KGCET - 2K25
KSRM COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
KLM COLLEGE OF ENGINEERING FOR WOMEN, KADAPA
FOR ENGINEERING ASPIRANTS

EXAM. DATE.: 02-05-2025 FN (10:00AM TO 1:00PM)

MATHS

1. If $A=(3,81)$ and $f:A\to B$ is a surjection defined by $f(x)=\log_3 x$ then $B=$

   1) $[1,4]$ 2) $(1,4]$ 3) $(1,4)$ 4) $[1,\infty)$

2. If $f(x)=\dfrac{x}{\sqrt{1+x^2}}$ then $fofof(x)=$

   1) $\dfrac{x}{\sqrt{1+3x^2}}$ 2) $\dfrac{x}{\sqrt{1-x^2}}$ 3) $\dfrac{2x}{\sqrt{1+2x^2}}$ 4) $\dfrac{x}{\sqrt{1+x^2}}$

3. $\forall n\in N,\dfrac{n^4}{24}+\dfrac{n^3}{4}+\dfrac{11n^2}{24}+\dfrac{n}{4}$ is a

   1) Rational Number 2) Integer 3) Natural Number 4) Real Number

4. If A is a square matrix of order 3 then $|Adj(Adj\,A^2)|=$

   1) $|A|^2$ 2) $|A|^4$ 3) $|A|^8$ 4) $|A|^{16}$

5. Given $a_i^2+b_i^2+c_i^2=1(i=1,2,3)$ and $a_i a_j+b_i b_j+c_i c_j=0(i\neq j,i,j=1,2,3)$ then the value of

   $\begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix}$ is

   1) 0 2) $\dfrac{1}{2}$ 3) ±1 4) 2

6. The system of equation $3x+2y+z=6,3x+4y+3z=14$ and $6x+10y+8z=a$, has infinite number of solutions, if a is equal to

   1) 8 2) 12 3) 24 4) 36

7. Matrix A is given by $A=\begin{bmatrix} 6 & 11 \\ 2 & 4 \end{bmatrix}$ then the determinant of $A^{2015}-6A^{2014}$ is

   1) 2^{2016} 2) $(-11)2^{2015}$ 3) $-2^{2015}\times7$ 4) $(-9)2^{2014}$

8. If $\bar{p}=\bar{i}+a\bar{j}+\bar{k}$ and $\bar{q}=\bar{i}+\bar{j}+\bar{k}$, then $|\bar{p}+\bar{q}|=|\bar{p}|+|\bar{q}|$ is true for

   1) $a=-1$ 2) $a=1$ 3) all real values of 'a' 4) for no real values of 'a'

9. The vector $\bar{c}$ directed along the internal bisector of the angle between the vectors $2\bar{i}+3\bar{j}-6\bar{k}$ and $-2\bar{i}-\bar{j}+2\bar{k}$ with $|\bar{c}|=10\sqrt{21}$ is ___

   1) $\pm\left(-8\bar{i}+2\bar{j}-4\bar{k}\right)$ 2) $\pm10\left(-4\bar{i}+\bar{j}-2\bar{k}\right)$

   3) $\pm\left(-12\bar{i}+3\bar{j}-6\bar{k}\right)$ 4) $\pm\left(12\bar{i}+3\bar{j}+6\bar{k}\right)$

10. The orthogonal projection of $\bar{a}=2\bar{i}+3\bar{j}+3\bar{k}$ on $\bar{b}=\bar{i}-2\bar{j}+\bar{k}$ (where $\bar{i}$, $\bar{j}$, $\bar{k}$ are unit vectors along three mutually perpendicular directions) is

1) $\frac{-\bar{i}+2\bar{j}-\bar{k}}{6}$ 2) $\frac{-\bar{i}+2\bar{j}-\bar{k}}{\sqrt{6}}$ 3) $\bar{i}-2\bar{j}+\bar{k}$ 4) $-\bar{i}+2\bar{j}-\bar{k}$

11. If $\bar{A}.(\bar{B}+\bar{C})=\bar{B}.(\bar{C}+\bar{A})=\bar{C}.(\bar{A}+\bar{B})=0$ and $|\bar{A}|=3,|\bar{B}|=4$ and $|\bar{C}|=5$ then $|\bar{A}+\bar{B}+\bar{C}|=$

1) 5 2) $5\sqrt{2}$ 3) $5/\sqrt{2}$ 4) $\sqrt{2}$

12. The angle between the plane passing through the points $A(0,0,0),B(1,1,1),C(3,2,1)$ & the plane passing through $A(0,0,0),B(1,1,1),D(3,1,2)$ is

1) 90^0 2) 45^0 3) 120^0 4) 30^0

13. If $\bar{a}=2\bar{i}+2\bar{j}+\bar{k},\bar{b}=5\bar{i}+\bar{j}+2\bar{k}$ then $|\bar{a}\times\bar{b}|^2+(\bar{a}.\bar{b})^2=$

1) 270 2) 120 3) 170 4) 110

14. If $0\le x\le\pi,81^{\sin^2 x}+81^{\cos^2 x}=30$ then $x=$

1) $\frac{\pi}{6}$ 2) $\frac{\pi}{4}$ 3) $\frac{\pi}{15}$ 4) $\frac{\pi}{8}$

15. In a $\Delta PQR,\angle R=\frac{\pi}{2}$ if $\tan\left(\frac{P}{2}\right)$ and $\tan\left(\frac{Q}{2}\right)$ are the roots of the equation $ax^2+bx+c=0(a\neq 0)$ then

1) $a+b=c$ 2) $b+c=a$ 3) $a+c=b$ 4) $b=c$

16. The minimum and maximum values of $\sin^2(60^0-x)+\sin^2(60^0+x)$ are

1) $-\frac{1}{2},\frac{1}{2}$ 2) $\frac{1}{2},1$ 3) $\frac{1}{2},\frac{3}{2}$ 4) $\frac{3}{2},2$

17. If $0\le x\le 2\pi$ and $|\cos x|\le\sin x,$ then

1) $x\in\left[0,\frac{\pi}{4}\right]$ 2) $x\in\left[\frac{\pi}{4},2\pi\right]$ 3) $\left[\frac{\pi}{4},\frac{3\pi}{4}\right]$ 4) $[0,\pi]$

18. If $x^2+y^2+z^2=r^2$ then $\tan^{-1}\left(\frac{xy}{zr}\right)+\tan^{-1}\left(\frac{yz}{xr}\right)+\tan^{-1}\left(\frac{xz}{yr}\right)=$

1) π 2) $\frac{\pi}{2}$ 3) 0 4) $\frac{\pi}{4}$

19. If r_1,r_2,r_3 are the radii of the escribed circles of a ΔABC and if r is the radius of its incircle then $r_1r_2r_3-r(r_1r_2+r_2r_3+r_3r_1)=$

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

20. In an equilateral triangle $r:R:r_1$ is

1) 1:1:1 2) $1:\sqrt{2}:3$ 3) 1:2:3 4) $2:\sqrt{3}:\sqrt{3}$

21. If $\left|z-\frac{4}{z}\right|=2$ then the maximum value of $|z|$ is

1) $\sqrt{5}$ 2) $\sqrt{5}+1$ 3) $\sqrt{5}-1$ 4) $-\sqrt{5}$

22. Let $A=\frac{2}{\sqrt{3}}e^{-i\frac{\pi}{6}},B=\frac{2}{\sqrt{3}}e^{i\frac{\pi}{2}},C=\frac{2}{\sqrt{3}}e^{-i\frac{5\pi}{6}}$ be three points forming a triangle ABC in the Gussain plane then triangle ABC is

1) equilateral 2) isosceles 3) scalene 4) Right angled

23. If $\log_{\sqrt{3}}\left|\frac{|z|^2-|z|+1}{|z|+2}\right|<2$ then locus of z is

1) a circle 2) a straight line 3) interior of the circle 4) ellipse

24. If α,β are the roots of the equation $x^2-2x+4=0$, then $\alpha^5+\beta^5=$

1) 64 2) 32 3) –32 4) –64

25. The minimum value $|x|+\left|x+\frac{1}{2}\right|+|x-3|+\left|x-\frac{5}{2}\right|$ is

1) 2 2) 4 3) 6 4) 4

26. The equation $(x-3)^9+\left(x-3^2\right)^9+\left(x-3^3\right)^9+...+\left(x-3^9\right)^9=0$ has

1) all the roots are real 2) one real and 8 imaginary roots

3) real roots namely $x=3,3^2,.....3^9$ 4) five real and 4 imaginary roots.

27. If α,β,γ are the roots of the equation $x^3-x+2=0$ then the equation whose roots are $\alpha\beta+\frac{1}{\gamma},\beta\gamma+\frac{1}{\alpha},\gamma\alpha+\frac{1}{\beta}$ is

1) $2y^3+y^2+1=0$ 2) $2y^3-y^2+1=0$ 3) $y^3+y^2+1=0$ 4) $2y^3+y^2-1=0$

28. Number of real roots of the equation $\left(x^2-5x+1\right)\left(x^2+x+1\right)+8x^2=0$

1) 1 2) 2 3) 3 4) 4

29. A basket contains 4 oranges, 5 Apples, 6 Mangoes. The number of ways a person make selection of fruits from the basket is

1) 209 2) 210 3) 211 4) 212

30. A class contains 4 boys and 'g' girls. Every Sunday five students, including at least three boys go for a picnic to Zoo Park, a different group being sent every week. During, the picnic, the class teacher gives each girl in the group a doll. If the total number of dolls distributed was 85, then value of 'g' is

1) 15 2) 12 3) 8 4) 5

31. The number of ways in which 52 cards can be divided into 4 sets of 13 each is

1) $\frac{52!}{(13!)^4}$ 2) $\frac{52!}{4!(13!)^4}$ 3) $\frac{52!}{4^{13}}$ 4) $\frac{52!}{13!4^{13}}$

32. $\frac{7}{5}\left(1+\frac{1}{10^2}+\frac{1.3}{1.2}.\frac{1}{10^4}+\frac{1.3.5}{1.2.3}.\frac{1}{10^6}+.....\infty\right)=$

1) $\sqrt{2}$ 2) $2\sqrt{2}$ 3) $2^{1/3}$ 4) $\sqrt{\frac{2}{3}}$

33. Coefficient of x^2 in the expansion of $\left(1+3x-2x^3\right)^{10}$

1) 62640 2) 64620 3) 65640 4) 62330

34. Coefficient of x^4 in the expansion of $\frac{1}{(x+1)(x+2)}$

1) $\frac{1}{32}$ 2) $\frac{11}{32}$ 3) $\frac{21}{32}$ 4) $\frac{31}{32}$

35. The mean of two samples of sizes 200 and 300 were found to be 25, 10 respectively. Their standard deviations were 3 and 4 respectively. The variance of combined sample of size 500 is

1) 64 2) 65.2 3) 67.2 4) 64.2

36. Suppose a population A has 100 observations 101,102……, 200 and another population B has 100 observations 151, 152, ……. 250. If V_A and V_B represent the variances of the two populations, respectively, then V_A/V_B is

1) 1 2) $9/4$ 3) $4/9$ 4) $2/3$

37. If the letters of word 'PROBABILITY' are arranged at random. The probability that

1) relative position of vowels and consonants remains unaltered.

2) the order of vowels remains the same.

3) the order of vowels and consonants remains the same in the same order is

1) $\frac{4!7!}{11!}, \frac{1}{12}, \frac{(2!2!)}{(4!7!)}$ 2) $\frac{4!7!}{11!}, \frac{1}{11}, \frac{(2!2!)}{(4!7!)}$

3) $\frac{4!7!}{11!}, \frac{1}{10}, \frac{(2!2!)}{(4!7!)}$ 4) $\frac{4!7!}{11!}, \frac{1}{21}, \frac{(2!2!)}{(4!7!)}$

38. Let S be the sample space of the random experiment of throwing simultaneously two unbiased dice with six faces (number 1 to 6) and let $E_k = \{(a,b) \in S : ab = k\}$ for $k \geq 1$. If $p_k = P(E_k)$ for $k \geq 1$ then correct among the following, is

1) $p_1 < p_{30} < p_4 < p_6$ 2) $p_{36} < p_6 < p_2 < p_4$

3) $p_1 < p_{11} < p_4 < p_6$ 4) $p_{36} < p_{11} < p_6 < p_4$

39. E_1, E_2 are events of a sample space such that

$P(E_1) = \frac{1}{4}, P\left(\frac{E_2}{E_1}\right) = \frac{1}{2}, P\left(\frac{E_1}{E_2}\right) = \frac{1}{4}, Then\ P\left(\frac{\overline{E_1}}{E_2}\right) =$

1) $\frac{1}{3}$ 2) $\frac{1}{4}$ 3) $\frac{2}{3}$ 4) $\frac{3}{4}$

40. In a business venture a man can make a or profit of Rs. 2000/- with probability of 0.4 or have loss of Rs. 1000/- with probability 0.6. His expected profit is

1) Rs. 800 2) Rs. 600 3) Rs. 200 4) Rs. 400

41. The vertices of a triangle are $\left(1, \sqrt{3}\right)$, $\left(2\cos\theta, \sin\theta\right)$ and $\left(2\sin\theta, -2\cos\theta\right)$ where $\theta \in R$. The locus of orthocenter of the triangle is

1) $(x-1)^2 + \left(y-\sqrt{3}\right)^2 = 4$ 2) $(x-2)^2 + \left(y-\sqrt{3}\right)^2 = 4$

3) $(x-1)^2 + \left(y-\sqrt{3}\right)^2 = 8$ 4) $(x-2)^2 + \left(y-\sqrt{3}\right)^2 = 8$

42. If the square ABCD where $A(0,0), B(2,0), C(2,2)$ and $D(0,2)$ undergoes the following three transformations successively

i) $f_1(x,y) \to (y,x)$ ii) $f_2(x,y) \to (x+3y, y)$ iii) $f_3(x,y) \to \left(\frac{x-y}{2}, \frac{x+y}{2}\right)$

then the final figure is:

1) square 2) parallelogram 3) rhombus 4) rectangle

43. The acute angle bisector between the lines $3x-4y-5=0, 5x+12y-26=0$ is

1) $7x-56y+32=0$ 2) $9x-3y+13=0$ 3) $14x-112y+65=0$ 4) $7x-13y+9=0$

44. The line joining the points $A(3,0)$ and $B(5,2)$ is rotated about A in the anticlockwise direction through an angle of 15^0. If B goes to C in the new position now the line joining A and C is rotated about A in the anticlockwise direction through an angle of 45^0 of C goes to D in the new position, then the coordinates of D are

1) $\left(4-\sqrt{3}, \sqrt{3}-1\right)$ 2) $\left(4+\sqrt{3}, \sqrt{3}-1\right)$ 3) $\left(4-\sqrt{3}, \sqrt{3}+1\right)$ 4) $\left(4+\sqrt{3}, \sqrt{3}+1\right)$

45. If $4a^2 + 9b^2 - c^2 + 12ab = 0$ then the family of straight lines $ax+by+c=0$ is concurrent at

1) $(2,3)$ or $(-2,-3)$ 2) $(2,-3)$ or $(-2,6)$ 3) $(-2,-4)$ or $(-2,3)$ 4) $(2,5)$ or $(-1,-5)$

46. In a ΔABC the mid points of the sides AB, BC, CA are respectively $(l,0,0), (0,m,0)$ and $(0,0,n)$. Then $\frac{AB^2 + BC^2 + CA^2}{l^2 + m^2 + n^2} =$

1) 2 2) 4 3) 8 4) 16

47. The angle between the diagonals of the parallelogram formed by the points $(1,2,3), (-1,-2,-1), (2,3,2), (4,7,6)$ is

1) $\cos^{-1}(7)$ 2) $\cos^{-1}\left(\frac{7}{\sqrt{155}}\right)$ 3) $\cos^{-1}\left(\frac{7}{\sqrt{465}}\right)$ 4) $\cos^{-1}\left(\frac{7}{465}\right)$

48. A variable plane intersects the coordinate 'p' from O (0,0,0). Then the locus of the centroid of the tetrahedron OABC is

1) $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{1}{p^2}$ 2) $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{4}{p^2}$

3) $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=\frac{16}{p^2}$ 4) $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=16p^2$

49. $\lim_{x\to 2^+}\left(\frac{[x]^3}{3}-\left[\frac{x}{3}\right]^3\right)^x$ is (where [ ] is GIF)

1) 0 2) $\frac{64}{27}$ 3) $\frac{8}{3}$ 4) $\frac{10}{3}$

50. $\lim_{x\to\infty}\left(\frac{a^{1/x}+b^{1/x}+c^{1/x}}{3}\right)^x=$ (where a, b, c are real and non – zero)

1) 0 2) $(abc)^{1/3}$ 3) $(abc)^{-1/3}$ 4) 1

51. Let $f:R\to R$ be defined by $f(x)=\begin{cases}\alpha+\frac{\sin[x]}{x} & ,if \quad x>0\\ 2 & ,if \quad x=0\\ \beta+\left[\frac{\sin x-x}{x^3}\right] & ,if \quad x<0\end{cases}$ where [x] denotes the integral part of x. If f continuous $x=0$, then $\beta-\alpha=$

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

52. Let $f(x)=a\sin|x|+be^{|x|}$ is differentiable when

1) $a=-b$ 2) $a=b$ 3) $a=0$ 4) $b=0$

53. If $\frac{d}{dx}\left(\frac{1+x^2+x^4}{1+x+x^2}\right)=ax+b,$ then $(a,b)=$

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

54. Let $f(x)=\begin{vmatrix}\cos x & x & 1\\ 2\sin x & x^2 & 2x\\ \tan x & x & 1\end{vmatrix}$ then $\lim_{x\to 0}\frac{f^1(x)}{x}=$

1) 2 2) -2 3) -1 4) 1

55. The focal length of a mirror is given by $\frac{1}{v}-\frac{1}{u}=\frac{2}{f}$. If equal errors α are made in measuring u and v. then relative error in f is

1) $\frac{2}{\alpha}$ 2) $\alpha\left(\frac{1}{u}+\frac{1}{v}\right)$ 3) $\alpha\left(\frac{1}{u}-\frac{1}{v}\right)$ 4) $\frac{3}{\alpha}$

56. A point 'P' is moving with constant velocity V along a line AB. O is a point on the line perpendicular to AB at A and at a distance $"l"$ from A. The angular velocity of P about O is

1) $\frac{lv}{op}$ 2) $\frac{lv}{op^2}$ 3) $\frac{lv^2}{op}$ 4) $\frac{op^2}{lv}$

57. Length of the normal to the curve at any point on the curve $y=\frac{a\left(e^{x/a}+e^{-x/a}\right)}{2}$ varies as

1) x 2) x^2 3) y 4) y^2

58. Let $h(x)=f(x)-[f(x)]^2+[f(x)]^3$ for every real number x then

1) h is increasing whenever f is increasing
2) h is increasing whenever f is decreasing
3) h is decreasing whenever f is increasing
4) Nothing can be said in general

59. If $-4\le x\le 4$ then critical points of $f(x)=x^2-6|x|+4$ are

1) $3,-2$ 2) $6,-6$ 3) $3,-3,0$ 4) $0,1,3$

60. The value of θ in the Lagrange's mean value theorem for $f(x)=x^3, a=1, h=1/2$ is

1) $\frac{1}{3}$ 2) $\sqrt{\frac{19}{56}}$ 3) $\sqrt{\frac{19}{3}}+2$ 4) $\sqrt{\frac{19}{3}}-2$

61. The least distance of the line $8x-4y+73=0$ from the circle $16x^2+16y^2+48x-8y-43=0$

1) $\sqrt{5}/2$ 2) $2\sqrt{5}$ 3) $3\sqrt{5}$ 4) $4\sqrt{5}$

62. If $(1,1),(k,2)$ are conjugate points with respect to the circle $x^2+y^2+8x+2y+3=0$, then k =

1) -12 2) $-12/7$ 3) $-12/5$ 4) -4

63. The center of the circle circumscribing the square whose three sides are $3x+y=22, x-3y=14$ and $3x+y=62$ is

1) $\left(\frac{3}{2},\frac{27}{2}\right)$ 2) $(16,-6)$ 3) $(27,3)$ 4) $\left(1,\frac{2}{3}\right)$

64. The lengths of the tangent drawn from any point on the circle $15x^2+15y^2-48x+64y=0$ to the two circles $5x^2+5y^2-24x+32y+75=0$ and $5x^2+5y^2-48x+64y+300=0$ are in the ratio of

1) $1:2$ 2) $2:3$ 3) $3:4$ 4) $4:5$

65. Two circles of radii r and R intersect at an acute angle θ. The length of their common chord is

1) $\frac{2rR\sin\theta}{\sqrt{r^2+R^2-2rR\cos\theta}}$ 2) $\frac{2rR\sin\theta}{\sqrt{r^2+R^2}}$ 3) $\frac{2rR\sin\theta}{\sqrt{R^2-r^2}}$ 4) $\frac{2rR\sin\theta}{\sqrt{r^2+R^2+2rR\cos\theta}}$

66. If the join of ends of the latusrectum of $x^2=8y$ subtends an angle θ at the vertex of the parabola then $\cos\theta=$

1) $\frac{-4}{5}$ 2) $\frac{-2}{3}$ 3) $\frac{-3}{5}$ 4) $\frac{-1}{5}$

67. The focus of a parabola is $(1,2)$ and the point of intersection of the directrix and axis is $(2,3)$. Then the equation of the parabola is

1) $(x-1)^2+(y-2)^2=\frac{1}{4}(x+y-5)^2$ 2) $(x-1)^2+(y-2)^2=\frac{1}{2}(x+y-5)^2$

3) $(x-1)^2+(y-2)^2=\frac{1}{5}(x+y-5)^2$ 4) $(x-1)^2+(y-2)^2=\frac{1}{25}(x+y-5)^2$

68. The eccentricity of the conic represented by $\sqrt{(x+2)^2+y^2}+\sqrt{(x-2)^2+y^2}=8$ is

1) $1/3$ 2) $1/2$ 3) $1/4$ 4) $1/5$

69. A bridge is in the shape of a semi ellipse it is 400mts long and has a maximum height 10mts at the middle point. The height of the bridge at a point distant 80mts. from one end is

1) 4mts 2) 2mts 3) 8mts 4) 6mts

70. Let the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{7}=1$ and the hyperbola $\frac{x^2}{144}-\frac{y^2}{\alpha}=\frac{1}{25}$ coincide. Then the length of the latus rectum of the hyperbola is

1) $\frac{32}{9}$ 2) $\frac{18}{5}$ 3) $\frac{27}{4}$ 4) $\frac{27}{10}$

71. If $\int\frac{\sin 2x}{a^2\cos^2 x+b^2\sin^2 x}dx=k.\log|a^2\cos^2 x+b^2\sin^2 x|+c$, then $k=$

1) $\frac{1}{b^2-a^2}$ 2) $\frac{1}{\left(b^2-a^2\right)^2}$ 3) $\frac{1}{a^2-b^2}$ 4) $\frac{1}{a^2+b^2}$

72. If $\int \frac{1}{\sqrt{x^2+x+1}}dx = a\sinh^{-1}(bx+c)+d$, then descending order of a,b,c is

1) a,b,c 2) b,c,a 3) b,a,c 4) c,a,b

73. $\int \frac{\sin^2 x.\sec^2 x+2\tan x.\sin^{-1} x.\sqrt{1-x^2}}{\sqrt{1-x^2}(1+\tan^2 x)}dx =$

1) $\left(\cos^2 x\right).\left(\sin^{-1} x\right)+c$ 2) $\left(\sin^2 x\right).\left(\sin^{-1} x\right)+c$

3) $\left(\sec^2 x\right).\left(\cos^{-1} x\right)+c$ 4) $\left(\sec^2 x\right).\left(\tan^{-1} x\right)+c$

74. $\int\left(1+x-x^{-1}\right)e^{x+x^{-1}}dx =$

1) $(x+1)e^{x+x^{-1}}+c$ 2) $(x-1)e^{x+x^{-1}}+c$ 3) $-xe^{x+x^{-1}}+c$ 4) $xe^{x+x^{-1}}+c$

75. Statement – I: $f(x)=\int_1^x \frac{\log t dt}{1+t+t^2}(x>0)$ then $f(x)=-f\left(\frac{1}{x}\right)$

Statement – II: $f(x)=\int_1^x \frac{\log t dt}{1+t}$ then $f(x)+f\left(\frac{1}{x}\right)=\frac{1}{2}(\log x)^2$

1) Statement – I is true, Statement – II is true;
Statement – II is a correct explanation for Statement – I
2) 1) Statement – I is true, Statement – II is true;
Statement – II is NOT a correct explanation for Statement – I
3) Statement – I is True, Statement – II is False.
4) Statement – I is False, Statement – II is True.

76. $\int_1^{32} \frac{dx}{x^{1/5}\sqrt{1+x^{4/5}}}$

1) $\frac{2}{5}\left(\sqrt{17}+\sqrt{2}\right)$ 2) $\frac{2}{5}\left(\sqrt{17}-\sqrt{2}\right)$ 3) $\frac{5}{2}\left(\sqrt{17}-\sqrt{2}\right)$ 4) $\frac{5}{2}\left(\sqrt{17}+\sqrt{2}\right)$

77. Area of the region $\left\{(x,y)/x^2+y^2\le 1\le x+y\right\}$ **is**

1) $\frac{\pi}{4}+\frac{1}{2}$ 2) $\frac{\pi}{4}-\frac{1}{2}$ 3) $\frac{\pi}{4}+\frac{3}{4}$ 4) $\pi+1$

78. The differential equation representing the family curves $y^2=2c\left(x+\sqrt{c}\right)$ when 'c' is a parameter is of

1) degree 4 2) order 2 3) degree 3 4) degree 1

79. The solution to the D.E $\frac{xdx}{x^2+y^2}=\left(\frac{y}{x^2+y^2}-1\right)dx$ is

1) $y=x\cos t(c-x)$ 2) $\cos^{-1}\left(\frac{y}{x}\right)=-x+c$ 3) $y=x\tan(c-x)$ 4) $\frac{y^2}{x^2}=x\tan(c-x)$

80. At present a firm is manufacturing 2000 items. It is estimated that the rate of change of production P wrt additional number of workers x is given by $\frac{dp}{dx}=100-12\sqrt{x}$. If the firm employees 25 more workers, then the new level of production of items is

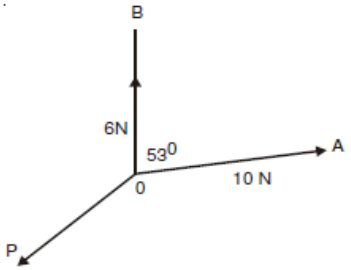
1) 2500 2) 3000 3) 3500 4) 4000

PHYSICS

81. The Richardson equation is given by $I=AT^2e^{(-B/KT)}$. The dimensional formula for AB^2 is same as that for (A *and* B *are* constant)

1) IT^{-2} 2) $k\ T$ 3) Ik^2 4) Ik^2/T

82. If the system is in equilibrium ($\cos 53^\circ = 3/5$), then the value of ′ P ′ is



1) 16N 2) 4N 3) $\sqrt{208}N$ 4) $\sqrt{232}N$

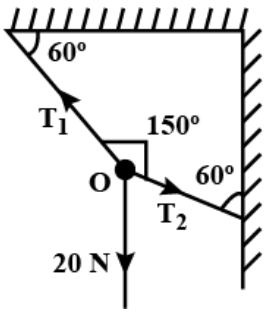
83. A body is thrown up in a lift with an upward velocity u relative to the lift from its floor and the time of flight is found to be t. The acceleration of the lift will be

1) $\frac{u-gt}{2}$ 2) $\frac{u+gt}{2}$ 3) $\frac{2u-gt}{t}$ 4) $\frac{u}{t}-g$

84. A ball is thrown with a velocity u making an angle 'θ' with the horizontal. Its velocity vector will be normal to its initial velocity (u) after a time interval of

1) $\frac{u\sin\theta}{g}$ 2) $\frac{u}{g\cos\theta}$ 3) $\frac{u}{g\sin\theta}$ 4) $\frac{u\cos\theta}{g}$

85. If ′O′ is at equilibrium then the values of the tension T_1 and T_2 respectively.



1) 20N,30N 2) $20\sqrt{3}N, 20N$ 3) $20\sqrt{3}N, 20\sqrt{3}N$ 4) $10N, 30N$

86. A body is moving down a long inclined plane of angle of inclination θ.the coefficient of friction between the body and the plane varies as $\mu = 0.5x$, where x is the distance moved down the plane. The body will have the maximum velocity when

1) $x = 2\tan\theta$ 2) $x = \frac{2}{\tan\theta}$ 3) $x = \sqrt{2}\cot\theta$ 4) $x = \frac{\sqrt{2}}{\cot\theta}$

87. The PE of a 2 kg particle, free to move along x-axis is given by $V(X) = \left(\frac{X^3}{3} - \frac{X^2}{2}\right)J$. The total mechanical energy of the particle is 4 J. Maximum speed of particle (in ms^{-1}) is

1) $\frac{1}{\sqrt{2}}$ 2) $\sqrt{2}$ 3) $\frac{3}{\sqrt{2}}$ 4) $\frac{5}{\sqrt{6}}$

88. A tennis ball bounces down a flight of stairs, striking each step in turn and rebounding to the half of height of the step. The coefficient of restitution is

1) $\frac{1}{2}$ 2) $\frac{1}{\sqrt{2}}$ 3) $\left(\frac{1}{\sqrt{2}}\right)^{1/2}$ 4) $\left(\frac{1}{\sqrt{2}}\right)^{1/4}$

89. The radius of a solid sphere is R and its density D. When it is made to rotate about an axis passing through any diameter of sphere, then the expression for its moment of inertia is

1) $\frac{8}{7}\pi DR^5$ 2) $\frac{8}{15}\pi DR^5$ 3) $\frac{28}{15}\pi DR^5$ 4) $\frac{28}{5}\pi DR^5$

90. The coefficient of linear expansion of an inhomogeneous rod change linearly from α_1 to α_2 from one end to the other end of the rod. The effective coefficients of linear expansion of rod is

1) $\alpha_1+\alpha_2$ 2) $\frac{\alpha_1+\alpha_2}{2}$ 3) $\sqrt{\alpha_1\alpha_2}$ 4) $\alpha_1-\alpha_2$

91. In two vessels of same volume, atomic hydrogen and helium at pressure 1 atm and 2 atm are filled. If the temperature of both the samples is same, then average speed of hydrogen atom (C_H) will be related to helium (C_{He}) as

1) $C_H=\sqrt{2}C_{He}$ 2) $C_H=C_{He}$ 3) $C_H=2C_{He}$ 4) $C_H=\frac{C_{He}}{2}$

92. The heat energy required to vapourise 5kg of water at 373 K is

1) 2700 kcal 2) 1000 kcal 3) 27 kcal 4) 270 kcal

93. A man of 60 kg gains 1000 cal of heat by eating 5 mangoes. His efficiency is 56%. The height to which he can jump by using this energy is $g=9.8m/s^2, J=4.2J/cal$

1) 4m 2) 20 m 3) 28 m 4) 0.2 m

94. Three rods A, B and C have the same dimensions. Their thermal conductivities K_A, K_B and K_C respectively. A and B are placed end to end, with the free ends kept at a certain temperature difference. C is placed separately with its ends kept at same temperature difference. The two arrangements conduct heat at the same rate K_C must be equal to

1) K_A+K_B 2) $\frac{K_A+K_B}{K_AK_B}$ 3) $\frac{1}{2}(K_A+K_B)$ 4) $\frac{K_AK_B}{K_A+K_B}$

95. Mass M = 1 unit is divided into two parts X and (1 - X). For a given separation the value of X for which the gravitational force between them becomes maximum is

1) $1/2$ 2) $3/5$ 3)1 4) 2

96. A simple pendulum of length l is connected to the ceiling of a vehicle that is moving down along a smooth inclined plane 4 in 5. then its period of oscillation is

1) $2\pi\sqrt{\frac{5l}{4g}}$ 2) $2\pi\sqrt{\frac{4l}{5g}}$ 3) $2\pi\sqrt{\frac{5l}{3g}}$ 4) $2\pi\sqrt{\frac{3l}{5g}}$

97. An aluminium wire and a steel wire of the same length and cross-section are joined end to end. The composite wire is hung from a rigid support and a load is suspended from the free end. If the increase in the length of the composite wire is 2.7 mm, then the increase in the length of each wire is {in mm).

1) 1.7,1 2) 1.3,1.4 3) 1.5,1.2 4) 2.1,0.6

98. The excess pressure inside a spherical soap bubble of radius 1 cm is balanced by a column of oil (specific gravity =0.8),2 mm high, the surface tension of the bubble is

1) $3.92N/m$ 2) $0.0392N/m$ 3) $0.392N/m$ 4) $0.00392N/m$

99. A tuning fork produces 6 beats/sec with sonometer wire when its tensions are either 169N or 196N. The frequency of that fork is

1) 162 Hz 2) 190 Hz 3) 200 Hz 4) 80 Hz

100. A ray reflected successively from two plane mirrors inclined at a certain angle undergoes a deviation of 300^0. The number of observable images

1) 60 2) 12 3) 11 4) 5

101. An equiconvex lens is cut into two equal parts along a plane perpendicular to the principal axis. If the power of the original lens is 4D, the power of one of the two parts is

1) 2D 2) 3D 3) 4D 4) 5D

102. In Young's double slit experiment, the 8th maximum with wavelength λ_1 is at a distance d_1 from the central maximum and the 6th maximum with wavelength λ_2 is at a distance d_2 .from central maximum Then (d_1/d_2) is equal to

1) $\frac{4}{3}\left(\frac{\lambda_2}{\lambda_1}\right)$ 2) $\frac{4}{3}\left(\frac{\lambda_1}{\lambda_2}\right)$ 3) $\frac{3}{4}\left(\frac{\lambda_2}{\lambda_1}\right)$ 4) $\frac{3}{4}\left(\frac{\lambda_1}{\lambda_2}\right)$

103. An electric field is expressed as $\vec{E} = 2\hat{i} + 3j$. the potential difference $(V_A - V_B)$ between two points A and B whose position vectors are given $r_A = \hat{i} + 2j$ and $r_B = 2\hat{i} + j + 3k$ is---V

1) -1 2) -2 3) $+1$ 4) $+2$

104. Two thin infinite parallel sheets (conducting) have charged uniformly and surface densities are $+\sigma$ and $-\sigma$ after negative charge plate is grounded. Electric field in the space between the two sheets is

1) $\sigma/\in_0$ 2) $\sigma/2\in_0$ 3) $2\sigma/\in_0$ 4) Zero

105. He capacity of a parallel plate condenser with air medium is 60μF having distance of separation d. If the space between the plates is filled with two slabs each of thickness d/2 and dielectric constants 4 and 8, the effective capacity becomes is $n \times 40\mu F$ Find n

1) 8 2) 10 3) 12 4) 14

106. Find the value of colour coded resistance shown in fig

1) $520 \pm 10\%$ 2) $5200 \pm 10\%$ 3) $52000 \pm 10\%$ 4) $52000 \pm 1\%$

107. Two electric bulbs rated P_1 watt and V volt, P_2 watt and V volt are connected in series, Across V-volt supply. the total power consumed is

1) $\frac{P_1 + P_2}{2}$ 2) $\sqrt{P_1.P_2}$ 3) $\frac{P_1.P_2}{P_1 + P_2}$ 4) $(P_1 + P_2)$

108. The magnetic field $\overline{dB}$ due to a small current element $\overline{dl}$ at a distance $\vec{r}$ and carrying current 'i' is

1) $\overline{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overline{dl} \times \vec{r}}{r} \right)$ 2) $\overline{dB} = \frac{\mu_0}{4\pi} i^2 \left(\frac{\overline{dl} \times \vec{r}}{r^2} \right)$

3) $\overline{dB} = \frac{\mu_0}{4\pi} i^2 \left(\frac{\overline{dl} \times \vec{r}}{r} \right)$ 4) $\overline{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overline{dl} \times \vec{r}}{r^3} \right)$

109. A proton enters a magnetic field with a velocity of $2.5X10^7 ms^{-1}$ making an angle 30° with the magnetic field. The force on the proton is $(B = 25T)$

1) $1.25X10^{-11} N$ 2) $2.5X10^{-11} N$ 3) $5.0X10^{-11} N$ 4) $7.5X10^{-11} N$

110. In which of the following cases the emf is induced due to time varying magnetic fled (induced field emf)?
Case I A magnet is moving along the axis of a conducting coil
Case II A loop having varying area (due to moving jumper) is placed in a magnetic field
case III The resistance of the coil is changing, which is connected to an ideal battery.
case IV a current carrying wire is approaching a conducting ring

1) I,II and III only 2) I,III and IV only 3) I,II and IV only 4) All the four

111. In R-L-C series circuit, we have same current at angular frequencies ω_1 and ω_2 The resonant frequency of circuit is

1) $\frac{\omega_1^2}{\omega_2}$ 2) $\frac{\omega_2^2}{\omega_1}$ 3) $\sqrt{\omega_1 \omega_2}$ 4) $\omega_1 + \omega_2$

112. The relative permeability of glass is 3/8 and the dielectric constant of glass is 8. The refractive index of glass is

1) 1.732 2) 1.327 3) 1.682 4) 2.582

113. In Davisson and Germar experiment, the intensity of the scattered beam of electrons is maximum for diffraction angle 50° at 54V potential difference with nickel crystal Then de-Broglie wavelength of electron is (approximately)

1) 1.67 A^0 2) 2 A^0 3)1 A^0 4) 0.2 A^0

114. What is the minimum energy that must be given to a H atom in ground state so that it can emit an H_γ line in Balmer series.

1) 10.2 eV 2) 12.1 eV 3) 2.85 eV 4) 13.6 eV

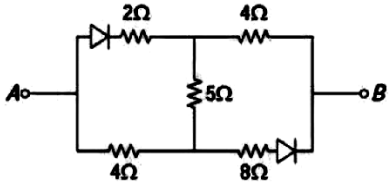
115. After a certain lapse of time, the fraction of radioactive polonium undecayed is found to be 12.5% of initial quantity. The duration of this time lapse is (if the half-life of polonium is 138 days)

1) 414days 2) 407 days 3) 421 days 4) 410 days

116. At a temperature of $30^\circ C$, the susceptibility of a ferromagnetic material is found to be 'χ'. its susceptibility at $333^\circ C$ is

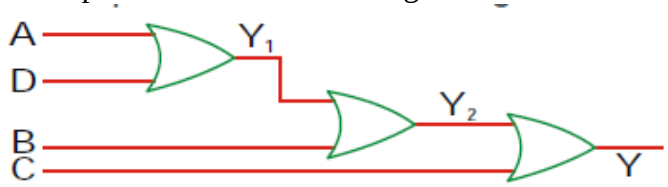
1) χ 2) $\frac{\chi}{2}$ 3) 2χ 4) 11.1χ

117. The equivalent resistance of the circuit across AB is given by



1) 4Ω 2) 13Ω 3) 4Ω *or* 13Ω 4) 4Ω *zero*

118. The expression of Y in following circuit is



1) $ABCD$ 2) $A+BCD$ 3) $A+B+C+D$ 4) $AB+CD$

119. Digital signals
(i) do not provide a continuous set of values
(ii) represent values as discrete steps
(iii) can utilize binary system
(iv) can utilize decimal as well as binary systems
The true option is.

1) (I)&(II) only 2) (II)&(III) only
3) (I), (II)&(III) only 4) (I), (II), (III) & (IV)

120. The separation L between the objective $(f_0 = 0.5cm)$ and the eye piece $(f_e = 5cm)$ of a compound microscope is 7cm. Where should a small object be placed, so that the eye is least strained?

1) 0.5 cm 2) $\frac{3}{2}cm$ 3) $\frac{2}{3}cm$ 4) $\frac{1}{3}cm$

CHEMISTRY

121. The minimum number of quantum numbers required to specify an orbital in an atom is

1) 1 2) 4 3) 2 4) 3

122. The set of species having only fractional bond order values is

1) C_2^{2-}, N_2, O_2^{2-} 2) O_2^+, O_2^-, N_2^+ 3) O_2^{2+}, O_2, C_2^{2-} 4) Li_2, H_2^+, C_2

123. The increasing order of acidic strength among the following compounds

I. Benzoic acid II. 4–Nitrobenzoic acid
III. 3,4–Dintrobenzoic acid IV. 4–Methoxybenzoic acid

1) $I < II < III < IV$ 2) $I < IV < II < III$
3) $IV < I < II < III$ 4) $IV < I < III < II$

124. Which of the following outer octahedral complexes have same number of unpaired electrons?

A. $[MnCl_6]^{3-}$ B. $[FeF_6]^{-3}$ C. $[CoF_6]^{3-}$ D. $[Ni(NH_3)_6]^{2+}$

1) A, C 2) A, B 3) B, C 4) A, D

125. The set with only ambidentate ligands in the following

1) NO_3, Br, C_2O_4 2) NO_2, CN, SCN 3) NO_2, C_2O_4, NH_3 4) SCN , CO, NH_3

126. $KMnO_4$ oxidises $S_2O_3^{2-}$ to SO_4^{2-} in medium x and NO_3^- in medium y, x and y are respectively.

1) Acidic, basic 2) Acidic, Acidic 3) Acidic, neutral 4) Neutral, acidic

127. Which one of the following reactions does not take place?

1) $2CuSO_4(aq) + 4KI\ (aq) 2CuI_2 + 2K_2SO_4$

2) $2CuSO_4(aq) + 4KCI\ (aq) 2CuCl_2 + 2K_2SO_4$

3) $CuSO_4(aq) + Zn\ (aq) ZnSO_4(aq) + Cu\ (s)$

4) $2CuSO_4(aq) + 4KF\ (aq) 2CuF_2 + 2K_2SO_4$

128. The reduction potential of hydrogen electrode at 25^0C in a neutral solution is $\left(p_{H_2} = 1bar\right)$

1) $0.059V$ 2) $-0.059V$ 3) $-0.413V$ 4) $0.0V$

129. A commercial sample of H_2O_2 marked as 100 volume hydrogen peroxide means

1) $1ml$ of H_2O_2 will give 100 ml of O_2 at STP

2) $1L$ of H_2O_2 will give 100 ml of O_2 at STP

3) 1 1 of the H_2O_2 will give 22.4 ml of O_2 at STP

4) $1ml$ of H_2O_2 will give 1 mole of O_2 at STP

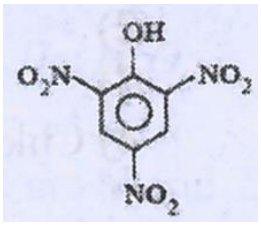
130. Observe the following solutions, how many of them are acidic

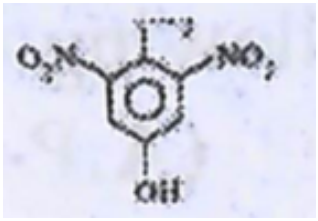
A. Black coffee B. $0.2M$ $NaOH$ C. Lemon juice

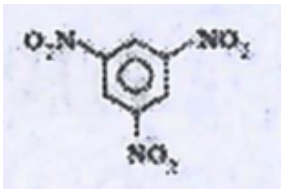
D. Lime water E. Human saliva F. Tomato juice

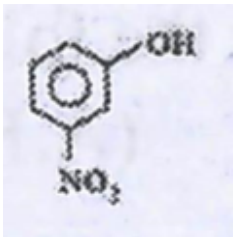
1) A, B, C 2) C, D, E, F 3) B, D only 4) A, C, E, F

131. An organic compound A (C_6H_7N) on reaction with $NaNO_2 / HCl$ at $273-278\,K$ followed by warming with water gave B. B reacts with conc. HNO_3 to give C. What is C?

1) 

2) 

3) 

4) 

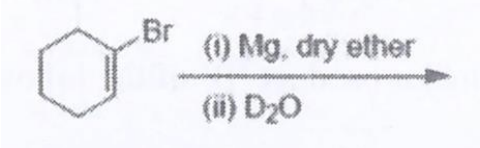
132. Geo metrical isomerism can be found in which of the following?

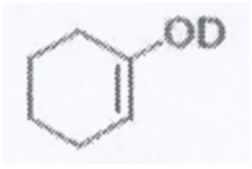
1) Butyric acid 2) Aspartic acid 3) Palmitic acid 4) Cinnamic acid

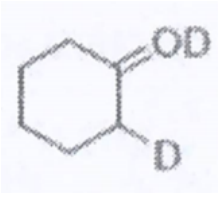
133. Steam distillation process cannot be used for purifying which of the following?

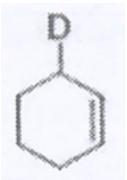
1) Aniline 2) p-nitrophenol 3) Toluene 4) Nitrobenzene

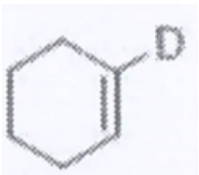
134. The major product of the following reaction is



1) 

2) 

3) 

4) 

135. Which of the following compounds do not have sp^3 carbon atom (s)?

I) Acetone II) Acetic III) Buta-1, 3-diene IV) Propyne V) Naphthalene

1) I,II only 2) II, III only 3) IV, V only 4) III, V only

136. Identify the ortho and para direction groups towards aromatic electrophilic substitution reactions from the following list

$-OH$	$-CN$	$-CO_2H$	$-OCH_3$	$-NHCOCH_3$	$-CHO$
I	II	III	IV	V	VI

1) I, IV, V 2) II, III, VI 3) I, II, IV 4) IV, V, VI

137. Choose the incorrect statement among the following

A. The reactivity of aromatic aldehydes and ketones is less that of aliphatic carbonyl compounds towards nucleophilic addition reactions

B. Benzaldehyde does not give Fehling's test.

C. The H atoms in ethanal are acidic in nature

D. " p – Nitro benzaldehyde' is less reactive than "benzaldehyde" towards nucleophilic addition reaction

1) A 2) B 3) C 4) D

138. In the given reactions, 'X' and 'Y' respectively are

$$C_6H_5CH_2NH_2 \xleftarrow{X} C_6H_5CONH_2 \xrightarrow{Y} C_6H_5NH_2$$

1) $LiA1H_4, H_2O$; Br_2 / OH

2) Br_2 / OH^-; $LiA1H_4, H_2O$

3) Br_2 / H^+; $NaBH_4$

4) $NaBH_4$; Br_2 / H^+

139. In which of the following pairs the polymer correctly matched with the forces possessed by them

A. Neoprene---- Weak intermolecular forces

B. Terylene---- Hydrogen bonding

C. Polystyrene---- Very weak intermolecular forces

D. Polythene---- Hydrogen bonding

1) B,C 2) C,D 3) A,B 4) A,D

140. Identify A and B form the following reaction

$$NaNO_3 \xrightarrow{\Delta} xA + yB$$

1) $NaNO_2, O_2$ 2) Na_2O, NO_2 3) Na_2O, NO 4) Na, NO_2

141. Energy levels A,B,C of a certain atoms corresponding to increasing values of energy level i.e., $E_A < E_B < E_C$. If λ_3 are the wavelengths of radiations corresponding to the transitions C to B, B to A and C to A respectively which of the following statement is correct?

1) $\lambda_3 = \lambda_1 + \lambda_2$ 2) $\lambda_3 = \dfrac{\lambda_1\lambda_2}{\lambda_1 + \lambda_2}$ 3) $\lambda_1 + \lambda_2 + \lambda_3 = 0$ 4) $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

142. In which of the following molecules / ions all the bonds not equal?

1) XeF_4 2) BF_4 3) SF_4 4) SiF_4

143. Which of the following contains maximum number of molecules

1) 4 gm of hydrogen 2) 22. 4 liters of oxygen at S.T.P.

3) Carbon Dioxide obtained by heating 1 mole of calcium carbonate 4) 4 gm of helium

144. Oxidation number of carbon in carbon suboxide (C_3O_2)

1) $\frac{+2}{3}$ 2) $\frac{+4}{3}$ 3) $+4$ 4) $\frac{-4}{3}$

145. Two vessels of equal volume contain separately equal amounts of H_2 and CH_4. If the first vessel is at $300K$ and second vessel is at $600K$, then the ratio of pressure inside them is

1) $1:2$ 2) $2:1$ 3) $4:1$ 4) $8:1$

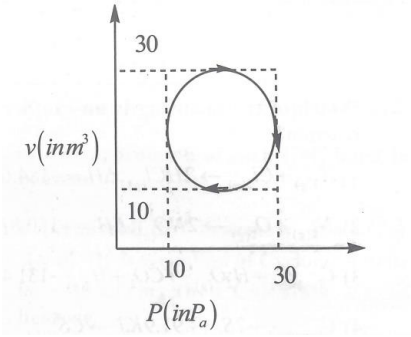
146. Oxygen is present in a flask of $1.12L$ capacity at a pressure of 7.6×10^{-10} mm of Hg at 0^0C. The number of oxygen molecules in the flask is

1) 1.5×10^{10} 2) 3×10^{12} 3) 3×10^{10} 4) 6×10^{12}

147. The work done is heating one mole of an ideal gas at constant pressure from 15^0C to 25^0C is

1) $+19.87cal$ 2) $-198.7cal$ 3) $+198.7cal$ 4) $-19.87cal$

148. A system works under cyclic process as follows.



Heat absorbed during the process is

1) $\frac{22}{7}\times10^2\,J$ 2) $\frac{22}{7}\times10^3\,J$ 3) $\frac{22}{7}\times10^4\,J$ 4) $\frac{22}{7}\times10^5\,J$

149. For the homogeneous reaction $4NH_{3_{(g)}}+5O_{2_{(g)}}$ $4NO_{(g)}+6H_2O_{(g)}$ the equilibrium constant K_c has the unit of

1) $(Conc)^{-1}$ 2) $Conc$ 3) $(Conc)^{+10}$ 4) It is dimensionless

150. The pH of a solution at 25^0C is 2. If its pH is to be changed to 4, then conc. of H^+ of the original has to be

1) Doubled 2) Halved 3) Increased by 100 times 4) Decreased by 100 times

151. When CO_2 is passed into brine solution saturated with ammonia we get

1) NH_HHCO_3 2) $(NH_4)_2CO_3$ 3) $NaHCO_3$ 4) Na_2CO_3

152. Which of the following is/are correct?

1) Al_2O_3 reacts with CaO but not with SiO_2

2) Thermal stability of carbonates; $BeCO_3 > MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

3) Solubility of sulphates: $BeSO_4 > MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$

4) $BeCl_2$ fors acidic solution in water while $BaCl_2$ forms neutral solution.

153. $H_3BO_3 \xrightarrow{375K} A \xrightarrow{Red\ Heat} B_2O_3$

$H_3BO_3 \xrightarrow{435K} A \xrightarrow{Red\ Heat} B_2O_3$

The compounds A & B are

1) Orthoboric acid, metaboric acid 2) Metaboric acid, Tetra boric acid

3) Tetra boric acid, Metaboric acid 4) Tetra boric acid, orthoboric acid

154. The element that liberates H_2 gas with steam

1) C 2) Si 3) Sn 4) Ge

155. In which of the following reactions, H_2O_2 acts as a reducing reagent?

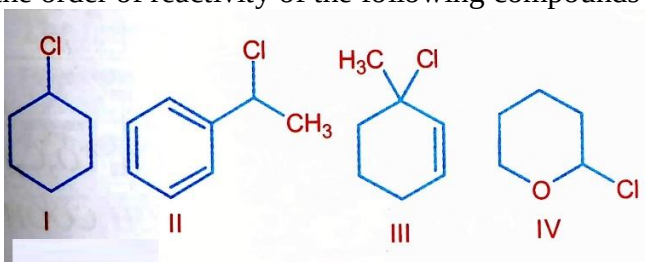
1) $PbO_{2(s)}+H_2O_{2(aq)} \rightarrow PbO_{(s)}+H_2O_{(l)}+O_{2(g)}$

2) $Na_2SO_{3(ag)}+H_2O_{2(aq)}+ \rightarrow Na_2SO_{4(aq)}+H_2O_{(l)}$

3) $2KI_{(aq)}+H_2O_{2(aq)} \rightarrow 2KOH_{(aq)}+I_{2(s)}$

4) All the above

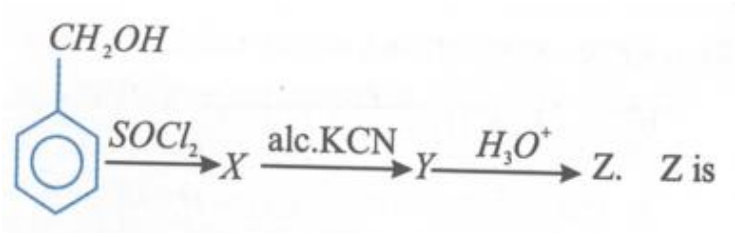
156. What is the order of reactivity of the following compounds towards very dilute aqueous



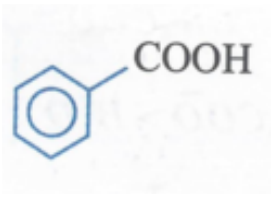
NaOH ?

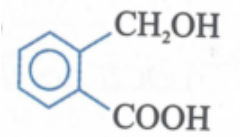
1) $I < III < II < IV$ 2) $II < I < III < IV$ 3) $IV < II < III < I$ 4) $III < II < I < IV$

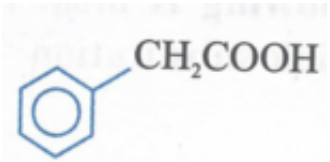
157.

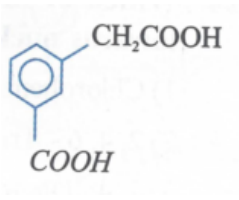


Z is

1) 

2) 

3) 

4) 

158. $CH_3CH_2CH_2OH + PBr_3 \rightarrow A$

$CH_3CH_2CH_2OH + Na \rightarrow B, \quad A + B \rightarrow C$. Product 'C' is

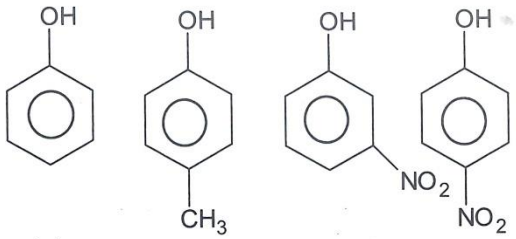
1) $(CH_3CH_2CH_2)_2O$ 2) $CH_3 - CH = CH_2$ 3) both 1 & 2 4) $(CH_3CH_2)_2O$

159. $C_6H_5 - O - CH_3 + HI_{(excess)} \rightarrow$

1) CH_3OH and C_6H_5I 2) CH_3I and C_6H_5OH

3) CH_3I and C_6H_5I 4) C_6H_6 and CH_4

160. In the following compounds, the decreasing order of acidity is



1) $I > IV > III > II$ 2) $II > IV > I > II$

3) $II > I > III > IV$ 4) $IV > III > I > II$

KEY SHEET

MATHS									
01	02	03	04	05	06	07	08	09	10
3	1	3	3	3	4	3	2	2	1
11	12	13	14	15	16	17	18	19	20
2	3	1	1	1	3	3	2	1	3
21	22	23	24	25	26	27	28	29	30
2	1	3	2	3	2	4	2	1	4
31	32	33	34	35	36	37	38	39	40
2	1	1	4	3	1	1	1	4	3
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
3	2	3	3	1	3	3	1	3	2
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
2	1	3	2	2	2	4	1	3	4
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
2	3	2	1	4	3	2	2	3	4
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
1	3	2	4	4	3	2	3	3	3
PHYSICS									
81	**82**	**83.**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
3	3	3	3	2	1	4	2	2	2
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
3	1	1	4	1	3	4	2	1	3
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**
1	2	1	1	1	3	3	4	3	2
111	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
3	1	1	3	1	2	3	3	3	3
CHEMISTRY									
121	122	123	124	125	126	127	128	129	130
4	2	3	1	2	4	1	3	1	4
131	132	133	134	135	136	137	138	139	140
1	4	2	4	4	1	4	1	3	1
141	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
2	3	1	2	3	3	4	3	2	4
151	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**
3	4	2	3	1	1	3	1	2	4