

IDEABOARD NAMMA EXPERTS PU COLLEGE

1ST YEAR JEE MAINS SEP 16

16 Sep 2023

Student ID :
Total Marks : 360
Duration : 216

General Instructions:

- Use Blue/Black ball point pen only for writing particulars on this page/markings responses.
- The test is of 3 hour duration and consists of 90 questions. Each question carries 4 marks. For each correct response the candidate will get 4 marks. For each incorrect response, one mark will be deducted.
- Rough work is to be done on the space provided for this purpose in the text booklet only.
- On completion of the test, the candidate must handover the answer sheet to the invigilator in the room/Hall.
- The candidates should ensure that the Answer sheet is not folded. Do not make any stray marks on the Answer sheet. Do not write your roll no. anywhere else except in the specified space in the Test booklet/Answer Sheet.
- Use of white fluid for correction is not permissible on the Answer Sheet.

Topics Covered:

Chemistry:

Group 16 Elements-Chemical Properties And Trends In Chemical Reactivity, Introduction & General Properties, Sulphuric Acid, Ozone, Compounds Of Sulphur (SO_2 , SO_3 , Oxyacids of Sulphur), Allotropes Of Sulphur, Dioxygen and Simple Oxides .

Maths:

Matrices-Special Types Of Matrices, Order Of Matrices, Types Of Matrices, Miscellaneous, Symmetric, Skew Symmetric And

Properties, Algebra Of Matrices.

Physics:

Oscillations & Simple Harmonic Motion-Superposition of SHM, Oscillations Of Loaded Spring, Simple Pendulum and Applications, Force Law Of SHM, Equations of SHM & Reference Circle, Systems Executing SHM, Velocity, Acceleration and Periodicity of SHM, Damped and Forced Oscillations, Energy in SHM.

Maths

1) If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ then $A^2 =$

(1) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (2) $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

(3) $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$ (4) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

2) If matrix $A = (a_{ij})_{2 \times 2}$, where $a_{ij} = \begin{cases} 1 & i \neq j \\ 0 & i = j \end{cases}$ then $A^2 =$

(1) I (2) A

(3) O (4) None of these

3) On using elementary row operation $R_1 \rightarrow R_1 - 3R_2$ in the following matrix equation

$$\begin{bmatrix} 4 & 2 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}. \text{ We have}$$

(1) $\begin{bmatrix} -5 & -7 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & -7 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}$

(2) $\begin{bmatrix} -5 & -7 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} -1 & -3 \\ 1 & 1 \end{bmatrix}$

(3) $\begin{bmatrix} -5 & -7 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 1 & -7 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}$

(4) $\begin{bmatrix} 4 & 2 \\ 3 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ -3 & -3 \end{bmatrix} \begin{bmatrix} 2 & 0 \\ 1 & 1 \end{bmatrix}$

4) Choose the correct answer

(1) every scalar matrix is an identity matrix

(2) Every identity matrix is a scalar matrix

(3) Every diagonal matrix is an identity matrix

(4) A square matrix whose each element is 1 is an identity matrix

5) The minimum number of zero's in an upper triangular matrix of order $n \times n$, is

- (1) $\frac{n(n-1)}{2}$ (2) $\frac{n(n+1)}{2}$
 (3) $\frac{n(n^2-1)}{2}$ (4) None of these

6) If $\begin{bmatrix} 2x+y & 4x \\ 5x-7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y-13 \\ y & x+6 \end{bmatrix}$ then

- (1) $x=3, y=1$ (2) $x=2, y=3$
 (3) $x=2, y=4$ (4) $x=3, y=3$

7) Let $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & a \\ 4 & b \end{bmatrix}$. If

$(A+B)^2 = A^2 + B^2$, then $(a, b) =$

- (1) $(1, -1)$ (2) $(-1, 1)$
 (3) $(1, 1)$ (4) $(-1, -1)$

8) The symmetric part of the matrix

$$A = \begin{pmatrix} 1 & 2 & 4 \\ 6 & 8 & 2 \\ 2 & -2 & 7 \end{pmatrix} \text{ is}$$

(1) $\begin{pmatrix} 0 & -2 & -1 \\ -2 & 0 & -2 \\ -1 & -2 & 0 \end{pmatrix}$

(2) $\begin{pmatrix} 1 & 4 & 3 \\ 2 & 8 & 0 \\ 3 & 0 & 7 \end{pmatrix}$

(3) $\begin{pmatrix} 0 & -2 & 1 \\ 2 & 0 & 2 \\ -1 & 2 & 0 \end{pmatrix}$

(4) $\begin{pmatrix} 1 & 4 & 3 \\ 4 & 8 & 0 \\ 3 & 0 & 7 \end{pmatrix}$

9) If $AB = C$ then matrices A, B, C are

- (1) $A_{2 \times 3}, B_{3 \times 2}, C_{2 \times 3}$
 (2) $A_{3 \times 2}, B_{2 \times 3}, C_{3 \times 2}$
 (3) $A_{3 \times 3}, B_{2 \times 3}, C_{3 \times 3}$
 (4) $A_{3 \times 2}, B_{2 \times 3}, C_{3 \times 3}$

10) If $\text{tr}(A) = 3, \text{tr}(B) = 5$ then $\text{tr}(AB) =$

- (1) 15 (2) 8
 (3) $3/5$ (4) Cannot say

11) If A is a skew-symmetric matrix and n is odd positive integer then A^n is

- (1) Symmetric matrix
 (2) Skew symmetric matrix
 (3) Identity matrix
 (4) Diagonal matrix

12) If P and Q are symmetric matrices of the same order then $PQ - QP$ is

- (1) skew symmetric matrix
 (2) zero matrix
 (3) symmetric matrix
 (4) identity matrix

13) If $A = [a_{ij}]$ is a skew symmetric matrix of order ' n ' then $\sum a_{ii} =$

- (1) 0 (2) 1 (3) -1 (4) n

14) If A and B are two matrices of the order $3 \times m$ and $3 \times n$, respectively, and $m = n$, then the order of matrix $(5A - 2B)$ is

- (1) $m \times 3$ (2) 3×3
 (3) $m \times n$ (4) $3 \times n$

15) If $A = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then which one of the following holds for all $n \geq 1$ (by the principle of mathematical induction)

- (1) $A^n = nA + (n-1)I$
 (2) $A^n = 2^{n-1}A + (n-1)I$
 (3) $A^n = nA - (n-1)I$
 (4) $A^n = 2^{n-1}A - (n-1)I$

16) If B is an idempotent matrix and $A = I - B$ then $AB =$

- (1) I (2) 0 (3) $-I$ (4) B

17) If A is a skew-symmetric matrix of order 3 then $\text{tr}(A) =$

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

18) If $A = [a_{ij}]$ is a scalar matrix of order $n \times n$ such that $a_{ii} = k$ for all i , then trace of $A =$

- (1) nk (2) $n+k$ (3) n/k (4) $n-k$

19) Let α be the root of the equation $x^2 + x + 1 = 0$

and the matrix $A = \frac{1}{\sqrt{3}} \begin{bmatrix} 1 & 1 & 1 \\ 1 & \alpha & \alpha^2 \\ 1 & \alpha^2 & \alpha^4 \end{bmatrix}$ then the

matrix A^{31} is equal to

- (1) A (2) A^2 (3) A^3 (4) A^4

20) If $\begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ is to be square root of the two rowed

unit matrix, then α, β and γ should satisfy the relation

- (1) $1 + \alpha^2 + \beta\gamma = 0$
 (2) $1 - \alpha^2 - \beta\gamma = 0$
 (3) $1 - \alpha^2 + \beta\gamma = 0$
 (4) $1 + \alpha^2 - \beta\gamma = 0$

21) Total number of possible symmetric matrices of order 3×3 , whose entries 0 or 2.

22) If $A = \begin{bmatrix} 2 & 1 \\ 4 & 1 \end{bmatrix}$; $B = \begin{bmatrix} 3 & 4 \\ 2 & 3 \end{bmatrix}$ and

$$C = \begin{bmatrix} 3 & -4 \\ -2 & 3 \end{bmatrix}$$

then (tr denotes trace of a matrix)

$$\text{tr}(A) + \text{tr}\left(\frac{A(BC)}{2}\right) + \text{tr}\left(\frac{A(BC)^2}{4}\right) + \text{tr}\left(\frac{A(BC)^3}{8}\right) + \dots \infty =$$

23) A square matrix P satisfies $P^2 = I - P$ where I is identity matrix. If $P^n = 5I - 8P$, then n is

24) If $\text{tr}(A) = 2 + i$ then $\text{tr}((2 - i)A) =$

25) The sequence of matrices is defined as given below

$$m(1) = [1], m(2) = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}, m(3) = \begin{bmatrix} 6 & 7 & 8 \\ 9 & 10 & 11 \\ 12 & 13 & 14 \end{bmatrix} \text{ and so on then the trace of } m(17) \text{ is}$$

26) Total number of possible matrices of order 3×3 with each entry 2 or 0 is

27) If the traces of A, B are 19 and 8 then the trace of A - B is

28) The number of 2×2 matrices that can be formed by using 1,2,3,4 without repetition is

29) If $\begin{bmatrix} 1 & x & 2 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 5 \\ 0 & 2 & 3 \end{bmatrix} \begin{bmatrix} x \\ -1 \\ 2 \end{bmatrix} = 0$ then x =

30) If $A = \begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$ and $A^2 = I$ then x =

Physics

31) Pendulum after some time becomes slow in motion and finally stops due to

- (1) Air friction (2) Earth's gravity
(3) Mass of pendulum (4) None of these

32) A simple harmonic wave having an amplitude a and time period T is represented by the equation $y = 5 \sin \pi(t + 4)m$. The value of amplitude (a) in (m) and time period (T) in second are:

- (1) $a = 10, T = 2$ (2) $a = 5, T = 1$
(3) $a = 10, T = 1$ (4) $a = 5, T = 2$

33) The equation of the resulting oscillation obtained by the summation of two mutually perpendicular oscillations with the same frequency

$f_1 = f_2 = 5 \text{ Hz}$ and same initial phase is $\delta_1 = \delta_2 = 60^\circ$, (given, their amplitudes are $A_1 = 0.1 \text{ m}$ and $A_2 = 0.05 \text{ m}$)

- (1) $0.15 \sin(10\pi t + \frac{\pi}{6})$
(2) $0.05 \sin(10\pi t + \frac{2\pi}{3})$
(3) $0.132 \sin(10\pi t + \frac{\pi}{3})$
(4) $0.313 \sin(10\pi t + \frac{\pi}{2})$

34) For a particle executing SHM, which of the following statements is incorrect?

- (1) The total energy of the particle always remains the same
(2) The restoring force of always directed towards a fixed point
(3) The restoring force is maximum at the extreme positions
(4) The acceleration of the particle is maximum at the equilibrium position

35) Lissajous figures refer to

- (1) Lines of force of an electric dipole
(2) Lines of force of a magnet in earth's magnetic field
(3) The path of a fluid particle in motion in case of steady flow
(4) The path of a particle under the action of two orthogonal SHMs

36) With symbols having the usual meanings, which of the following expressions correctly represents forced oscillation?

- (1) $\frac{d^2y}{dt^2} + \omega^2 y = 0$
(2) $\frac{d^2y}{dt^2} + = 0$
(3) $\frac{d^2y}{dt^2} + 2k \frac{dy}{dt} + \omega^2 y = 0$
(4) $m \frac{d^2y}{dt^2} + b \frac{dy}{dt} + k y = F \sin \omega_D t$

37) If a watch with a wound spring is taken on to the moon, it

- (1) Runs faster (2) Runs slower
(3) Does not work (4) Shows no change

38) The time period of a simple pendulum is T . When its length is increased by 10 cm, the period is T_1 . When the length is decreased by 10 cm, its period is T_2 . Then the relation between T , T_1 , T_2 is

- (1) $\frac{2}{T_2} = \frac{T}{T_1^2} + \frac{T}{T_2^2}$
 (2) $\frac{2}{T_2} = \frac{T}{T_1^2} - \frac{T}{T_2^2}$
 (3) $2T^2 = T_1^2 + T_2^2$
 (4) $2T^2 = T_1^2 - T_2^2$

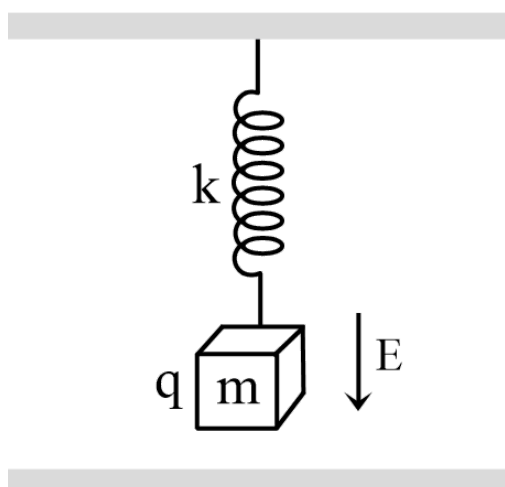
39) A simple pendulum is executing SHM with a time period T . If the length of the pendulum is increased by 21%, the percentage increase in the time period of the pendulum of increased length is

- (1) 10% (2) 21%
 (3) 30% (4) 50%

40) The length of the second pendulum on the surface of the earth is 1 m. The length of seconds pendulum on the surface of the moon, where g is $1/6$ th value of g on the surface of the earth, is:

- (1) $1/6$ m (2) 6 m
 (3) $1/36$ m (4) 36 m

41) Time period of a block suspended from the upper plate of a parallel plate capacitor by a spring of stiffness k is T . When block is uncharged. If a charge q is given to the block then, the new time period of oscillation will be



- (1) T (2) $> T$ (3) $< T$ (4) $\geq T$

42) A particle executes an SHM of time period T . Find the time taken by the particle to go directly from its mean position to half the amplitude.

- (1) $T/2$ (2) $T/4$
 (3) $T/8$ (4) $T/12$

43) Assertion: The periodic time of a hard spring is less as compared to that of a soft spring.

Reason: The periodic time depends upon the spring constant, and spring constant is large for hard spring.

- (1) If the assertion and reason are true and the reason is correct explanation of the assertion
 (2) If both assertion and reason are true but reason is not correct explanation of assertion
 (3) If assertion is true, but reason is false
 (4) If both the assertion and reason are false

44) Which of the following quantity does NOT change due to damping of oscillations ?

- (1) Angular frequency (2) Time period
 (3) Initial phase (4) Amplitude

45) A body dropped from a height h on the floor makes an elastic collision with the floor. The frequency of oscillation of its periodic motions is

- (1) $\frac{1}{2} \sqrt{\frac{g}{2h}}$ (2) $\frac{1}{2} \sqrt{\frac{2h}{g}}$
 (3) $\frac{1}{2\pi} \sqrt{\frac{g}{2h}}$ (4) $2\pi \sqrt{\frac{g}{2h}}$

46) Select the correct statements

- (1) A SHM is necessarily periodic
 (2) A SHM is necessarily oscillatory
 (3) An oscillatory motion is necessarily periodic
 (4) A periodic motion is necessarily oscillatory

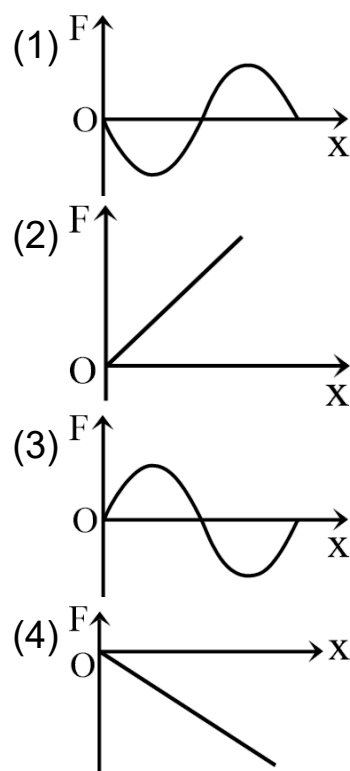
47) Two pendulum of different lengths are in phase at the mean position at a certain instant. The minimum time after which they will be again in phase is $5T/4$, where T is the time period of shorter pendulum. Find the ratio of lengths of two pendulums

- (1) 1 : 16 (2) 1 : 4
 (3) 1 : 2 (4) 1 : 25

48) The ratio of kinetic energy to the potential energy of a particle executing SHM at a distance equal to half its amplitude is: (the distance is measured from its equilibrium position)

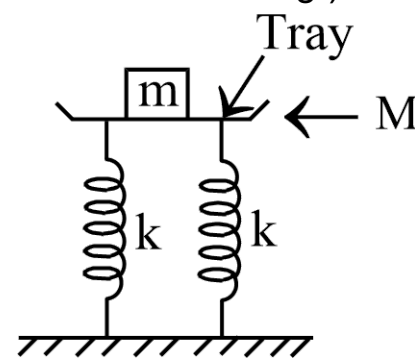
- (1) 3:1 (2) 4:1 (3) 2:1 (4) 8:1

- 49) A particle is performing SHM. Its displacement from the mean position is x , the corresponding resultant force on it is F and acceleration is a . Which of the following graphs is correct?



- 50) A particle of mass m is acted upon by a force $F = t^2 - kx$. Initially, the particle is at rest at the origin. Then:
- Its displacement will be in simple harmonic
 - Its velocity will be in simple harmonic
 - Its acceleration will be in simple harmonic
 - Particle will move with constant velocity
- 51) A particle executes SHM with an angular velocity and maximum acceleration of 3.5 rad/sec and 7.5 m/s^2 respectively. The amplitude of oscillation is
(Note : The answer should be m)
- 52) The maximum velocity of a SHM represented by $y = 3 \sin \left(100t + \frac{\pi}{6} \right) \text{ cm}$ is given by (cm/s)
- 53) A particle executes SHM with a period of 8 s. Half a second after it crosses the equilibrium position, it is at a point P. The minimum time interval after which it will be again at P is:
(Note : The answer should be s)
- 54) A body executes SHM under the action of a force F_1 with a time period $(4/5) \text{ s}$. If the force changes to F_2 , it executes SHM with time period $(3/5) \text{ s}$. If both the forces F_1 and F_2 act simultaneously in the same direction on the body, its time period (in seconds) is:

- 55) A tray of mass $M = 10 \text{ kg}$ is supported on two identical springs, each of spring constant k , as shown in the figure. When the tray is depressed a little and released, it executes SHM of period 1.5 s. When a block of mass m is placed on the tray, the period of oscillation becomes 3 s. The value of m is:
(Note : The answer should be kg)



- 56) A particle of mass 200 g executes SHM. The restoring force is provided by a spring of force constant 80 N/m . The time period of oscillations is
(Note : The answer should be s)
- 57) The total energy of a particle executing SHM is 80 J. What is the potential energy when the particle is at a distance of $3/4$ of amplitude from the mean position?
(Note : The answer should be J)
- 58) For a body in SHM the velocity is given by the relation $V = \sqrt{144 - 16x^2} \text{ ms}^{-1}$. The maximum acceleration is
(Note : The answer should be m/s^2)
- 59) The velocity of a particle in SHM at the instant when it is 0.6 cm away from the mean position is 4 cm/s. If the amplitude of vibration is 1 cm then its velocity at the instant when it is 0.8 cm away from the mean position is
(Note : The answer should be cm/s)
- 60) The amplitude of SHM $y = 2 \left(\sin 5\pi t + \sqrt{3} \cos 5\pi t \right)$ is

Chemistry

- 61) The correct boiling points order of 16^{th} group hydride is
- $\text{H}_2\text{O} > \text{H}_2\text{S} > \text{H}_2\text{Te} > \text{H}_2\text{Se}$
 - $\text{H}_2\text{S} > \text{H}_2\text{O} > \text{H}_2\text{Te} > \text{H}_2\text{Se}$
 - $\text{H}_2\text{O} > \text{H}_2\text{Te} > \text{H}_2\text{Se} > \text{H}_2\text{S}$
 - $\text{H}_2\text{O} > \text{H}_2\text{S} > \text{H}_2\text{Se} > \text{H}_2\text{Te}$
- 62) The acidity of diprotic acids in aqueous solutions increases in the order:
- $\text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$
 - $\text{H}_2\text{Se} < \text{H}_2\text{S} < \text{H}_2\text{Te}$
 - $\text{H}_2\text{Te} < \text{H}_2\text{S} < \text{H}_2\text{Se}$
 - $\text{H}_2\text{Se} < \text{H}_2\text{Te} < \text{H}_2\text{S}$

63) The compound formed during tailing of mercury is

- (1) Hg_2O (2) HgO
(3) $HgCl_2$ (4) $HgO \cdot HgCl_2$

64) In the tailing of mercury ozone oxidises X to Y. X and Y are respectively

- (1) Hg, Hg(I)O (2) Hg, Hg(II)O
(3) Hg(I)O, Hg(II)O (4) Hg(II)O, Hg(I)O

65) The number of sigma and pi bonds in peroxydisulphuric acid are respectively:

- (1) 9 and 4 (2) 11 and 4
(3) 4 and 8 (4) 4 and 9

66) Identify the correct statements.

- (i) $\gamma - SO_3$ exists as cyclic Trimer
(ii) Meta phosphoric acid exists as cyclic Trimer
(iii) NO and NO_2 both exist as dimers in the solid state

(iv) $\beta - SO_3$ exists in chain form

- (1) i, ii, iii, iv (2) Only i, ii, iii, iv
(3) Only i, ii (4) Only i, iv

67) Identify the correct sequence of increasing number of π bonds in structure of the following molecules

i. $H_2S_2O_6$ ii. H_2SO_3 iii. $H_2S_2O_5$

- (1) i, ii, iii (2) ii, iii, i (3) ii, i, iii (4) i, iii, ii

68) Sulphur exists as S_8 , S_6 , S_4 and S_2 under different conditions. Which of the following statements is correct?

- (1) Mass of one mole of each of them is same
(2) Number of molecules in one mole of each of them is same
(3) Number of atoms in one mole of each them is same
(4) All are correct statements

69) What volume of O_2 is soluble in $100cm^3$ of water at 293 K.

- (1) $3.08 cm^3$ (2) $30.8 cm^3$
(3) $1.02 cm^3$ (4) $4.2 cm^3$

70) Which of the following reaction does not produce SO_2 ?

- (1) $Ag + H_2SO_4 (con) \xrightarrow{\Delta}$
(2) $CaSO_4 + C \xrightarrow{\Delta}$
(3) $FeS_2 + O_2 \xrightarrow{\Delta}$
(4) $Zn + H_2SO_4 (dil) \xrightarrow{\Delta}$

71) Which of the following statements regarding sulphur is incorrect?

- (1) S_2 molecule is paramagnetic
(2) Viscosity of liquid sulphur increases with increase in temperature
(3) At room temperature most stable allotrope of sulphur is rhombic sulphur
(4) The oxidation state of sulphur is never less than +4 in its compounds.

72) In the direct estimation of Oxygen which of the following chemical is used.

- (1) I_2 (2) I_2O_5
(3) IF_7 (4) HIO_3

73) In which of the following minerals sulphur exist as sulphates?

I = Barytes II = Galena

III = Epsomsalt IV = copper pyrites

V = Gypsum

- (1) I, III, V (2) II, III, IV
(3) III, IV, V (4) All

74) On addition of conc. H_2SO_4 to a chloride salt, colourless fumes are evolved but in case of iodide salt, violet fumes come out. This is because

- (1) H_2SO_4 reduces HI to I_2
(2) HI is of violet colour
(3) HI gets oxidised to I_2
(4) HI changes to HIO_3

75) Which of the following does not contain ' $S - S'$ ' bond.

- (1) Polythionic acid (2) Marshall's acid
(3) Dithionic acid (4) All the above

76) The correct order of $O - O$ bond length in O_2 , H_2O_2 and O_3 is:

- (1) $O_3 > H_2O_2 > O_2$
(2) $O_2 > H_2O_2 > O_3$
(3) $O_2 > O_3 > H_2O_2$
(4) $H_2O_2 > O_3 > O_2$

77) Which of the following is acidic

- (1) SO_3 (2) N_2O
(3) BeO (4) HgO

78) ZnO when heated with BaO at $1100^{\circ}C$ gives a compound. Identify the compound

- (1) $BaZnO_2$ (2) $BaO_2 + Zn$
(3) $BaCdO_2$ (4) $Ba + ZnO_2$

- 79) Which of the following is incorrect about S_8 molecule
- (1) No. of lone pairs : 16
 - (2) covalency : 2
 - (3) Bond order : 1
 - (4) Bond length : 205.7 pm
- 80) Rhombic sulphur consists of
- (1) S_8 chains (2) S_2 molecules
 - (3) S_4 rings (4) S_8 rings
- 81) The number of lone pairs available on the central atom of sulphur tetra fluoride is
- 82) 50 ml of O_2 was subjected to silent electric discharge, if 10% oxygen converts into ozone, then volume of ozonised oxygen in ml
- 83) The oxidation state of sulphur in its octahedral halide is
- 84) 25 ml of O_2 contracts to 20 ml when subjected to silent electric discharge in an ozonizer. What further contraction would be observed if the partially ozonized oxygen is treated with oil of cinnamon (which absorbs ozone). All volume are reported at the same temperature and pressure
(Note : The answer should be ml)
- 85) A sample of oleum is labelled 109%. The % of free SO_3 in the free sample is
(Note : The answer should be %)
- 86) Maximum number of unpaired electrons available in the highest excitation state of sulphur is
- 87) 200 ml. of pure and dry oxygen gas is subjected to silent electric discharge. The volume of ozonised oxygen obtained is 190 ml. What is the percentage conversion of oxygen to ozone?
- 88) 200 ml of pure oxygen is subjected to electric discharge, 15% oxygen is converted into ozone. The volume of ozonised oxygen is
(Note : The answer should be ml)
- 89) The number of $S - O - S$ bonds in sulphur trioxide trimer is/are
- 90) Number of volumes of O_2 formed when 3 volumes of Ozone decomposes