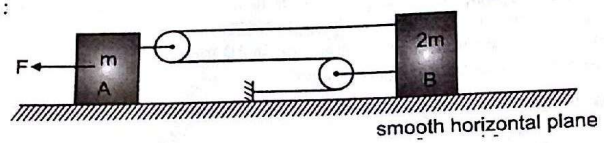


(A) tension in string is $\frac{mg}{2}$ (B) tension in string is $\frac{mg}{4}$

(C) acceleration of A is g/2 (D) acceleration of A is $\frac{3}{4}g$

Space for Rough Work

29. An external horizontal force 'F' is applied to a system of two blocks placed on a smooth surface as shown :



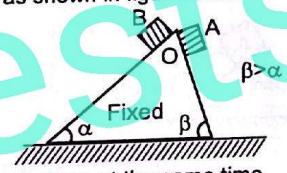
(A) Acceleration of block A is $\frac{9F}{17m}$

(B) Acceleration of block A is $\frac{9F}{20m}$

(C) Acceleration of block B is $\frac{6F}{17m}$

(D) Relative acceleration of block A with respect to B is $\frac{15F}{17m}$

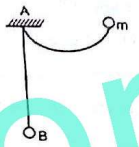
30. Two inclined frictionless tracks of different inclinations meet at O from where two blocks A and B of different masses are released as shown in figure. Then :



(A) Both blocks will reaches the bottom at the same time
(B) Block A will reach the bottom earlier than block B
(C) Both blocks will reach the bottom with same speed
(D) Block B will reach the bottom with a higher speed than block A

Space for Rough Work

31. A ball of mass m = 200 gm is suspended from a point A by an inextensible string of length L. Ball is drawn to a side and held at same level as A but at a distance $\frac{\sqrt{3}}{2}$L from A as shown. Now the ball is released. Then : (assume string applies only that much jerk which is required so that velocity along string becomes zero).



(A) speed of ball just before experiencing jerk is $\sqrt{gL}$

(B) speed of ball just after experiencing jerk is $\frac{\sqrt{3gL}}{2}$

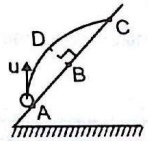
(C) Impulse applied by string $\frac{\sqrt{gL}}{10}$

(D) ball will experience jerk after reaching to point B.

32. A particle is thrown at t = 0, with an initial velocity $\sqrt{11}\hat{i}+35\hat{j}$, where $\hat{i}$ is along horizontal & $\hat{j}$ is along vertically upward direction. The acceleration due to gravity is 10 m/s² in vertically downward direction. The time instant(s) at which the speed of the particle becomes 6 m/s is/are

(A) 3 sec (B) 2 sec (C) 5 sec (D) 4 sec

33. A projectile is projected on an inclined plane as shown in figure. 'D' is a point of maximum height from inclined plane then :



(A) AB = BC (B) AB > BC
(C) BC > AB (D) time from A to D is equal to D to C

Space for Rough Work

SECTION – 2 : (Maximum Marks : 24)

- This section contains **THREE** questions
- Each question contains two columns, **Column I** and **Column II**
- **Column I** has **four** entries (A),(B), (C) and (D)
- **Column II** has **five** entries (P),(Q), (R), (S) and (T)
- Match the entries in **Column I** with the entries in **Column II**
- One or more entries in **Column I** may match with one or more entries in **Column II**
- The ORS contains a 4 × 5 matrix whose layout will be similar to the one shown below :

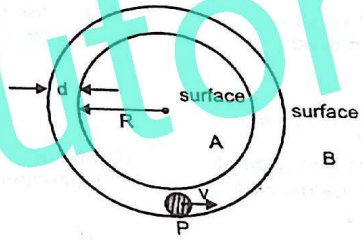
(A) (P) (Q) (R) (S) (T)
(B) (P) (Q) (R) (S) (T)
(C) (P) (Q) (R) (S) (T)
(D) (P) (Q) (R) (S) (T)

- For each entry in **Column I**, darken the bubbles of all the matching entries. For example, if entry (A) in **Column I** matches with entries (Q), (R) and (T), then darken these three bubbles in the ORS. Similarly, for entries (B), (C) and (D).
- Marking scheme :

<u>For each entry in **Column I**</u>

+2 If only the bubble(s) corresponding to all the correct match(es) is (are) darkened
0 If none of the bubbles is darkened
–1 In all other cases

A small spherical ball of mass m is projected from lowest point (point P) in the space between two fixed, concentric spheres A and B (see figure). The smaller sphere A has a radius R and the space between the two spheres has a width d. The ball has a diameter very slightly less than d. All surfaces are frictionless. Speed of ball at lowest point is v. N_A and N_B represent magnitudes of the normal reaction force on the ball exerted by the spheres A and B respectively. Match the value of v given in column–I with corresponding results in column–II.



Column–I

(A) $v = \sqrt{gR}$
(B) $v = \sqrt{2gR}$
(C) $v = \sqrt{3gR}$
(D) $v = \sqrt{5gR}$

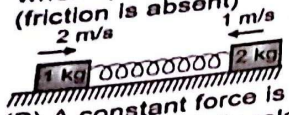
Column–II

(P) maximum value of $N_A = 0$
(Q) minimum value of $N_B = 0$
(R) maximum value of $N_B = 6$ mg
(S) maximum value of $N_B = 4$ mg
(T) maximum value of $N_B = 2$ mg

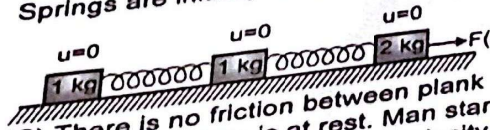
35. **Match the column:**
In all cases in column–I, the blocks are placed on the smooth horizontal surface.

Column–I

(A) The initial velocities given to the blocks when spring is relaxed are as shown (friction is absent)



(B) A constant force is applied on 2 kg block. Springs are initially relaxed & friction is absent



(C) There is no friction between plank and ground and initially system is at rest. Man starts moving on a large plank with constant velocity.

(D) Two trolleys are resting on a smooth horizontal surface and a man standing on one of the trolleys jumps to the other with relative velocity of 4 m/s

Column–II

(P) Centre of mass of the complete system shown will not move horizontally

(Q) Centre of mass of the complete system shown will move horizontally

(R) Mechanical energy of the system will be conserved

(S) Mechanical energy of the system will increase

(T) Linear momentum of the complete system will always remain constant

Space for Rough Work

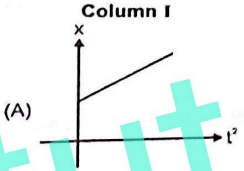
PHYSICS

Match the following:

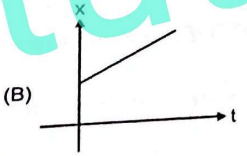
Column I gives some graphs for a particle moving along x-axis in positive x–direction. The variables v, x and t represent speed of particle, x–coordinate of particle and time respectively. Column II gives certain resulting interpretation. Match the graphs in Column I with the statements in Column II and indicate your answer by darkening appropriate bubbles in the 4 ×5 matrix given in the OMR.

Column I

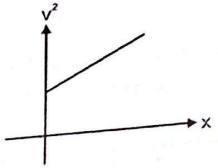
(A)



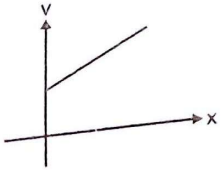
(B)



(C)



D)



Column II

(P) acceleration is uniform and non zero

(Q) acceleration is non uniform

(R) velocity is uniform

(S) velocity is non-uniform

(T) kinetic energy is increasing

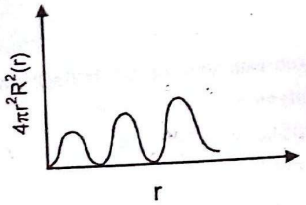
40. For the reaction

$$NaOH_{(Hot\ \&\ Conc.)} + Cl_2 \rightarrow NaCl + NaClO_3$$

The correct statement(s) in the balanced equation is/are :

(A) Chlorine is oxidized.
(B) Chlorine is reduced.
(C) H_2O is one of the products.
(D) Stoichiometric coefficient of $NaClO_3$ is 5.

41. For similar nature of below graph where $n \leq 5$, select correct statement(s).



(A) Angular node present in orbital may be 1
(B) Angular nodes present in orbital may be 3
(C) For possible orbitals magnetic quantum number may be 2
(D) For possible orbital value of total nodes must be less than 4

42. A sample of 50% CuS by mass reacts with 50% HNO_3 sample by mass according to the reac which yields 320 g of 40% sulphur by mass with 40% yield.

$CuS + HNO_3 \longrightarrow Cu(NO_3)_2 + S + NO + H_2O$

(A) Mass of CuS sample is 1910 g.
(B) Mass of CuS sample is 955 g.
(C) Mass of HNO_3 sample is 3360 g.
(D) Mass of HNO_3 sample is 1680 g.

Space for Rough Work

3. For the reaction : $Br_2(g) + 3F_2(g) \rightleftharpoons 2BrF_3(g)$ the equilibrium constant at 200K and 1.0 bar is 5.25. When the pressure is increased by 8-fold at 200 K, then which is true for the equilibrium constant ?

(A) Increases by a factor of 1.86
(B) Decreases by a factor of 1.86
(C) Remains same
(D) Increases by a factor of 8.

. For the reaction $A(g) + B(g) \rightleftharpoons 3C(g)$, at 25°C, a 5L rigid vessel contains 4, 2 and 1 mol of A, B and C respectively. The direction of reaction is :

(A) Forward if K_c for the reaction is 10^{-3} mol lit^{-1}
(B) Backward if K_c for the reaction is 5×10^{-3} mol lit^{-1}
(C) Forward if K_c for the reaction is 5×10^{-3} mol lit^{-1}
(D) Forward if K_c for the reaction is 3×10^{-2} mol lit^{-1}

Which statement regarding to bond angle is/are incorrect?

(A) Bond angle F–O–F in OF_2 is less than H–O–H bond angle in H_2O.
(B) F–C–F bond angle in CF_4 is less than Br–C–Br bond angle in CBr_4.
(C) F–B–F bond angle in BF_3 is larger than F–B–F bond angle in BF_4^-.
(D) H–S–H bond angle in H_2S is larger than H–O–H bond angle in H_2O.

Which of the following contain sp^2 hybridized oxygen atoms?

(A) P_4O_6
(B) H_3O^+
(C) $B(OH)_4^-$
(D) H_3BO_3

47. The correct order of radii is :

(A) $N < Be < B$

(B) $F^- < O^{2-} < N^{3-}$

(C) $Na < Li < K$

(D) $Fe^{+4} < Fe^{3+} < Fe^{2+}$

48. Identify the species containing three centered two electron bond. (Banana bonds)

(A) $(BeH_2)_n$ (B) BF_3 (C) Al_2Cl_6 (D) B_2H_6

49. Which of the following statements is/are true for the acids [H_2CO_3, $H_2N_2O_2$, $HClO_2$, H_2SO_5]

(A) H_2CO_3 is acid of carbon and the correct name is carbonic acid.

(B) The correct name of $H_2N_2O_2$ is hyponitrous acid

(C) $HClO_2$ is perchloric acid of chlorine

(D) Peroxo mono sulphuric acid is H_2SO_5

50. At least one element in its highest possible oxidation state is present in which of the following ?

(A) BrF_5

(B) BO_2^-

(C) F_2

(D) XeF_6

51. Which of the following is/are incorrect order of boiling point?

(A) $T_2 < D_2 < H_2$

(B) n-pentane < neopentane

(C) Xe < Ar < He

(D) p-nitrophenol > o–nitrophenol

SECTION – 2 : (Maximum Marks : 24)

This section contains **THREE** questions

Each question contains two columns, **Column I** and **Column II**

Column I has **four** entries (A),(B), (C) and (D)

Column II has **five** entries (P),(Q), (R), (S) and (T)

Match the entries in **Column I** with the entries in **Column II**

One or more entries in **Column I** may match with one or more entries in **Column II**

The ORS contains a 4 × 5 matrix whose layout will be similar to the one shown below :

(A) (P) (Q) (R) (S) (T)

(B) (P) (Q) (R) (S) (T)

(C) (P) (Q) (R) (S) (T)

(D) (P) (Q) (R) (S) (T)

For each entry in **Column I**, darken the bubbles of all the matching entries. For example, if entry (A) in **Column I** matches with entries (Q), (R) and (T), then darken these three bubbles in the ORS. Similarly, for entries (B), (C) and (D).

Marking scheme :

For each entry in **Column I**

+2 If only the bubble(s) corresponding to all the correct match(es) is (are) darkened

0 If none of the bubbles is darkened

–1 In all other cases

Space for Rough Work

52. Match the reaction in column-I with the (a) molar ratio of their respective reductant and oxidant and (b) number of water molecules produced in balanced reaction (with lowest possible integers) values given in column-II.

Column–I

(A) $Bi_2O_3 + ClO^- + OH^- \rightarrow BiO_3^- + Cl^-$

(B) $MnO + PbO_2 + H^+ \rightarrow MnO_4^- + Pb^{2+}$

(C) $TeO_3^{2-} + I^- + H^+ \rightarrow Te + I_2$

(D) $[Fe(CN)_6]^{3-} + Cr_2O_3 + OH^- \rightarrow [Fe(CN)_6]^{4-} + CrO_4^{2-}$

Column–II

(P) 4 molar ratio

(Q) 2/5 molar ratio

(R) $\frac{1}{2}$ molar ratio

(S) Number of water molecules produced is odd number

(T) Number of water molecules produced is even number

53. Match the molecule given in column-I with the charecteristic(s) given in column-II

Column - I

(A) $SiCl_4$

(B) SF_4

(C) BF_3

(D) XeO_3

Column II

(P) All the bonds (i.e. bond length) equal

(Q) All bond angles are equal

(R) d-orbital(s) including in hybridisation

(S) One lone pair on the central atom.

(T) Shape of the molecule is tetrahedral

54. **Column - I**

(A) Increasing order of ionisation energy

(B) Increasing order of electron affinity

(C) Increasing order of atomic size

(D) Increasing order of Z_{eff}

Column II

(P) $F < O < S < Se$

(Q) $O < N < F < Ne$

(R) $Na < Mg < Al < Si$

(S) $O^{2-} < O^- < O < O^+$

(T) $F < Cl < Br < I$

Space for Rough Work