KGCET - 2K25

KSRM COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
KLM COLLEGE OF ENGINEERING FOR WOMEN, KADAPA
FOR ENGINEERING ASPIRANTS

EXAM DATE.: 01-05-2025 AN (2:00PM TO 5:00PM)

MATHS

1. If $f:R\to R$ *such that* $f(x+y)-kxy=f(x)+2y^2\ \forall x,y\in R$ *and* $f(1)=2$, $f(2)=8$ then $f(20)-f(10)=$

   1)600 2)300 3) 60 4)200

2. The maximum possible domain and the corresponding range for $f(x)=(-1)^x$ are

   1) $D_f=R, R_f=[-1,1]$ 2) $D_f=Z, R_f=\{-1,1\}$ 3) $D_f=Z, R_f=[-1,1]$ 4) $D_f=R, R_f=\{-1,1\}$

3. Sum of the series $S=1+\frac{1}{2}(1+2)+\frac{1}{3}(1+2+3)+\frac{1}{4}(1+2+3+4)....$*up to* 20 terms is

   1) 110 2) 111 3) 115 4)116

4. If $D=\begin{vmatrix}1 & 1 & 1\\ 1 & 1+x & 1\\ 1 & 1 & 1+y\end{vmatrix}$ *for* $x\neq 0, y\neq 0$ *then D is*

   1)divisible by neither x nor y 2) divisible by both x and y
   3) divisible x but not y 4) divisible by y but not x

5. Let P and Q be 3x3 matrices with $P\neq Q$. *If* $P^3=Q^3$ and $P^2Q=Q^2P$, then determinate of P^2+Q^2 is

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

6. If the system of equations $x=cy+bz, y=az+cx, z=bx+ay$ has a non -zero solutions then $a^2+b^2+c^2+2abc$ is

   1)0 2) 1 3) 2 4) 5

7. If $A=\begin{bmatrix}1 & -1\\ 2 & -1\end{bmatrix}, B=\begin{bmatrix}x & 1\\ y & -1\end{bmatrix}$ *and* $(A+B)^2=A^2+B^2$ then (x,y) is

   1) (1,4) 2)(2,1) 3) (3,3) 4) (0,1)

8. If I is the centre of a circle inscribed in a triangle ABC, then $|\overline{BC}|\overline{IA}+|\overline{CA}|\overline{IB}+|\overline{AB}|\overline{IC}$ is

   1) $\bar{0}$ 2) $\overline{IA}+\overline{IB}+\overline{IC}$ 3) $\frac{\overline{IA}+\overline{IB}+\overline{IC}}{3}$ 4) None

9. If $\bar{i}+2\bar{j}+3\bar{k}, 3\bar{i}+2\bar{j}+\bar{k}$ are sides of a parallelogram, then a unit vector parallel to one of the diagonals of a parallelogram is

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

10. The angle between the lines $\bar{r}=(2\bar{i}-3\bar{j}+\bar{k})+\lambda(\bar{i}+4\bar{j}+3\bar{k})$ *and* $\bar{r}=(\bar{i}-\bar{j}+2\bar{k})+\mu(\bar{i}+2\bar{j}-3\bar{k})$ is

    1) $\cos^{-1}\left(\frac{9}{\sqrt{91}}\right)$ 2) $\cos^{-1}\left(\frac{7}{\sqrt{84}}\right)$ 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{2}$

11. The perpendicular distance from $A(1,4,-2)$ to the line BC, where $B(2,1,-2)$ and $C(0,-5,1)$ is

    1) $\frac{\sqrt{26}}{7}$ 2) $\sqrt{\frac{26}{7}}$ 3) $\frac{2\sqrt{26}}{7}$ 4) $\frac{3\sqrt{26}}{7}$

12. Let $\bar{a},\bar{b},and\ \bar{c}$ be non zero vectors such that $\left(\bar{a}\times\bar{b}\right)\times\bar{c}=\frac{1}{3}\left|\bar{b}\right|\left|\bar{c}\right|\bar{a}$. If θ is the acute angle between the vectors $\bar{b}\ and\ \bar{c}$, then $\sin\theta$ is

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

13. $\bar{a}.\overline{a^1}+b.\overline{b^1}+c.\overline{c^1}$ is

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

14. If $0<\alpha,\beta<\frac{\pi}{4},\cos(\alpha+\beta)=\frac{4}{5},\sin(\alpha-\beta)=\frac{5}{13},$ then $\tan 2\alpha$ is

1) $\frac{33}{56}$ 2) $\frac{56}{33}$ 3) $\frac{16}{63}$ 4) $\frac{63}{16}$

15. $\tan^6\frac{\pi}{9}-33\tan^4\frac{\pi}{9}+27\tan^2\frac{\pi}{9}$ is

1)Tan$\frac{\pi}{3}$ 2) $\tan^2\frac{\pi}{3}$ 3) $\tan\frac{\pi}{6}$ 4) $\tan^2\frac{\pi}{6}$

16. If y = $\sec^2\theta+\cos^2\theta,\theta\neq 0,$ then

1)y =0 2) $y\leq 2$ 3)$y\geq$ -2 4)y>2

17. $\cos 2x+a\sin x=2a-7$ has a solution if

1) $a=0$ 2) $1\leq a\leq 2$ 3) $2\leq a\leq 6$ 4) $6\leq a\leq 8$

18. If a,b,c are +ve then $\tan^{-1}\sqrt{\frac{a(a+b+c)}{bc}}+\tan^{-1}\sqrt{\frac{b(a+b+c)}{ca}}+\tan^{-1}\sqrt{\frac{c(a+b+c)}{ab}}$ is

1)0 2) π 3) $\pi/2$ 4) $\pi/4$

19. If in a $\Delta ABC, r_3=r_1+r_2+r, then\ \angle A+\angle B$ is

1) 120^0 2) 100^0 3) 90^0 4) 80^0

20. The angles of a triangle are in the ratio $3:5:10$. Then the ratio of the smallest side to the greatest side is

1) $1:\sin 10^0$ 2) $1:2\sin 10^0$ 3) $1:\cos 10^0$ 4) $1:2\cos 10^0$

21. $0(0,0), A(4,0), B(0,6)$ are three points. If P is a point such that area of ΔPOB is twice the area of ΔPOA, then the locus is

1) $4x^2-6y^2=0$ 2) $3x^2-4y^2=0$ 3) $9x^2-16y^2=0$ 4) $4x^2-9y^2=0$

22 A line L has intercepts a and b on the coordinates axes. Keeping the origin fixed, the axes are rotated through a fixed angle. Then the same line has intercepts p and q on the new axes, then

1) $a^2+p^2=b^2+q^2$ 2) $a^2+b^2=p^2+q^2$ 3) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}+\frac{1}{q^2}$ 4) $\frac{1}{a^2}+\frac{1}{p^2}=\frac{1}{b^2}+\frac{1}{q^2}$

23. If a line l passes through $(k,2k),(3k,3k)\ and\ (3,1), k\neq 0$, then the distance from the origin to the line l is

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

24. If p and q are the perpendicular distances from the origin to the straight lines

$x\sec\theta - y\cos ec\theta = a$ *and* $x\cos\theta + y\sin\theta = a\cos 2\theta$ then

1) $4p^2+q^2=a^2$ 2) $p^2+q^2=a^2$ 3) $p^2+2q^2=a^2$ 4) $4p^2+q^2=2a^2$

25. The number of lines that are parallel to $2x+6y-7=0$ and have an intercept 10 between the coordinate axes is

1) 1 2) 2 3) 4 4) infinitely many

26. If two lines represented by the equation $ax^3+bx^2y+cxy^2+dy^3=0$ are at right angles then $a^2+d^2+ac+bd$ is

1)-1 2) 0 3) 1 4) $ab+cd$

27. The circumcentre of the triangle formed by the points $(1,2,3),(2,3,1),(3,1,2)$ is

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

28. If the direction cosines of two lines are such that $l+m+n=0,\ l^2+m^2-n^2=0$ then angle between them is

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

29. The projection of the join of the two points $(1,4,5)(6,7,2)$ on the line whose d.r's are $(4,5,6)$

1) $\frac{13}{\sqrt{77}}$ 2) 7/6 3)21 4) 7/9

30. $\underset{x\to 0}{Lt}\ \frac{\tan\left[e^2\right]x^2-\tan\left[-e^2\right]x^2}{\sin^2 x}$ is

1) 0 2) 8 3) 15 4) 20

31. If $f(x)=\frac{(a^x-1)^3}{\sin(x\log a)\log(1+x^2\log a^2)}$ is continuous at x=0 then f(0) is

1)log a 2) 2 log a 3) $\log a^{-1}$ 4) $\log\sqrt{a}$

32. If $f(x)=\frac{1}{x^2-17x+66}$ *then* $f\left(\frac{2}{x-2}\right)$ is discontinuous at x=

1) $2,\frac{7}{3},\frac{25}{11}$ 2) $2,\frac{8}{3},\frac{24}{11}$ 3) $2,\frac{7}{3},\frac{24}{11}$ 4) None

33. If g is inverse of a function f and $f^1(x)=\frac{1}{1+x^5}$, then $g^1(x)$ is equal to

1) $\frac{1}{1+(g(x))^5}$ 2) $1+(g(x))^5$ 3) $1+x^5$ 4) $5x^4$

34. If $\sqrt{1-x^6}+\sqrt{1-y^6}=a^3(x^3-y^3)$ *then* $\frac{dy}{dx}$ is

1) $\frac{x^2}{y^2}\sqrt{\frac{1-x^6}{1-y^6}}$ 2) $\frac{y^2}{x^2}\sqrt{\frac{1-y^6}{1-x^6}}$ 3) $\frac{x^2}{y^2}\sqrt{\frac{1-y^2}{1-x^2}}$ 4) $\frac{y^2}{x^2}\sqrt{\frac{1-x^6}{1-y^6}}$

35. If $x=\cos\theta+\theta\sin\theta, y=\sin\theta-\theta\cos\theta$ then $\frac{d^2y}{dx^2}$ is

1) $\frac{\cos ec^3\theta}{\theta}$ 2) $\frac{s ce^3\theta}{\theta}$ 3) $\frac{\text{Tan}^3\theta}{\theta}$ 4) $\frac{\cot^3\theta}{\theta}$

36. The area of the triangle formed by the normal to the curve $x = e^{\sin y}$ *at* $(1,0)$ with the coordinate axes is

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

37. Gas is being pumped into a spherical balloon at the rate of $30\,ft^3/\min$ .Then the rate at which the radius increases when it reaches the value of 15ft is

1) $\frac{1}{30\pi}\,ft/\min$ 2) $\frac{1}{15\pi}\,ft/\min$ 3) $\frac{1}{20}\,ft/\min$ 4) $\frac{1}{25}\,ft/\min$

38. The condition that $f(x) = ax^3 + bx^2 + cx + d$ has no extreme value is

1) $b^2 = 4ac$ 2) $b^2 = 3ac$ 3) $b^2 < 3ac$ 4) $b^2 > 3ac$

39. The constant c of Lagrange's theorem for $f(x) = \frac{x}{x-1}\,in[2,4]$ is

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

40. The maximum area of the rectangle that can be inscribed in a circle of radius r is

1) πr^2 2) r^2 3) $\frac{\pi r^2}{4}$ 4) $2r^2$

41. $\text{Tan}(i\log\left(\frac{a-ib}{a+ib}\right)$ is

1)ab 2) $\frac{2ab}{a^2-b^2}$ 3) $\frac{a^2-b^2}{2ab}$ 4) $\frac{2ab}{a^2+b^2}$

42. The maximum value of $|z|$ when z satisfies the condition $\left|z+\frac{2}{z}\right| = 2$ is

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

43. The value of $amp(i\omega) + amp(i\omega^2)$ is

1)0 2) $\frac{\pi}{2}$ 3) π 4) $-\pi$

44. If $x_n = \cos\left(\frac{\pi}{2^n}\right) + i\sin\left(\frac{\pi}{2^n}\right), then \prod_{n=1}^{\infty} x_n$ is

1) -1 2) 1 3) $\frac{1}{\sqrt{2}}$ 4) $\frac{i}{\sqrt{2}}$

45. If $x^2 + bx + a = 0, ax^2 + x + b = 0$ have a common root and the first equation has equal roots, then $2a^2 + b$ is

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

46. The range of $\frac{x^2-2x+9}{x^2+2x+9}(x \in R)$ is

1) $(-\infty,0]\cup[1,\infty)$ 2) $\left[\frac{1}{2},2\right]$ 3) $(-\infty,-2/9)\cup(1,\infty)$ 4) $(-\infty,-6]\cup[-2,\infty)$

47. If α, β, γ are the roots of the equation $2x^3 - 3x^2 + 5x - 7 = 0$ *then* $\sum \alpha^2\beta^2$ is

1) $-\frac{17}{4}$ 2) $\frac{17}{4}$ 3) $\frac{-13}{4}$ 4) $\frac{13}{4}$

48. The sum of two roots of the equation $x^4 - x^3 - 16x^2 + 4x + 48 = 0$ is zero. If $\alpha, \beta, \gamma, \delta$ are the roots of this equation, then $\alpha^4 + \beta^4 + \gamma^4 + \delta^4$ is

1) 123 2) 369 3) 132 4) 396

49. All the numbers that can be formed, using the digits 1,2,3,4,5 are arranged in the increasing order of magnitude, then the rank of 35241 is

1)70 2) 135 3) 275 4) 584

50. The number of positive integral solutions of abc = 30 is

1) 30 2) 27 3) 8 4) 10

51. The greatest number of points of intersection of 8 lines and 4 circles is

1) 64 2) 92 3)104 4) 128

52. The term independent of x in $\left(\frac{x+1}{x^{2/3} - x^{1/3} + 1} - \frac{x-1}{x - x^{1/2}}\right)^{10}$ is

1) 210 2) 310 3) 4 4) 120

53. If $\alpha = \frac{5}{2!3} + \frac{5.7}{3!3^2} + \frac{5.7.9}{4!3^3} + ... + \infty$, *then* $\alpha^2 + 4\alpha$ *is*

1) 21 2) 23 3) 25 4) 27

54. If $\frac{x^4}{(x^2+1)(x-2)} = f(x) + \frac{Ax+B}{x^2+1} + \frac{C}{x-2}$, then $f(14) + 2A - B =$

1) 5C 2) 4C 3) 6C 4) 7C

55. Mean of 100 items is 49. It was discovered that three items which should have been 60,70,80, were wrongly read as 40,20,50 respectively, then the correct mean is

1) 48 2) 82.5 3) 50 4) 80

56. AM= 44, Median = 42 then mode is

1) 39 2) 36 3) 38 4) 40

57. There are 20 cards.10 of these cards have the letter 'I' printed on them and the other 10 cards have the letter 'T' printed on them. If three cards are picked up at random and kept in the same order, the probability of making ward IIT is

1)4/27 2) 5/38 3) 1/8 4) 9/80

58. Mr. A is called for 3 interviews, there are 5 candidates at the first interview,4 at the second and 6 at the third. If the selection of each candidate is equally likely, then the probability that A will be selected for atleast one post is

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

59. A box contains 24 identical balls of which 12 are white and 12 black. The balls are drawn at random from the box one at a time with replacement. Then the probability that a white ball is drawn for the 4^{th} time on 7^{th} draw is

1) 5/64 2) 27/32 3) 5/32 4) 1/2

60. At a telephone enquiry system the number of phone calls regarding relevant enquiry follow Poission

distribution with an average of 5 phone calls during 10minute time intervals the probability that there is at most one phone call during a 10-minute time period is

1)6/55 2) $6/e^5$ 3) $6/e^{-5}$ 4) 5/6

61. The length of the diameter of the circle which touches the X-axis at the point (1,0) and passes through the point (2,3) is

1) 6/5 2) 5/3 3) 10/3 4) 3/5

62. Two tangents are drawn from the origin to a circle with centre at (2,-1). If the equation of one of the tangents is 3x+y=0, then the equation of the other tangent is

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

63. A circle passes through the point (3,4) and cuts the circle $x^2+y^2=a^2$ orthogonally, the locus of its centre is a straight line. If the distance of this straight line from the origin is 25, then a^2 is

1) 250 2) 225 3) 100 4) 25

64. The number of common tangents to the circles $x^2+y^2-8x+2y=0$ *and* $x^2+y^2-2x-16y+25=0$ is

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

65. If the circle $x^2+y^2+4x-6y+c=0$ bisects the circumference of the circle $x^2+y^2-6x+4y-12=0$ then c is

1) 16 2) 24 3) -42 4) -62

66. A circle of radius 4, drawn on a chord of the parabola $y^2=8x$ as diameter, touches the axis of the parabola. Then, the slope of the chord is

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

67. If the lines $2x+3y+12=0$ *and* $x-y+4k=0$ are conjugate with respect to the parabola $y^2=8x$, then the value of K is

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

68. If the line $2x+5y=12$ intersects the elipse $4x^2+5y^2=20$ in two distinct points A and B, then the midpoint of AB is

1) (0,1) 2) (1,2) 3) (1,0) 4) (2,1)

69. In an ellipse the distance between the foci is 6 and its minor axis is 8. Then its eccentricity is

1)4/5 2) $1/\sqrt{52}$ 3) 3/5 4) 1/2

70. The equation of the chord joining two points (x_1,y_1) and (x_1,y_2) on the rectangular hyperbola $xy=c^2$ is

1) $\frac{x}{x_1+x_2}+\frac{y}{y_1+y_2}=1$ 2) $\frac{x}{x_1-x_2}+\frac{y}{y_1-y_2}=1$ 3) $\frac{x}{y_1+y_2}+\frac{y}{x_1+x_2}=1$ 4) $\frac{x}{y_1-y_2}+\frac{y}{x_1-x_2}=1$

71. The integral $\int\left(1+x-\frac{1}{x}\right)e^{x+\frac{1}{x}}dx$ is

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

72. If the integral $\int\frac{5\tan x}{\tan x-2}dx=x+a\log\left|\sin x-2\cos x\right|+k$ then a is

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

73. $\int\frac{\sin^8 x-\cos^8 x}{1-2\sin^2 x\cos^2 x}dx=$

1) $\frac{1}{2}\sin 2x$ 2) $\frac{-1}{2}\sin 2x$ 3) $\frac{1}{2}\sin^2 2x$ 4) $-\sin^2 x$

74. If $\int f(x)dx = \psi(x)$ then $\int x^5 f\left(x^3\right)dx =$

1) $\frac{1}{3}x^3\psi(x^3) - \int x^2\psi(x^3)dx + c$ 2) $\frac{1}{3}\left[x^3\psi(x^3) - \int x^3\psi(x^3)dx\right] + c$

3) $\frac{1}{3}\left[x^3\psi(x^3) - \int x^2\psi(x^3)dx\right] + c$ 4) $\frac{1}{3}x^3\psi(x^3) - 3\int x^3\psi(x^3)dx + c$

75. If $I_1 = \int_0^1 2x^2dx, I_2 = \int_0^1 2^{x^3}dx, I_3 = \int_1^2 2^{x^2}dx$ and $I_4 = \int_1^2 2^{x^3}dx$ then

1) $I_1 > I_2$ 2) $I_2 > I_1$ 3) $I_3 > I_4$ 4)None

76. $\int_0^2 x^2\left[x\right]dx =$

1) 5/3 2) 7/3 3) 8/3 4) 4/3

77. The area bounded by the curves $y = |x| - 1$ *and* $y = -|x| + 1$ is

1) 1 2) 2 33) $2\sqrt{2}$ 4) 4

78. The differential equation of the family of parabolas with vertex at $(0,-1)$ and having axis along the y-axis is

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

79. The solution of $\tan y\frac{dy}{dx} = \sin(x+y) + \sin(x-y)$ is

1) $\sec y = 2\cos x + c$ 2) $\sec y = -2\cos x + c$ 3) $\tan y = -2\cos x + c$ 4) $\sec^2 y = -2\cos x + c$

80. $x^2y - x^3\frac{dy}{dx} = y^4\cos x$ *then* $x^3y^{-3} =$

1) $\sin x$ 2) $2\sin x + c$ 3) $3\sin x + c$ 4) $3\cos x + c$

PHYSICS

81. $\mu = A + \frac{B}{\lambda_1} + \frac{C}{\lambda_2}$ is dimensionally correct. The dimensions of A, B and C respectively. Where μ ,A,B,C are constant, λ is wave length of wave

1) no dimensions l, l^2 2) l^2 ,no dimensions, l 3) l, l^2 ,no dimensions 4) l ,no dimensions, l^2

82. If $\vec{P} = \hat{i} + 2\hat{j} + 6\hat{k}$ its direction cosines are

1) $\frac{1}{41}, \frac{2}{41}$ *and* $\frac{6}{41}$ 2) $\frac{1}{\sqrt{41}}$ *and* $\frac{6}{\sqrt{41}}$ 3) $\frac{3}{\sqrt{41}}, \frac{8}{\sqrt{41}}$ *and* $\frac{7}{\sqrt{41}}$ 4) 1, 2 *and* 6

83. If $S_n = 2 + 0.4n$ find initial velocity and acceleration

1) 2.2 units 2) 0.4 units 3) 2.1 units 4) 0.3 units

84. A missile is fired for maximum range with an initial velocity of $20ms^{-1}$,the range of the missile is $(g = 10m/s^2)$

1) 50 m 2) 60 Cm 3) 20 m 4) 40 m

85. A 60kg man is inside a lift which is moving up with an acceleration of $2.45ms^{-2}$. The apparent percentage change in weight is
1) 20% 2) 25% 3) 50% 4) 75%

86. A force of 150N produces an acceleration of $2ms^{-2}$ in a body and a force of 200N produces an acceleration of $3ms^{-2}$. The mass of the body and the coefficient of kinetic friction are
1) $50kg:0.1$ 2) $25kg:0.1$ 3) $50kg:0.5$ 4) $50kg:0.2$

87. A body starts from rest and moves with uniform acceleration. The ratios of kinetic energies at the end of $1^{st}, 2^{nd}, 3^{rd}$ seconds of its journey is
1) 1:8:27 2) 1:2:3 3) 1:4:9 4) 3:2:1

88. A plastic ball falling from a height 4.9m rebounds number of times. If total time for second collision is 2.4S,then e=
1) 0.3 2) 0.4 3) 0.7 4) 0.6

89. A stationary wheel starts rotating about is own axis at uniform angular, acceleration $8rad/s^2$. The time taken by it to complete 77 rotations is
1) 5.5sec 2) 7sec 3) 11sec 4) 14 sec

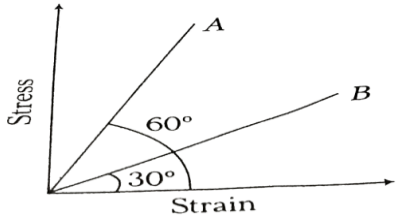
90. An electric motor exerts a constant torque 5Nm on a fly wheel, it is rotated at the rate of 4701 pm . The power of motor is
1) 110 watt 2) 150 watt 3) 220 watt 4) 300 watt

91. Intensity of gravitational field inside the hollow spherical shell is
1) Variable 2) minimum 3) maximum 4) zero

92. The displacement of a particle is SHM is $x = 3\sin(20\pi t) + 4\cos(20\pi t)cm$. Its amplitude of oscillation is
1) 3 cm 2) 4 cm 3) 5 cm 4) 25 cm

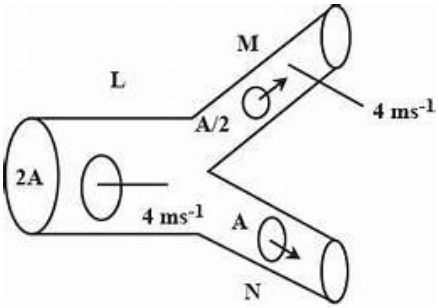
93. For a body is SHM the velocity is given by the relation $v = \sqrt{144 - 16x^2}ms^{-1}$.The maximum acceleration is
1) $12m/s^2$ 2) $16m/s^2$ 3) $36m/s^2$ 4) $48m/s^2$

94. The stress versus strain graphs for wires of two materials 'A' and B are as shown in the figure. If Y_A *and* Y_B are the young's moduli of the materials, then



1) $Y_8 = 2Y_A$ 2) $Y_A = Y_B$ 3) $Y_8 = 3Y_A$ 4) $Y_A = 3Y_B$

95. An incompressible liquid flows through a horizontal tube L,M,N as shown in the figure. Then the velocity 'V' of the liquid through the tube N is



1) $1ms^{-1}$ 2) $2ms^{-1}$ 3) $4.5ms^{-1}$ 4) $6ms^{-1}$

96. The viscos resistance of a tube to liquid flow is RR. Its resistance for a narrow tube of same length and 1/3 times radius is
1)R/3 2) 3R 3)27 R 4) 81 R

97. If two temperatures differ by 25 degree on Celsius scale, the difference of temperature on fahren heat scale is
1) 65^0 2) 45^0 3) 38^0 4) 25^0

98. Heat given to a system is 35 joules and work done by the system is 15 joules. The change in the internal energy of the system will be
1) $-50J$ 2) $20J$ 3) $30J$ 4) $50J$

99. The efficiency of a heat engine if the temperature of source 227^0c and that of sink is 27^0c nearly
1) 0.4 2) 0.5 3) 0.6 4) 0.7

100. The temperature at which the r.m.s speed of oxygen molecules equal to the r.m.s speed of carbon dioxide molecules at 23^0c
1) $+91.2^0c$ 2) -91.2^0c 3) 112.2^0c 4) -112.2^0c

101. When a string fixed at its two ends vibrates in 1 loop , 2 loops,3 loops and u loops, the frequencies are in the ratio
1) 1:3:5:7 2) 1:2:3:4 3) 1:5:9:13 4) 3:7:11:15

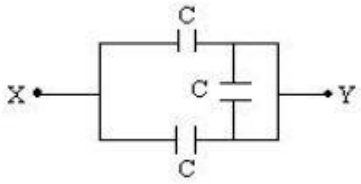
102. For a glass prision the angle of minimum deviation is equal to the angle of the prision. Then the angle of the prism is
1) 45^0 2) 30^0 3) 60^0 4) 90^0

103. The limit of resolution of micro scope, if the numerical aperture of microscope is 0.12 *and* the wavelength of light used is 600Nm is
1) $0.3\mu m$ 2) $1.2\mu m$ 3) $2.5\mu m$ 4) $3\mu m$

104. A proton of mass 'm' charge 'e' is released from rest in a uniform electric field of strength 'E'. The time taken by it to travel a distance 'd' in the field is
1) $\frac{\sqrt{2de}}{mE}$ 2) $\sqrt{\frac{2dm}{Ee}}$ 3) $\sqrt{\frac{2dE}{me}}$ 4) $\sqrt{\frac{2Ee}{dm}}$

105. A charge of 5 C is placed at the center of a spherical gaussian surface of radius 5 cm. The electric fill through the surface is $\frac{1}{E_0}$ times of
1) $0.1Nm^2/C^2$ 2) $0.5Nm^2/C^2$ 3) $1Nm^2/C^2$ 4) $5Nm^2/C^2$

106. The equivalent capacity between the points X and Y in the circuit with $C=1\mu F$

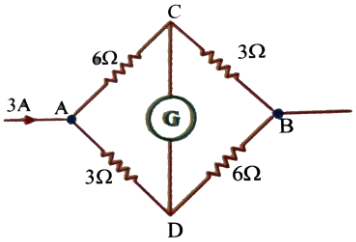


1) $2\mu F$ 2) $3\mu F$ 3) $1\mu F$ 4) $05\mu F$

107. The resistance of a wire is 2 Ω . If it is drawn in such a way that it experiences a longitudinal strain 200% Its new resistance is .

1) 4Ω 2) 8Ω 3) 16Ω 4) 18Ω

108. In the given circuit current through the galvanometer is



1)zero 2) flows from C to D 3) flow from D to C 4) in sufficient information

109. Two equal resistance are connected in the gaps of a meter bridge. If the resistance in the left gap is increased by 10%, the balancing point shift

1) 10% to right 2) 10% to left 3) 9.6% to right 4) 4.8% to right

110. The magnetic induction at distance of 0.1 m from a strong magnetic pole of strength 1200 Am is

1) $12\times10^{-3}T$ 2) $12\times10^{-4}T$ 3) $1.2\times10^{-3}T$ 4) $24\times10^{-3}T$

111. Two parallel conductors A and B separated by 5 cm any electric current of 6A and 2A in the same direction. The point between A and B where the field is zero at

1)0.25 cm from B 2) 1cm from B 3) 1.25cm from B 4) 3.75 cm from B

112. A cyclotron in which protons are accelerated has a flux density of 1.57T. The variation of frequency of electric field is (in Hz)

1) 4.8×10^{8} 2) 8.4×10^{8} 3) 2.5×10^{7} 4) 4.8×10^{6}

113. The peak voltage of 220volt AC mains(in volt) is

1) 155.6 2) 220.0 3) 311 4) 440.0

114. The de-Broglie wavelength of an electron and the wavelength of a photon are same. The ratio between the energy of the photon and the momentum of the electron is

1) h 2) C 3) $1/h$ 4) $1/C$

115. Find the frequency of revolution of the electron in the first stationary orbit of H- atom

1) $6\times10^{14}\,Hz$ 2) $6.6\times10^{10}\,Hz$ 3) $6.6\times10^{-10}\,Hz$ 4) $6.6\times10^{15}\,Hz$

116. If a source of power 14KW produces 10^{20} photons 1 second, the radiation belong to a part of the Spectrum called

1) X-rays 2) ultraviolet rays 3) Microwaves 4) r-rays

117. Energy released as mass of 2amu is converted into energy is

1) $1.5\times10^{-10}\,J$ 2) $3\times10^{-10}\,J$ 3) $1863J$ 4) $931.5MeV$

118. The current gain of a common emitter amplifier is 69. If the emitter current is 7.0 mA, collector current Is

1) 0.69mA 2) 6.9mA 3) 69mA 4) 9.6mA

119. In the boolean algebra, the following one which is not equal to A is

1) A.A 2) $A+A$ 3) $\overline{A}.A$ 4) $\overline{A}+\overline{A}$

120. In an amplitude modulated wave for audio frequency of 500 cycle /second, the appropriate carrier frequency will be

1) 50cycles/second 2) 100cycles/second 3) 500cycles/second 4) 50000cycles/second

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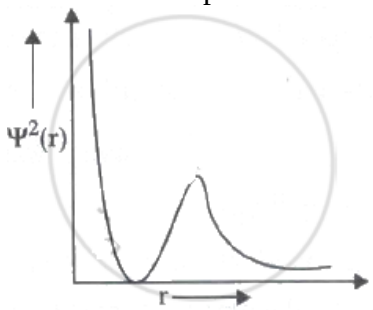
121. The graph between variation of probability density $\psi^2(r)$ and distance of the electron from the nucleus, r is shown below. This represents



1)1s-orbital 2)2s-orbital 3)3s-orbital 4)4s-orbital

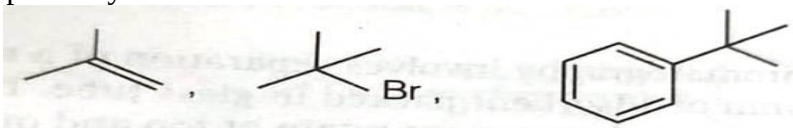
122. For the redox reaction $MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$, the correct coefficient of the reactants for the balanced reaction are respectively

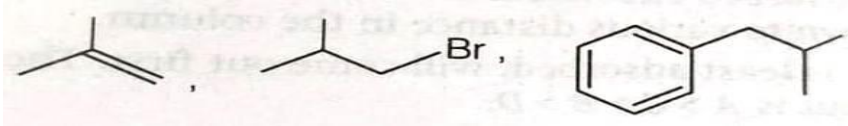
1) 2 , 5 ,16 2) 16, 3 ,12 3) 15,16,12 4) 2,16,5

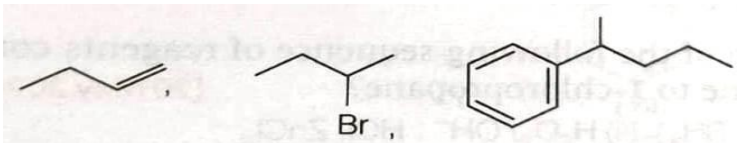
123. If the bond order in c_2 is 'x' then bond order in B_2 and O_2,respectively are

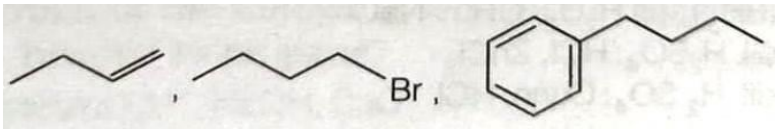
1) $\frac{1}{2}x, 2x$ 2) x, x 3) $\frac{1}{2}x, x$ 4) $x, 2x$

124. An alkene $X(C_4H_6)$ on reaction with HBr gave $Y(C_4H_9Br)$. Reaction of Y with benzene in the presence of anhydrous gave Z which is resistant to oxidation with $KMnO_4KOH$ .What are X,Y,Z respectively?

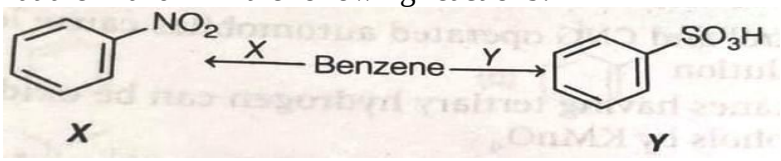
1) 

2) 

3) 

4) 

125. What are X and Y in the following reactions?

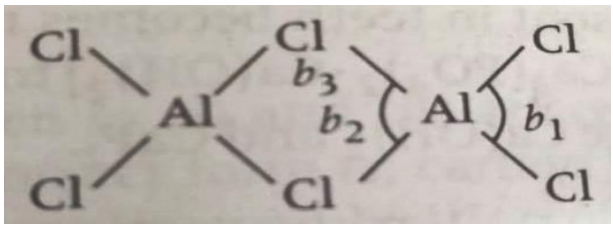


1) $Conc.HNO_3$ $H_2SO_4(SO_3)$

2) $Conc.HNO_3 + Conc.H_2SO_4 / 333\,K$ $H_2SO_4(SO_3)$

3) $NaNO_2 / HCl$ H_2SO_4 4) $Dil.HNO_3$ SO_3

126. The bond angles b_1, b_2 *and* b_3 given structure are respectively(in ^{0})



1) 79,101,118 2) 118,101,79 3)79,118,101 4) 118,79,101

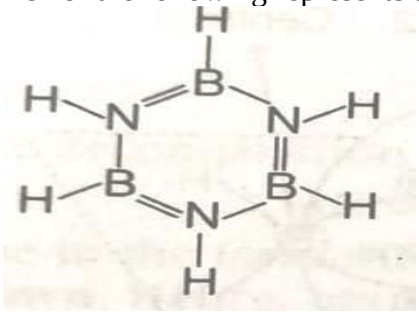
127. Match the following

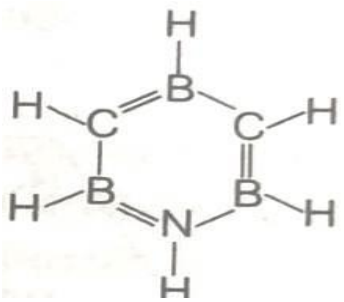
LIST I	LIST II
A Carbon black	I. Electrodes in batteries
B Graphite	II. Extraction of metals
C. Diamond	III. Abrasive
D. Activated charcoal	IV. Filler in automobile tyres
	V. Air conditioning system

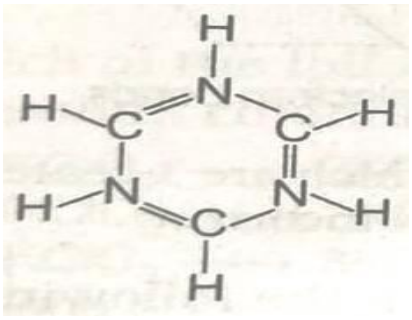
1) $A-IV, B-III, C-II, D-V$ 2) $A-III, B-I, C-II, D-IV$

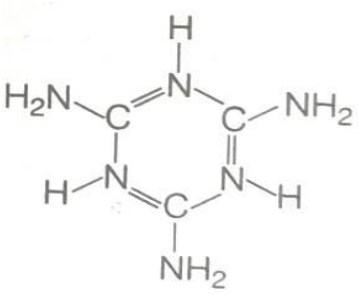
3) $A-V, B-I, C-III, D-II$ 4) $A-IV, B-I, C-III, D-V$

128. Which of the following represents the structure of inorganic benzene?

1) 

2) 

3) 

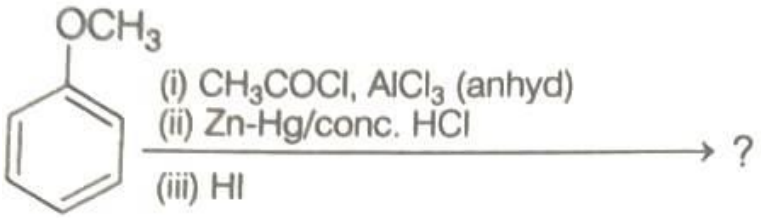
4) 

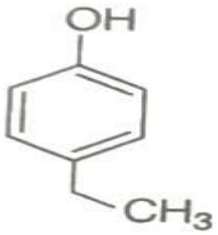
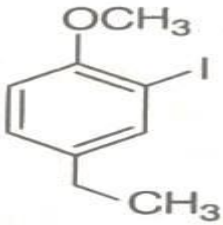
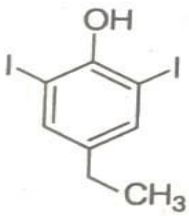
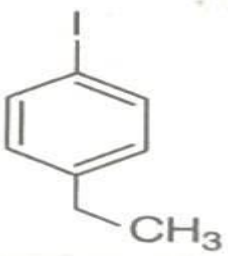
129. $2Cu_2O(s)+Cu_2S(s)\rightarrow 6Cu(s)+SO_2(g)$ the oxidant and reductant respectively in the above reaction are

1)Oxide of Cu_2O and sulphide of Cu_2S 2) Sulphide of Cu_2S and oxide of Cu_2O

3) Cu(l) of Cu_2O, Cu_2S and sulphide of Cu_2S 4)Cu(l) of Cu_2S ,Cu(l) of Cu_2O

130. The Major product of the following reaction sequence is



1)  2)  3)  4) 

131. Which of the following sets of reagents convert toluene to benzaldehyde?

A) $Cl_2\,|\,hv;H_2O,\Delta$ B) $KMnO_4\,|\,OH^-;H^+$ C) $Cl_2\,|\,Fe;H_2O$ D) $CrO_2Cl_2\,|\,CS_2;H_3O^+$

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

132. Under which of the following conditions E value of the cell, for the cell reaction given is maximum ?

$$Zn(s)+Cu^{2+}(aq)\square\quad Cu(s)+Zn^{2+}(aq)\left(\begin{array}{c}\dfrac{2.303rt}{F}\ at\ 298K=0.059V,\\ E^0_{Zn^{2+}/Zn}=-0.76V, E^0_{Cu^{2+}/Cu}=+0.34V\end{array}\right)$$

1) $C_1=0.1M, C_2=0.01M$ 2) $C_1=0.01M, C_2=0.1M$

3) $C_1=0.1M, C_2=0.2M$ 4) $C_1=0.2M, C_2=0.1M$

133. The validity of freundilich isotherm can be verified by plotting

1) $\log\frac{x}{m}$ on y-axis and log p on x-axis 2) $\frac{x}{m}$ on y-axis and log p on x-axis

3) $\log\frac{x}{m}$ on x-axis and log p on y-axis 4) $\frac{x}{m}$ on x-axis and log p on y-axis

134. In f-block elements ------- orbitals are progressively filled by the electrons
1) $3l$ *and* $4l$ 2) $4l$ *and* $5l$ 3) $5l$ *and* $6l$ 4) $6l$ *and* $7l$

135. Match the following based on valence bond theory

	Hybridisation		**Geometry**		**Complex structure**
A	sp^3	**i.**	**Square planar**	**p.**	$[Fe(CN)_6]^{3-}$
B	d^2sp^3	**ii.**	**Tetrahedral**	**q.**	$(ZnCl_4)^{2-}$
C	dsp^2	**iii**	**Octahedral**	**r.**	$[(Ni(NH_3)_4]^{2+}$
				s.	$[Ag(CN)_2]^-$

1) $(A-ii-q),(B-iii-p),(C-i-r)$ 2) $(A-ii-q),(B-iii-r),(C-i-s)$
3) $(A-i-q),(B-iii-p),(C-ii-r)$ 4) $(A-ii-r),(B-iii-s),(C-i-q)$

136. At T(K) the equilibrium constant for the reaction $aA(g) \rightleftharpoons bB(g)$ *is* K_c. If the reaction takes place in the following form $2aA(g) \rightleftharpoons 2bB(g)$, its equilibrium constant is K^1_c. The correct relation ship between K_c *and* K^1_c is
1) $K^1_c = (K_c)^2$ 2) $K^1_c = (K_c)^{1/2}$ 3) $K^1_c = (K_c)^{-1}$ 4) $K^1_c = K_c$

137. The crystal structure of an element has fcc lattice. If the edge length of the crystal is $4\overset{0}{A}$. What is the atomic weight of the element. If the density of the crystal is $11.21 g\,cm^3$ ($N_A = 6.023\times10^{23} mol^{-1}$)
1)63.5 2) 85.5 3)108.0 4)197.0

138. In water, which of the following gases has the highest Henry's law constant at 293K?
1) N_2 2) O_2 3) He 4) H_2

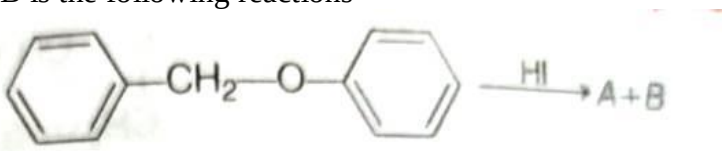
139. For a first order reaction the concentration of reactant was reduced from $0.03 molL^{-1}$ *to* $0.02 molL^{-1}$ in 25min. What is the rate((*in* $molL^{-1}$)?
1) 6.667×10^{-6} 2) 4×10^{-4} 3) 6.667×10^{-4} 4) 4×10^{-6}

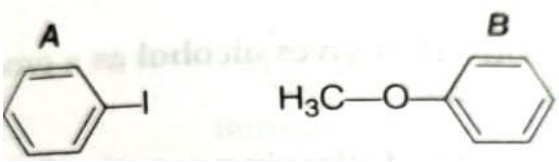
140. Compounds A and B react according to the equation $2A(g)+B(g)\rightarrow 2C(g)+D(g)$. The initial rate of formation was determined at different initial concentrations of A and B. The following results were obtained. The rate law for this reaction may be -------

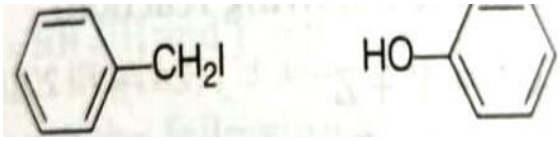
Exp. No	Initial(A)	Initial(B)	Initial rate of formation of C
1	0.1	0.1	6×10^{-3}
2	0.3	0.2	7.2×10^{-2}
3	0.3	0.4	2.88×10^{-1}
4	0.4	0.1	2.4×10^{-2}

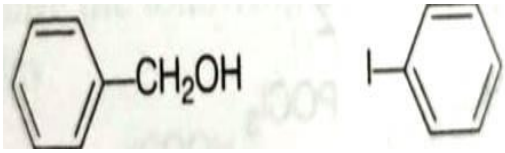
1) $Rate = k[A]^2[B]$ 2) $Rate = k[A][B]^2$ 3) $Rate = k[A][B]$ 4) $Rate = k[A]^2[B]^0$

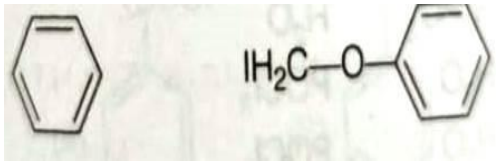
141. Identify A and B is the following reactions



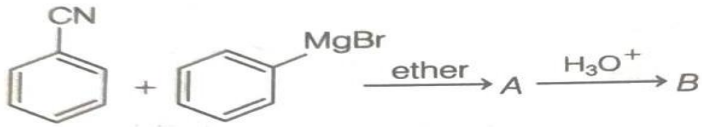
1) 

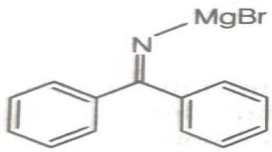
2) 

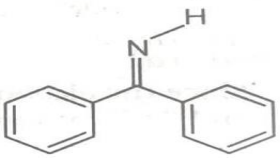
3) 

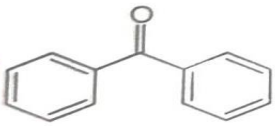
4) 

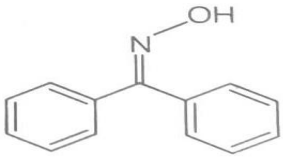
142. Identify B in the given reaction sequence



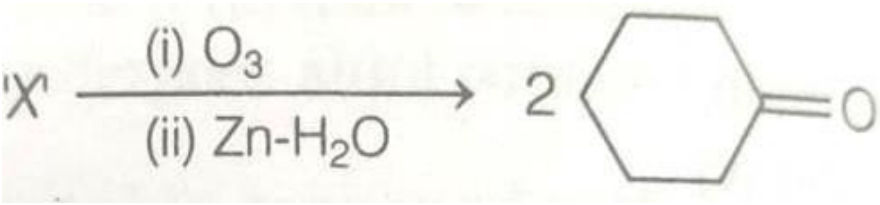
1) 

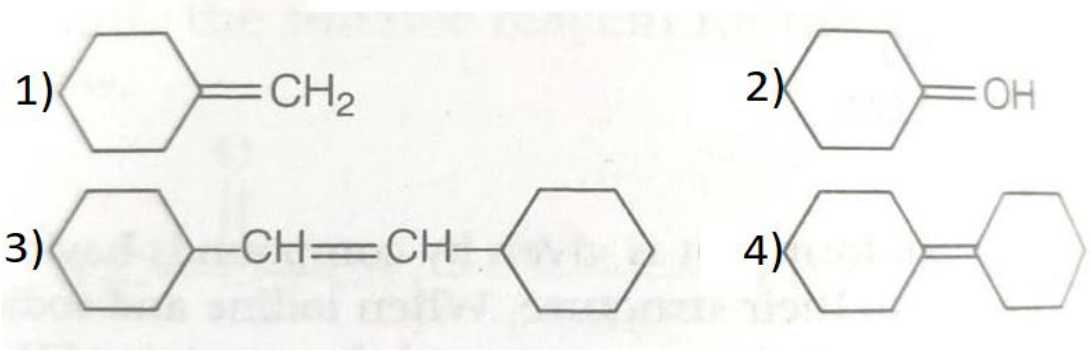
2) 

3) 

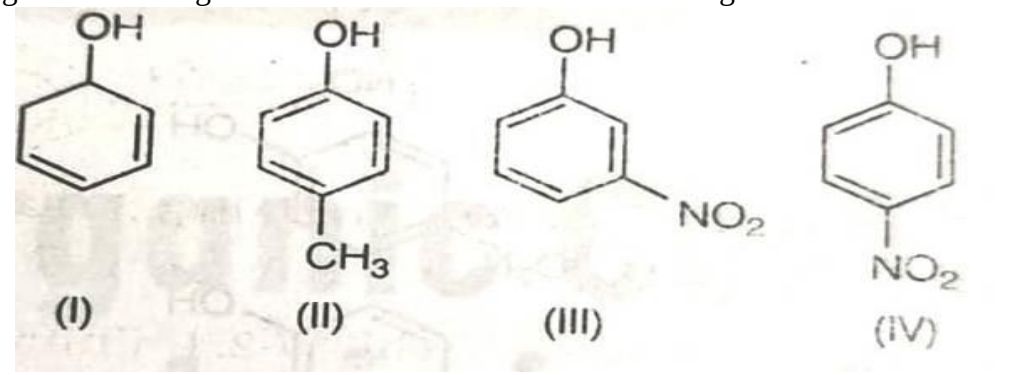
4) 

143. Identify 'X' in the following reaction





144. Arrange the following in the correct order of their acidic strength



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

145. Which of the following polymer is biodegradable?

1)Nylon-6,6 2)Nylon-2-nylon-6 3) Mealamine polymer 4)Nylon-6

146. Which of the following structure of proteins represents its constitution?

1)Secondary structure 2)Quatermary structure 3)Primary structure 4)Tertiary structure

147. Match the following

List-I	List-II
A. Beri-Beri	I. Riboflavin
B. Scurvy	II. Thiamine
C. Cheilosis	III. Pyridoxine
D. Rickets	IV. Ascorbic acid
	V. Vitamin D

The correct answer is

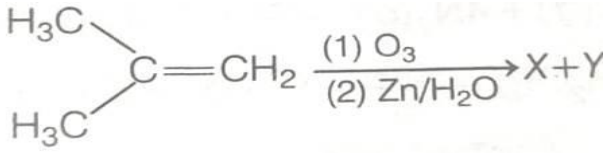
1) $A-III, B-IV, C-III, D-V$ 2) $A-II, B-IV, C-I, D-V$

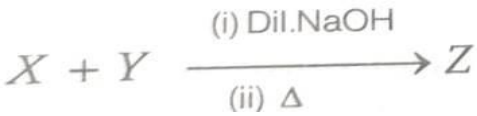
3) $A-III, B-V, C-I, D-II$ 4) $A-III, B-V, C-IV, D-II$

148. The mass % of carbon in $C_{57}H_{110}O_6$ is

1)57.96 2) 62.35 3) 73.45 4) 76.85

149. Consider the reactions





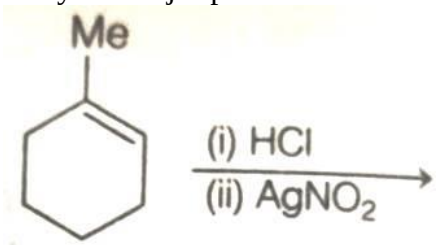
The IUPAC name of Z is

1)But-1-en-3-one 2)4-hydroxybutan-2-one 3)But-3-en-2-one 4)1-hydroxybutan-3-one

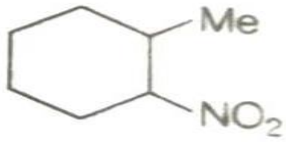
150. In Kolbe's electrolysis of sodium propanoate, products formed at anode and cathode are respectively

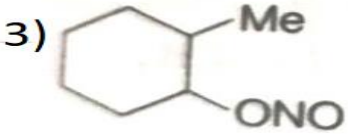
1) C_2H_6, H_2 2) C_3H_8, H_2 3) C_4H_{10}, H_2 4) H_2, C_4H_{10}

151. Identify the major product formed from the following reaction



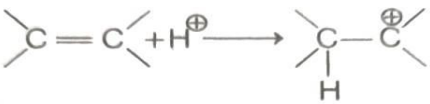
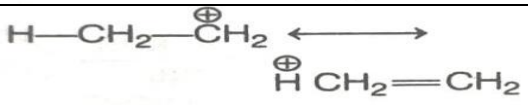
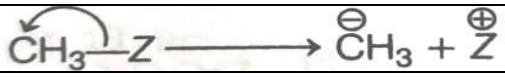
1) 

2) 

3) 

4) 

152. Match the following

	List I		List II
A	Resonance	i.	
B	Inductive effect	ii.	
C	Electromeric effect	iii.	C_6H_6
D	Hyperconjugation	iv.	
		v)	$CH_3-CH_2-CH_2Cl$

The correct answer is

	A	B	C	D
1)	II	I	IV	III
2)	III	V	I	II
3)	I	III	II	IV

153. The spin only magnetic moments of the complexes $[Mn(CN)_6]^{3-}$ and $[Co(C_2O_4)_3]^{3-}$ are respectively
1)2.84 ,0 BM 2) 0,0 BM 3) 0 , 1.2 BM 4) 1, 2 BM

154. The products formed when borax dissolves in water is/are
1) $NaOH, H_3BO_3$ 2) $Na_2[B_4O_5(OH)_4]$ 3) NaH, B_2O_3 4) $B_2H_6, NaOH$

155. Which statement about noble gases is not correct?
1) 'Xe' forms XeF_6 under suitable conditions 2)'Ar' is used in electric bulbs
3)The number of lone pair of electrons present on Xe in XeF_2 is 3
4) 'He' has the highest boiling point among all the noble gases

156. Which one of the following methods is used to prepare carbon monoxide on commercial scale?
1)Dehydration of formic acid with conc. H_2SO_4
2) Direct oxidation of C in limited supply of oxygen
3) Passing steam over hot cake
4) Heating lime stone

157. Match the following

List-I((process)	List_II(catalyst)
A. Ostwald's process	I. No
B. Lead chamber process	II. Fe
C. Deacon's Process	III. Rh
D.Haber's process	IV. $CuCl_2$

1) $A-IV, B-I, C-II, D-III$ 2) $A-II, B-III, C-IV, D-I$
3) $A-III, B-I, C-IV, D-II$ 4) $A-III, B-IV, C-I, D-II$

158. The O-H bond length in H_2O in gas phase is
1) 95.7 pm 2) 90.2 pm 3) 104.5pm 4) 115.5 pm

159. The set of amphoteric oxides among $ZnO, TIO_3, In_2O_3, B_2O_3, PbO, SnO_2$ is
1) ZnO, TIO_3, PbO 2) ZnO, SnO_2, PbO 3) ZnO, In_2O_3, SnO_2 4) ZnO, In_2O_3, PbO

160. $A \rightarrow$ products, is a first order reaction. The time required to decompose A to half its initial amount is 60 minutes. The rate constant of the reaction is
1) 1.05×10^{-2} 2) 1.15×10^{-2} 3) 1.25×10^{-4} 4) 1.92×10^{-4}

KGCET - 2K25

KSRM COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
KLM COLLEGE OF ENGINEERING FOR WOMEN, KADAPA
FOR ENGINEERING ASPIRANTS

KEY SHEET

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

4	**1**	**1**	**2**	**1**	**1**	**3**	**3**	**1**	**2**
141	**142**	**143**	**144**	**145**	**146**	**147**	**148**	**149**	**150**
2	**3**	**4**	**2**	**2**	**33**	**2**	**4**	**3**	**3**
151	**152**	**153**	**154**	**155**	**156**	**157**	**158**	**159**	**160**
1	**2**	**2**	**1**	**4**	**3**	**3**	**1**	**2**	**4**