Sky Tutorials
fly beyond the sky...
IIT-JEE | NEET | Foundation
JEE

Time: 3 Hours **M.M. 300**

ALL INDIA SKY TEST SERIES

TARGET BATCH – IIT - JEE

Date : 10/09/2023

SYLLABUS

PHYSICS	CHEMISTRY	MATHEMATICS
Work, Power & Energy	**Ionic Equilibrium + G.O.C. + Bonding + Previous**	**Previous + Parabola + Ellipse + Hyperbola**

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

INSTRUCTIONS:

1. This Question paper is divided in to three parts Physics, Chemistry and Mathematics each part is further divided into two sections.
   Section –A Contains 20 Questions Section B contains 10 questions. Please ensure that the Questions paper you have received contains **ALL THE QUESTIONS** in each Part.
2. **In Section A all the 20 Questions are compulsory and Section B Contain 10 Question, out of these 10 Questions**, candidates can choose to attempt any 5 Questions.
   Each Question has four choices (A), (B), (C), (D) out of which **only one is correct & Carry 4 marks each 1 mark** will be deducted for each wrong answer.

GENERAL INSTRUCTION

1. Use only **blue/black pen (avoid gel pen)** for darkening the bubble.
2. Indicate the correct answer for each question by filling appropriate bubble in your **OMR** answer sheet.
3. The answer sheet will be checked through computer hence, the answer of the question must be marked by –shading the circles against the question by dark **blue/black pen**
4. Blank papers, Clipboards, Log tables, Slide Rule, Calculator, Cellular Phones Papers and Electronic Gadgets in any form are **not** allowed to be carried inside the examination hall.

Name of the candidate:-_____

Signature of the candidate:- _____**Signature of the invigilator:**_____

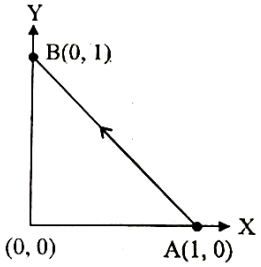
PHYSICS

Section - A

Single Choice Question

1. A person pushes a box on a rough horizontal platform surface. He applies a force of 200 N over a distance of 15 m. Thereafter, he gets progressively tired and his applied force reduces linearly with distance to 100 N. The total distance through which the box has been moved is 30 m. What is the work done by the person during the total movement of the box ?
(a) 3280 J (b) 2780 J
(c) 5690 J (d) 5250 J

2. Consider a force $\vec{F} = x\hat{i} + y\hat{i}$. The work done by this force in moving a particle from point A(1,0) to B(0,1) along the line segment is : (all quantities are in SI units)



(a) 2J (b) $\frac{1}{2}J$ (c) 1J (d) $\frac{3}{2}J$

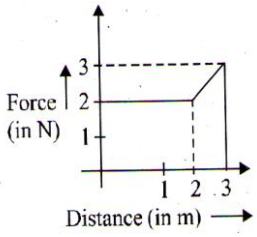
3. A spring of spring constant 5×10^3 N/m is stretched initially by 5 cm from the unstretched position. The the work required to stretch it further by another 5 cm is
(a) 12.50 N-m (b) 18.75 N-m
(c) 25.00 N-m (d) 6.25 N-m

4. Two bodies are having kinetic energies in the ratio 16 : 9. If they have same linear momentum, the ratio of their masses respectively is :
(a) 4 : 3 (b) 3 : 4 (c) 16 : 9 (d) 9 : 16

5. A ball is projected with kinetic energy E, at an angle of 60^o to the horizontal. The kinetic energy of this ball at the highest point of the flight will become
(a) Zero (b) $\frac{E}{2}$ (c) $\frac{E}{4}$ (d) E

6. A body of mass 'm' dropped from a height 'h' reaches the ground with a speed of $0.8\sqrt{gh}$. The value of work done by the air-friction is :
(a) -0.68 mgh (b) mgh
(c) 1.64 mgh (d) 0.64 mgh

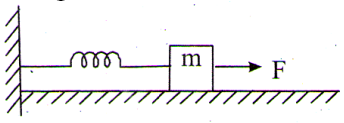
7. A particle moves in one dimension from rest under the influence of a force that varies with the distance travelled by the particle as shown in the figure. The kinetic energy of the particle after it has travelled 3 m is :



(a) 4 J (b) 2.5 J (c) 6.5 J (d) 5 J

8. A uniform cable to mass 'M' and length 'L' is placed on a horizontal surface such that its $\left(\frac{1}{n}\right)^{th}$ part is hanging below the edge of the surface. To lift the hanging part of the cable upto the surface, the work done should be :
(a) $\frac{MgL}{2n^2}$ (b) $\frac{MgL}{n^2}$
(c) $\frac{2MgL}{n^2}$ (d) $nMgL$

9. A block of mass m, lying on a smooth horizontal surface, is attached to a spring (of negligible mass) of spring constant k. The other end of the spring is fixed, as shown in the figure. The block is initially at rest in its equilibrium position. If now the block is pulled with a constant force F, the maximum speed of the block is :



(a) $\frac{2F}{\sqrt{mk}}$ (b) $\frac{F}{\pi\sqrt{mk}}$ (c) $\frac{\pi F}{\sqrt{mk}}$ (d) $\frac{F}{\sqrt{mk}}$

10. A force acts on a 2 kg object so that its position is given as a function of time as $x = 3t^2 + 5$. What is the work done by this force in first 5 seconds ?
(a) 850 J (b) 950 J (c) 875 J (d) 900 J

11. A particle is moving in a circular path of radius a under the action of an attractive potential U = $-\frac{k}{2r^2}$. Its total energy is :
(a) $-\frac{k}{4a^2}$ (b) $\frac{k}{2a^2}$
(c) zero (d) $-\frac{3}{2}\frac{k}{a^2}$

12. A body of mass $m = 10^{-2}$ kg is moving in a medium and experiences a frictional force F = - kv². Its initial speed is v_0 = 10 ms⁻¹. If, after 10 s, its energy is $\frac{1}{8}mv_0^2$, the value of k will be :

(a) $10^{-4} kg\, m^{-1}$ (b) $10^{-1} kg\, m^{-1}\, s^{-1}$

(c) $10^{-3} kg\, m^{-1}$ (d) $10^{-3} kg\, s^{-1}$

13. An object is dropped from a height h from the ground. Every time it hits the ground it losses 50% of its kinetic energy. The total distance covered as $t \to \infty$ is

(a) 3h (b) ∞ (c) $\frac{5}{3}h$ (d) $\frac{8}{3}h$

14. A time dependent force F = 6t acts on a particle of mass 1 kg. If the particle starts from rest, the work done by the force during the first 1 second will be

(a) 9 J (b) 18 J (c) 4.5 J (d) 22 J

15. At time t = 0 a particle starts moving along the x-axis. If its kinetic energy increases uniformly with time 't', the net force acting on it must be proportional to

(a) constant (b) t

(c) $\frac{1}{\sqrt{t}}$ (d) $\sqrt{t}$

16. The potential energy function for the force between two atoms in a diatomic molecule is approximately given by $U(x) = \frac{a}{x^{12}} - \frac{b}{x^6}$, where a and b are constants and x is the distance between the atoms. If the dissociation energy of the molecule is $D = \left[U(x = \infty) - U_{\text{at equilibrium}}\right]$, D is

(a) $\frac{b^2}{2a}$ (b) $\frac{b^2}{12a}$ (c) $\frac{b^2}{4a}$ (d) $\frac{b^2}{6a}$

17. A particle of mass 100g is thrown vertically upwards with a speed of 5 m/s. The work done by the force of gravity during the time the particle goes up is

(a) -0.5 J (b) -1.25 J

(c) 1.25 J (d) 0.5 J

18. A mass of M kg is suspended by a weightless string. The horizontal force that is required to displace it until the string makes an angle of 45^o with the initial vertical direction is

(a) $Mg(\sqrt{2}+1)$ (b) $Mg\sqrt{2}$

(c) $\frac{Mg}{\sqrt{2}}$ (d) $Mg(\sqrt{2}-1)$

19. A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of the particle, the motion of the particles takes place in a plane. It follows that

(a) its kinetic energy is constant

(b) Its acceleration is constant

(c) its velocity is constant

(d) it moves in a straight line

20. A body of mass 'm', accelerates uniformly from rest to 'v_1' in time 't_1'. The instaneous power delivered to the body as a function of time 't' is

(a) $\frac{mv_1t^2}{t_1}$ (b) $\frac{mv_1^2t}{t_1^2}$

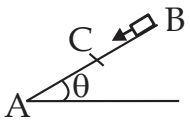
(c) $\frac{mv_1t}{t_1}$ (d) $\frac{mv_1^2t}{t_1}$

Section - B

Integer Type Questions

21. A block of mass 10 kg is moving along x-axis under the action of force $F = 5x\,N$. The work done by the force in moving the block from x = 2 m to 4 m will be……J

22. Two persons A and B perform same amount of work in moving a body through a certain distance d with application of forces acting at angle 45^o and 60^o with the direction of displacement respectively. The ratio of force applied by person A to the force applied by person B is $\frac{1}{\sqrt{x}}$. The value of x is _____.

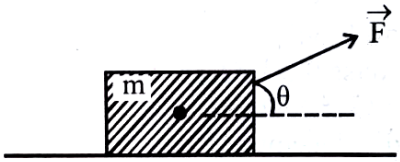
23. 

A small block starts slipping down from a point B on an inclined plane AB, which is making an angle θ with the horizontal section BC is smooth and the remaining section CA is rough with a coefficient of friction μ. It is found that the block comes to rest as it reaches the bottom (point A) of the inclined plane. If BC = 2AC, the coefficient of friction is given by $\mu = k\tan\theta$. The value of k is _____.

24. A body of mass 5 kg is moving with a momentum of 10 kg ms^{-1} . Now a force of 2 N acts on the body in the direction of its motion for 5 s. The increase in the kinetic energy of the body is _____J.

25. A particle of mass 10 g moves in a straight line with retardation 2x, where x is the displacement in SI units. Its loss of kinetic energy for above displacement is $\left(\frac{10}{x}\right)^{-n}$ J. The value of n will be _____.

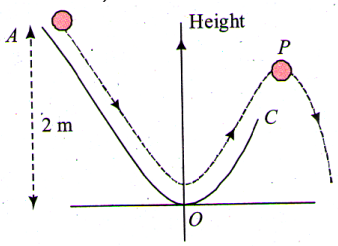
26. An object of mass 'm' initially at rest on smooth horizontal plane starts moving under the action of force F = 2N. In the process of its linear motion, the angle θ (as shown in figure) between the direction of force and horizontal varies as $\theta = kx$, where k is a constant and x is the distance covered by the object from its initial position. The expression of kinetic energy of the object will the $E = \frac{n}{k}\sin\theta$. The value of n is _____.



Smooth horizontal surface

27. A uniform chain of length 3 meter and mass 3 kg overhangs a smooth table with 2 meter laying on the table. If k is the kinetic energy of the chain in joule as it completely slips off the table, then the value of k is _____.
(Take g = 10 m/s^2)

28. A particle (m = 1 kg) slides down a frictionless track (AOC) starting from rest at a point A (height 2 m). After reaching C, the particle continues to move freely in air as a projectile. When it reaching its highest point P (height 1 m), the kinetic energy of the particle (in J) is (figure drawn is schematic and not to scale; take g = 10 ms^{-2}) _____.



29. A body of mass 2 kg is initially at rest. It starts moving unidirectional under the influence of a source of constant power P. Its displacement in 4s is $\frac{1}{3}\alpha^2\sqrt{P}$ m. The value of α will be……

30. A body of mass 2 kg is driven by an engine delivering a constant power of 1 J/s. The body starts from rest and moves in a straight line. After 9 seconds, the body has moved a distance (in m) _____

CHEMISTRY

Section - A

Single Choice Question

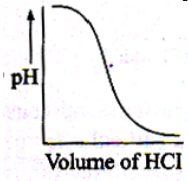
31. HCOOH and CH_3COOH solution have equal pH. If ratio of their ionization constant (K_a) is 4, then ratio of their molar concentration is
(a) 2 : 1 (b) 1: 4 (c) 4 : 1 (d) 1 : 2

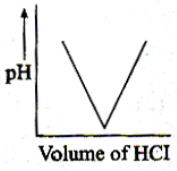
32. A weak monobasic acid is 1% ionized at 1 M. Thus, percentage ionization of the acid at 4 M is
(a) 4.0% (b) 5.0% (c) 0.2% (d) 0.5%

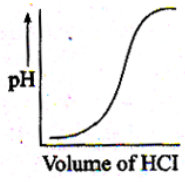
33. Calculate pH a solution of given mixture (0.1 mol CH_3COOH + 0.2 mol CH_3COONa) in 100 ml of mixture. $K_a = 2\times10^{-5}$.
(a) 5 (b) 5.6 (c) 6.6 (d) 7.6

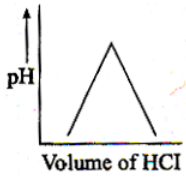
34. K_b of an acid base indicator HIn is 10^{-9}. The pH at which its 10^{-3} (M) solution shows the colour change
(a) 9 (b) 7 (c) 5 (d) 3

35. Strong base (NaOH) is being titrated with strong acid (HCl), variation of pH with volume of acid added is shown by

(a) 

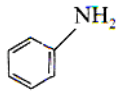
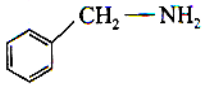
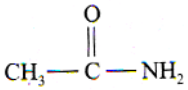
(b) 

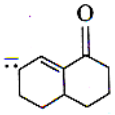
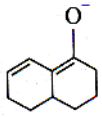
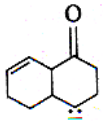
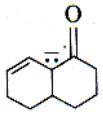
(c) 

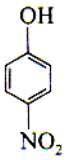
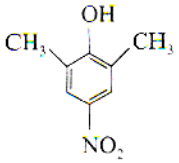
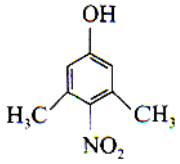
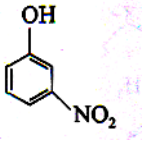
(d) 

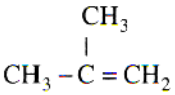
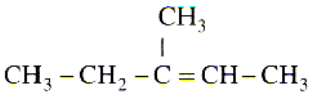
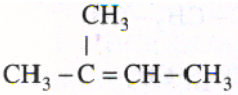
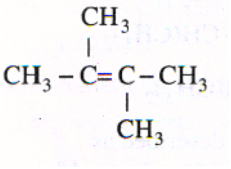
36. The solubility of $Mg(OH)_2$ in a particular buffer solution is found to be 0.65 g L^{-1}. Thus, pH of the buffer solution is
$[K_{sp}$ of $Mg(OH)_2 = 1.8\times10^{-11}]$
(a) 9.6 (b) 5.3 (c) 4.4 (d) 8.7

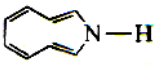
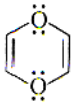
37. Which of the following resonating structures of 1-methoxy-1, 3-butadiene is least stable?
(a) $\overset{\ominus}{C}H_2-CH-CH-CH-\overset{\oplus}{O}-CH_3$
(b) $CH_2-CH_2-\overset{\ominus}{C}H-CH-\overset{\oplus}{O}-CH_3$
(c) $\overset{\ominus}{C}H_2-\overset{\oplus}{C}H-CH-CH-O-CH_3$
(d) $CH_2-CH-\overset{\ominus}{C}H-\overset{\oplus}{C}-O-CH_3$

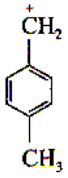
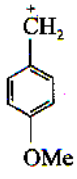
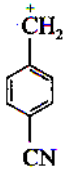
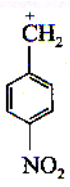
38. Arrange the following compounds in increasing order of length of their C-N bond.
I. 
II. 
III. $CH_3-CH=NH$
IV. 
(a) IV < III<I<II (b) IV < I < III < II
(c) I < IV < III < II (d) III < IV < I < II

39. Which of the following is not a resonance structure of others?
(a) 
(b) 
(c) 
(d) 

40. Arrange the following in increasing order of acidic strength.
(a) 
(b) 
(c) 
(d) 
(a) I < II < III < IV (b) I < III < II < IV
(c) I < II < IV < III (d) IV < III < II < I

41. Which of the following alkenes has a hyper conjugation structure that shows geometrical isomerism ?
(a) 
(b) 
(c) 
(d) 

42. Which of the following species is/are anti-aromatic?
(a) 
(b) 
(c) 
(d) 

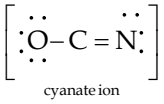
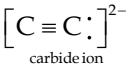
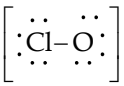
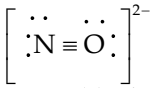
43. Arrange the following carbocation in decreasing order of stability.
(I)  (II)  (III)  (IV) 
(a) I > III > II > IV (b) IV > III > II > I
(c) III > IV > II > I (d) II > I > III > IV

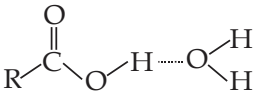
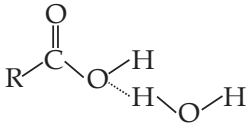
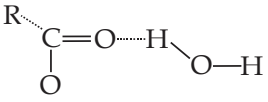
44. Molecular size of ICI and Br_2 is nearly the same, but boiling point of ICI is about 40°C higher than Br_2. This might be due to.
(a) I – Cl bond is stronger than Br – Br bond
(b) IE of I < IE of Br
(c) ICI is polar whereas Br_2 is non – polar
(d) The size of 1 > size of Br

45. Covalency of carbon in CO is three because
(a) An unexcited carbon atom has two unpaired electrons
(b) The C – atom has four valency electrons
(c) The C – atom can be an acceptor of an electron pair
(d) The maximum covalency of carbon is three

46. Consider the following species.
(I) $S_4O_6^{2-}$ (II) S_3O_9 (III) $S_2O_5^{2-}$ (IV) $P_3O_9^{3-}$
Which of the above species have same number of X – O – X linkage? (X = P or S)
(a) II and III (b) I and IV
(c) II and IV (d) I and III

47. Select the correct statement about O_2^+ and O_2
(a) O_2^+ is paramagnetic and O_2 is diamagnetic and bond order of O_2^+ is less than that of O_2
(b) O_2^+ is paramagnetic and O_2 is diamagnetic and bond order of O_2^+ is greater than that of O_2
(c) O_2^+ and O_2 both are paramagnetic and bond order of O_2^+ is greater than that O_2
(d) None of the above is correct

48. Select the correct Lewis structure out of the following
(a)  cyanate ion
(b)  carbide ion
(c)  hypochlorite ion
(d)  Nitrogen (II) oxide

49. Which of the following correctly describes the H – bonding present when a carboxylic acid dissolves in water?
(a) 
(b) 
(c) 
(d) All of these

50. Electronegativity values of element are given
K = 0.8 Ge = 1.8 H = 2.1 Cs = 0.7
P = 2.1 Cl = 3.0 S = 2.5 F = 4.0
Out of KCl, PH_3, GeCl, H_2S and CsF ionic compounds are.
(a) KCl, GeCl, CsF (b) KCl, CsF
(c) PH_3, H_2S,KCl, CsF (d) KCl, GeCl

SECTION - B

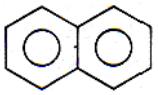
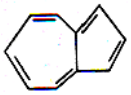
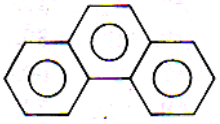
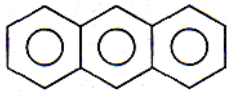
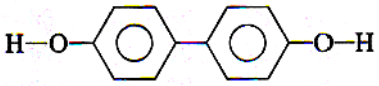
51. When 3 mol of HCl is added to 1 L of an acidic buffer, its pH changes from .9 to 2.5. The buffer capacity of the buffer solution is _____.

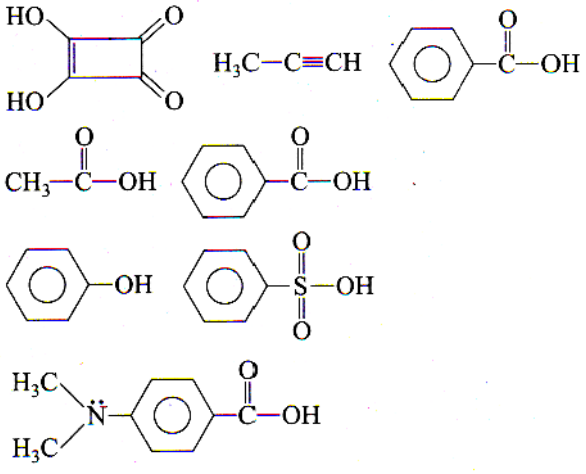
52. K_a for formic acid and acetic acid are 1.7×10^{-4} and 1.1×10^{-5} respectively. The relative strength of acid is _____.

53. How many of the following are strong electrolytes ?
(a) NH_3 (b) NH_4Cl
(c) CH_3COOH (d) CH_3COONa
(e) HCl (f) NaCl

54. A 0.1 M solution of weak monoprotic acid ($K_a = 1\times10^{-5}$) is 1% dissociated. The pH of solution is _____.

55. Ionic product of water is 10^{-12}. pH of water is_____.

56. How many of the following compounds has non zero dipole moments
(a) 
(b) 
(c) 
(d) 
(e) 
(f) 

57. Number of compounds from following liberate CO_2 on reaction with $NaHCO_3$ is


58. A complex ion $[Fe(H_2O)_6]^{2+}$ is found to be paramagnetic. Its magnetic moment is 4.89 BM. How many unpaired electrons are present?

59. A^+B^- (ionic) is formed in the following steps from gaseous atoms.

60. At 300 K and 1.00 atm, density of gaseous HF is 3.17 gL^{-1}. How many HF molecules are associated by H – bonding?

MATHEMATICS

Section - A

Single Choice Question

61. If $i=\sqrt{-1}$, then $4 + 3\left(-\frac{1}{2}+i\frac{\sqrt{3}}{2}\right)^{127}+5\left(-\frac{1}{2}+i\frac{\sqrt{3}}{2}\right)^{124}$ is equal to
(a) $4\sqrt{3}i$ (b) $2\sqrt{3}\,i$
(c) $1-\sqrt{3}\,i$ (d) $1+\sqrt{3}\,i$

62. If z and w are two complex numbers such that $|zw| = 1$ and arg(z) – arg(w) = $\pi/2$, then
(a) $\bar{z}w = i$ (b) $z\bar{w}=\frac{1}{\sqrt{2}}(-1+i)$
(c) $z\bar{w}=\frac{1}{\sqrt{2}}(1-i)$ (d) $\bar{z}w = -i$

63. If x is real, the maximum value of $\frac{3x^2+9x+17}{3x^2+9x+7}$ is
(a) $\frac{17}{7}$ (b) $\frac{1}{4}$ (c) 41 (d) 1

64. If the roots of the equation $bx^2+cx+a=0$ be imaginary, then for all real values of x, the expression $3b^2x^2+6bcx+2c^2$ is
(a) greater than -4ab
(b) less then -4ab
(c) greater than 4ab
(d) less than 4ab

65. The value of the determinant $\begin{vmatrix} \sqrt{13}+\sqrt{3} & 2\sqrt{5} & \sqrt{5} \\ \sqrt{15}+\sqrt{26} & 5 & \sqrt{10} \\ 3+\sqrt{65} & \sqrt{15} & 5 \end{vmatrix}$ is equal to :
(a) $5\sqrt{3}(\sqrt{6}-5)$ (b) $5\sqrt{3}(\sqrt{6}-\sqrt{5})$
(c) $5(\sqrt{6}-5)$ (d) $\sqrt{3}(\sqrt{6}-\sqrt{5})$

66. Let A = $\begin{bmatrix}1 & 1\\ 0 & 1\end{bmatrix}$ and B = $\begin{bmatrix}b_1 & b_2\\ b_3 & b_4\end{bmatrix}$. If $10A^{10}+Adj(A^{10})=B$, then $b_1 + b_2 + b_3 + b_4$ is equal to
(a) 91 (b) 92 (c) 111 (d) 112

67. The remainder when 7^{128} is divided by 10 is
(a) 1 (b) 3 (c) 7 (d) 9

68. The coefficient of t^{24} in $(1+t^2)^{12}(1+t^{12})(1+t^{24})$ is
(a) ${}^{12}C_6+13$ (b) ${}^{12}C_6+2$
(c) ${}^{12}C_6+1$ (d) ${}^{12}C_6$

69. The sum of the 3rd and the 4th terms of a G.P. is 60 and the product of its first three terms is 1000. If the first term of this G.P. is positive, then 7th term is :
(a) 7290 (b) 320 (c) 640 (d) 2430

70. Consider the set of all lines $px+qy+r=0$ such that $3p+2q+4r=0$. Which one of the following statements is true?
(a) The lines are concurrent at the point (3/4, 1/2)
(b) Each line passes through (0,0)
(c) The lines are parallel
(d) The lines are not concurrent

71. The circle $x^2+y^2-6x-10y+p=0$ does not touch or intersect the axes and the point (1, 4) lies inside the circle for all p in the interval
(a) (25, 35) (b) (25, 29)
(c) (0, 25) (d) (0, 29)

72. The directrix of the parabola $y^2+4x+3=0$ is
(a) $x-3/4=0$ (b) $x+1/4=0$
(c) $x-1/4=0$ (d) $x-4/3=0$

73. The line $x+y=6$ is a normal to the parabola. $y^2=8x$ at the point
(a) (18, -12) (b) (4,2)
(c) (2,4) (d) (3,3)

74. The slope of the line touching both the parabolas $y^2=4x$ and $x^2=-32y$ is :
(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $\frac{1}{8}$ (d) $\frac{2}{3}$

75. The minimum area of the triangle formed by any tangent to the ellipse $\frac{x^2}{16}+\frac{y^2}{81}=1$ and the coordinate – axes is :
(a) 12 (b) 18 (c) 26 (d) 36

76. The area (in sq. units) of the quadrilateral formed by the tangents at the end points of the latera recta to the ellipse $\frac{x^2}{9}+\frac{y^2}{5}=1$ is :

(a) $\frac{27}{4}$ (b) 18 (c) $\frac{27}{2}$ (d) 27

77. If the distance between the foci of an ellipse is half the length of its latus rectum, then the eccentricity of the ellipse is :

(a) $\frac{1}{2}$ (b) $\frac{2\sqrt{2}-1}{2}$

(c) $\sqrt{2}-1$ (d) $\frac{\sqrt{2}-1}{2}$

78. The line $4\sqrt{2}\,x-5y=40$ touches the hyperbola $\frac{x^2}{100}-\frac{y^2}{64}=1$ at the point

(a) $(10,8\sqrt{2})$ (b) $(10\sqrt{2},8)$

(c) $(20,8\sqrt{3})$ (d) $\left(\frac{20}{\sqrt{3}},\frac{8}{\sqrt{3}}\right)$

79. The curve described parametrically $x=t^2+t+1$, $y=t^2-t+1$ represents

(a) a pair of straight lines
(b) an ellipse
(c) a parabola
(d) a hyperbola

80. If e_1 is the eccentricity of the hyperbola $\frac{x^2}{49}-\frac{y^2}{36}=1$ and e_2 is the eccentricity of the hyperbola $\frac{x^2}{36}-\frac{y^2}{49}=1$, then

(a) $e_1e_2=1$ (b) $\frac{e_1}{e_2}=1$

(c) $\frac{1}{e_1^2}+\frac{1}{e_2^2}=1$ (d) $e_1^2+e_2^2=1$

Section - B

Integer Type Questions

81. If $|z+4|\le 3$, then the maximum value of $|z+1|$ i

82. The sum of all integral values of k $(k\neq 0)$ for which the equation $\frac{2}{x-1}-\frac{1}{x-2}=\frac{2}{k}$ in x has no real roots, is _____.

83. If the system of equations
$x+y+z=5, x+2y+3z=9, x+3y+\alpha z=\beta$
has infinitely many solutions, then $\beta-\alpha$ equals

84. The remainder when $(2021)^{2023}$ is divided by 7 is:

85. If $\sum_{k=1}^{10}\frac{k}{k^4+k^2+1}=\frac{m}{n}$, where m and n are co-prime, then $|n-m|$ is equal to _____.

86. The number of integral values of m so that the abscissa of point of intersection of lines $3x+4y=9$ and $y=mx+1$ is also an integer, is

87. If a circle C passing through the point (4,0) touches the circle $x^2+y^2+4x-6y=12$ externally at the point (1, -1), then the radius of C is

88. If the coordinates of two points A and B are $\left(\sqrt{7},0\right)$ and $\left(-\sqrt{7},0\right)$ respectively and P is any point on the conic, $9x^2+16y^2=144$, then PA + PB is equal to

89. If the length of the latus rectum of the ellipse $x^2+4y^2+2x+8y-\lambda=0$ is 4, and l is the length of its major axis, then $\lambda+l$ is equal to ____.

90. Let the eccentricity of the hyperbola $H:\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ be $\sqrt{\frac{5}{2}}$ and length of its latus rectum be $6\sqrt{2}$. If $y=2x+c$ is a tangent to the hyperbola H, then the value of c^2 is equal to