SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

SR MPC | **EAMCET MODEL** | **Date: 15-04-2020**

Time: 3 Hours | **Max. Marks: 160**

MATHS-A

SYLLABUS: Properties of triangles, Hyperbolic functions, Mathematical induction, Functions

1. **If the angle of triangle are in the ratio $1:1:4$ then the ratio of the perimeter of the triangle to its largest side is**

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

2. **In ΔABC, if $\cos A+2\cos B+\cos C=2$ then a, b, c are in**

1) A. P 2) H. P 3) G. P 4) None

3. **In ΔABC, $(a+b+c)\left(\tan\frac{A}{2}+\tan\frac{B}{2}\right)=$**

1) $2c\cot\frac{C}{2}$ 2) $2a\cot\frac{A}{2}$ 3) $2b\cot\frac{B}{2}$ 4) $\tan\frac{C}{2}$

4. **In ΔABC if $\frac{1}{b+c}+\frac{1}{c+a}=\frac{3}{a+b+c}$ then $C=?$**

1) 90^0 2) 60^0 3) 45^0 4) 30^0

5. **In ΔABC, $a^2\sin 2C+C^2\sin 2A=?$**

1) Δ 2) 2Δ 3) 3Δ 4) 4Δ

6. **If Δ is the area of the triangle with sides a, b, c then area of the triangle with sides $2a,2b$ and 2c is**

1) 2Δ 2) 4Δ 3) 8Δ 4) 16Δ

7. **In ΔABC, if $a=2\left(\sqrt{3}+1\right), B=45^0$ and $C=60^0$, then the area (in sq. units) of that triangle is**

1) $2\sqrt{3}$ 2) 6 3) $6+2\sqrt{3}$ 4) $6-2\sqrt{3}$

8. **The perimeter of triangle is 16cm, one of the sides is of length 6 cm. If the area of the triangle is 12 sq. cm, then the triangle is**

1) Right angle 2) Isosceles 3) Equilateral 4) Scalene

9. **In ΔABC, $r_1=8, r_2=12$ and $r_3=24$ then the ordesed tripie $(a,b,c)=?$**

1) $(8,12,14)$ 2) $(12,16,20)$ 3) $(16,12,20)$ 4) $(16,20,12)$

10. **In ΔABC, if $r_1=2, r_2=3$ and $r_3=6$ then a = ?**

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

11. **In ΔABC, $\frac{1}{r^2}+\frac{1}{r_1^2}+\frac{1}{r_2^2}+\frac{1}{r_3^2}=$?**

1) $\frac{a+b+c}{\Delta}$ 2) $\frac{a^2+b^2+c^2}{\Delta}$ 3) $\frac{a+b+c}{\Delta^2}$ 4) $\frac{a^2+b^2+c^2}{\Delta^2}$

12. **In ΔABC if $a=2, b=\sqrt{6}$ and $c=\sqrt{3}+1$, then $\sin^2 C-\sin^2 A=$?**

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

13. **Let Δ denotes the area of ΔABC. If α,β,γ are the lengths of the altitudes of ΔABC $\alpha^{-2}+\beta^{-2}+\gamma^{-2}=?$**

1) $\frac{4}{\Delta}(\tan A+\tan B+\tan C)$ 2) $\frac{1}{\Delta}(\cot A+\cot B+\cot C)$

3) $\frac{\Delta^2}{2}(\tan A+\tan B+\tan C)$ 4) $\frac{\Delta^2}{4}(\cot A+\cot B+\cot C)$

14. **If P_1, P_2, P_3 are the lengths of the altitudes of ΔABC then $\frac{1}{P_1}+\frac{1}{P_2}+\frac{1}{P_3}=?$**

1) $\frac{2ab\sin^2\left(\frac{c}{2}\right)}{\Delta(a+b+c)}$ 2) $\frac{ab\sin^2\left(\frac{c}{2}\right)}{\Delta(a+b+c)}$

3) $\frac{2ab\cos^2\left(\frac{c}{2}\right)}{(a+b+c)\Delta}$ 4) $\frac{ab\cos^2\left(\frac{c}{2}\right)}{\Delta(a+b+c)}$

15. **In ΔABC, if $a\sin A=n\sin B$ then the triangle is**

1) Equilateral 2) Right angled 3) Right angled isosceles 4) Isosceles

16. **In any triangle ABC, if $a:b:c=2:3:4$, then $R:r=?$**

1) $8:3$ 2) $16:9$ 3) $5:16$ 4) $16:5$

17. **In ΔABC, if $\frac{\sin 3B}{\sin B}=\left(\frac{a^2-c^2}{4a^2c^2}\right)$ then $a^2+c^2=?$**

1) b^2 2) $2b^2$ 3) $3b^2$ 4) $4b^2$

18. **In ΔABC, if the median AD drawn through A is perpendicular to the side AC, then $3ca\cos A\cos C+2a^2=?$**

1) c^2 2) $2c^2$ 3) $3c^2$ 4) $4c^2$

19. **In ΔABC, if median AD is perpendicular to 'AB' then $a^2-b^2=?$**

1) $2c^2$ 2) c^2 3) $3c^2$ 4) $4c^2$

20. **In ΔABC, if $b\cos\theta=c-a$ (where θ is an acute angle), then $(c-a)\tan\theta=?$**

1) $2\sqrt{ca}\cos\frac{B}{2}$ 2) $2\sqrt{ca}\sin\frac{B}{2}$ 3) $2ca\sin\frac{B}{2}$ 4) $2ca\cos\frac{B}{2}$

21. **If $\sinh(x)=\frac{3}{2}$ then $\sinh(2x)=?$**

1) $\frac{5}{8}$ 2) $\frac{15}{8}$ 3) $\frac{7}{8}$ 4) $\frac{17}{8}$

22. **If $f(x)=\cosh x+\sinh x$ and $f(x)f(y)=f(k)$ then k = ?**

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

23. **If $\cosh(x)=\sec\theta$ then $\tanh^2\left(\frac{x}{2}\right)=?$**

1) $\tan^2\left(\frac{\theta}{2}\right)$ 2) $cot^2\left(\frac{\theta}{2}\right)$ 3) $-\tan^2\left(\frac{\theta}{2}\right)$ 4) $-\cot^2\left(\frac{\theta}{2}\right)$

24. **If $x=\tanh^{-1}(y)$ then $\log_e\left(\frac{1+y}{1-y}\right)=?$**

1) x 2) $4x$ 3) $2x$ 4) $3x$

25. $\coth^{-1}(3)=?$

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

26. $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)....\left(1-\frac{1}{n+1}\right)=$

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

27. $1.2+2.3+3.4+....n$ **terms =**

1) $\frac{n(n+1)(n+5)}{3}$ 2) $\frac{n(n+1)(n+2)}{3}$

3) $\frac{n\left(4n^2+6n-1\right)}{3}$ 4) $n(n+1)(n+2)$

28. **Sum of** n **terms of the series** $1^3+3^3+5^3+....$ **is**

1) $n^2\left(n^2-1\right)$ 2) $n^2\left(2n^2-1\right)$ 3) $n^2\left(2n^2+1\right)$ 4) $n^2\left(2n^2\right)$

29. $2^{3n}-7n-1$ **is divisible by**

1) 64 2) 36 3) 49 4) 25

30. $3^{2n+2}-2^3.n-9$ **is divisible by**

1) 3 2) 9 3) 64 4) 81

31. **If** $A=\{a,b,c,d,e\}$ **and** $B=\{1,2,3,4\}$ **then which of the following is a function from A to B?**

1) $\{(a,1),(b,2),(c,4),(d,4),(d,3)\}$ 2) $\{(a,1),(b,2),(c,3),(d,4),(e,4)\}$

3) $\{(a,1),(b,2),(c,3),(d,4),(c,4)\}$ 4) $\{(a,1),(b,2),(c,3)\}$

32. **The number of many one functions from** $A=\{1,2,3\}$ **to** $B=\{a,b,c,d\}$ **is**

1) 64 2) 0 3) 40 4) 60

33. **If the number of elements in A is 106 then the number of bujective functions we can define from A to A is**

1) 106 2) $(106)^2$ 3) 106! 4) 2^{106}

34. **The function** $f(x)$ **satisfying the condition** $f\left(x+\frac{1}{x}\right)=x^2+\frac{1}{x^2}$ **is** $f(x)=?$

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

35. **If** $f:R\to R$ **is defined by** $f(x)=x^2-10x+21$ **then** $f^{-1}(-3)$ **is**

1) $\{-4,6\}$ 2) $\{2,4\}$ 3) $\{4,-6\}$ 4) $\{4,6\}$

36. **If** $f(x)=\frac{ax+2}{x-b}$, $f^{-1}(1)=0$ **and** f^{-1} **is not defined at 3 then** $(a,b)=$

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

37. **If** $f(x)=\frac{1-x}{1+x}$ **then** $f\left[f(\cos x)\right]$ **equals**

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

38. **If** $f:R\to R$ **is defined by** $f(x)=\frac{1-x}{1+x}$ **then** $(fofofof)(x)=$

1) $2x$ 2) $3x$ 3) x 4) $f(x)$

39. **If** $f(x+y)=f(x)f(y)$ **and** $f(5)=32$ **then** $f(7)=$

1) 35 2) 36 3) $\frac{7}{5}$ 4) 128

40. **If** $f:R\to R$ **such that** $f(x)=\frac{4x+3}{5}$ **then** $f^{-1}(x)=?$

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

MATHS-B

SYLLABUS: Pair of straight line, 3D- coordinate system, Dc's and Dr's and Planes

41. **The combined equation to a pair of straight lines passing through the origin and inclined at an angles** 30^0 **and** 60^0 **respectively will** $x-axis$

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

3) $x^2+\sqrt{3}y^2-2xy=0$ 4) $x^2+3y^2-2xy=0$

42. **Area of the triangle formed by the lines** $2x-y=6$ **and** $3x^2-4xy+y^2=0$ **is**

1) 16 2) 25 3) 36 4) 49

43. **If '**θ**' is the a cute angle between the pair of lines** $x^2+3xy-4y^2=0$ **then** $\sin\theta=$

1) $\frac{\pi}{6}$ 2) $\frac{\pi}{3}$ 3) $\frac{5}{\sqrt{34}}$ 4) $\frac{3}{\sqrt{34}}$

44. **If the equation of the pair of bisectors of the angle between the pair of lines** $3x^2+xy+by^2=0$ **is** $x^2-14xy-y^2=0$ **then** $b=$

1) 4 2) -4 3) 8 4) -8

45. **The angle between the pair of lines** $x^2(\sin^2\theta-1)-\cos^2\theta xy+y^2\cos^2\theta=0$

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

46. **If the product of perpendiculars from** (k,k) **to the pair of lines** $x^2+4xy+3y^2=0$ **is** $\frac{4}{\sqrt{5}}$ **then k is**

1) ±4 2) ±3 3) ±2 4) ±1

47. **The value k such that** $3x^2+11xy+10y^2+7x+13y+k=0$ **represents a pair of straight lines is**

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

48. **Angle between the pair of lines** $2x^2+7xy+3y^2+3x+y-2=0$

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

49. **If** $x^2-y^2=0$, $lx+2y=1$ **from an isosceles triangle then** $l=$

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

50. **If the pair of straight lines** $x^2-2pxy-y^2=0$ **and** $x^2-2qxy-y^2=0$ **be such that each pair bisects the angle between the other pair, then**

1) $pq=-1$ 2) $p=q$ 3) $p=-q$ 4) $pq=1$

51. **The point of intersection of the pair of lines** $x^2+xy+2y^2-3x+2y+4=0$ **is**

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

52. **The square of the distance of the point of intersection of the lines** $6x^2-5xy-6y^2+x+5y+1=0$ **from the origin is**

1) $\frac{74}{169}$ 2) $\frac{85}{169}$ 3) $\frac{74}{185}$ 4) $\frac{2}{13}$

53. **The figure formed by the four lines** $3x^2+10xy+3y^2=0$ **and** $3x^2+10xy+3y^2-28x+49=0$

1) Parallelogram 2) Rhombus 3) Rectangle 4) Square

54. **If the distance between the pair of parallel lines $x^2+2xy+y^2-8ax-8ay-9a^2=0$ is $25\sqrt{2}$ then $a=$**

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

55. **The equation $3x^2+10xy-8y^2=0$ represents**

1) Real and distinct lines 2) Coincident lines
3) Imaginary lines 4) Parallel lines

56. **If a,h,b are in A.p then the triangle area formed by the pair of lines $ax^2+2hxy+by^2=0$ and the line $x-y=-2$ in square units**

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

57. **The pair of straight lines $h\left(x^2-y^2\right)+pxy=0$ bisects the angle between the pair of lines $ax^2+2hxy+by^2=0$ then the value of p is**

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

58. **The angle between the lines joining the origin to the point of intersection of $lx+my=1$ and $x^2+y^2=a^2$ is**

1) $\frac{\pi}{2}$ 2) $\frac{\pi}{4}$ 3) $\cos^{-1}\left(\frac{1}{a\sqrt{l^2+m^2}}\right)$ 4) $2\cos^{-1}\left(\frac{1}{a\sqrt{l^2+m^2}}\right)$

59. **The centroid of the triangle formed by the pair of straight lines $12x^2-20xy+7y^2=0$ and the line $2x-3y+4=0$ is**

1) $\left(\frac{-7}{3},\frac{7}{3}\right)$ 2) $\left(\frac{-8}{3},\frac{8}{3}\right)$ 3) $\left(\frac{8}{3},\frac{8}{3}\right)$ 4) $\left(\frac{4}{3},\frac{4}{3}\right)$

60. **If $x^2+4xy+y^2=0$ represents two sides of ΔOAB and the orthocentre is $(-1,-1)$ then the third side is**

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

61. **The perpendicular distance from (a,b,c) to the $z-axis$ is**

1) $\sqrt{a^2+b^2+c^2}$ 2) $\sqrt{b^2+c^2}$ 3) b^2+c^2 4) $\sqrt{a^2+b^2}$

62. **The number of octants in which z co-ordinate is positive is**

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

63. **The point which is equidistance from the points $(a,o,o)(o,b,o)(o,o,c)$ is**

1) (a,b,c) 2) $\left(\sqrt{a},\sqrt{b},\sqrt{c}\right)$ 3) $(2a,2b,2c)$ 4) $\left(\frac{a}{2},\frac{b}{2},\frac{c}{2}\right)$

64. **If $A=(1,2,3)\,B=(2,3,4)$ and c is a point of trisection of AB such that $C_x+C_y=\frac{13}{3}$ then $C_z=$**

1) $\frac{10}{3}$ 2) $\frac{11}{3}$ 3) $\frac{11}{2}$ 4) 11

65. **If $A=(2,4,5)$ and $B=(3,5,-4)$ are two points. If the $xy-plane$, $yz-plane$ divide AB in the ratios $a:b$, $p:q$ respectively then $\frac{a}{b}+\frac{p}{q}=$**

1) $\frac{23}{12}$ 2) $\frac{-7}{12}$ 3) $\frac{7}{12}$ 4) $\frac{-22}{15}$

66. **The locus of the point $(r\cos\alpha\cos\beta, r\cos\alpha\sin\beta, r\sin\alpha)$ where α,β are variables and r is a constant is**

1) $x+y+z=r$ 2) $x^2+y^2+z^2=r^2$
3) $x^2+y^2+z^2=r$ 4) $x^2+y^2-z^2=r^2$

67. **If the direction cosines of a line are $\left(\frac{1}{c},\frac{1}{c},\frac{1}{c}\right)$ then c =**

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

68. **If a line makes angles $45^0,60^0$ with oy,oz respectively where $o=(0,0,0)$ then the line sine of the angle made by that line with ox is**

1) 60^0 2) $\frac{1}{2}$ 3) $\frac{\sqrt{3}}{2}$ 4) $\sqrt{3}$

69. **The direction cosines of the line passing through $P(2,3,-1)$ and the origin are**

1) $\left(\frac{2}{\sqrt{14}},\frac{3}{\sqrt{14}},\frac{1}{\sqrt{14}}\right)$ 2) $\left(\frac{2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{1}{\sqrt{14}}\right)$

3) $\left(\frac{-2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{1}{\sqrt{14}}\right)$ 4) $\left(\frac{2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{-1}{\sqrt{14}}\right)$

70. **If $\frac{1}{2},\frac{1}{2},n(n<0)$ are the dc's of line then the angle made by that line with oz where $o=(0,0,0)$ is**

1) $\frac{-1}{\sqrt{2}}$ 2) 45^0 3) 60^0 4) 135^0

71. **The dc's of two lines are $\frac{\sqrt{3}}{4},\frac{1}{4},\frac{\sqrt{3}}{2}$ and $\frac{\sqrt{3}}{4},\frac{1}{4},k$. If the angle between the lines is 120^0 then $k=$**

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

72. **If $AB\perp BC$ then the value of 'k' = where $A(2k,2,3)B(k,1,5)C(3+k,2,1)$**

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

73. **If $A(2,4,5)B(-7,-2,8)$ are collinear points then C =**

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

74. **The angle between the lines whose direction cosines are $\left(\frac{\sqrt{3}}{4},\frac{1}{4},\frac{\sqrt{3}}{2}\right)$ and $\left(\frac{\sqrt{3}}{4},\frac{1}{4},\frac{-\sqrt{3}}{2}\right)$ is**

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

75. **The dc's of the normal to the plane $2x-y+2z+5=0$ are**

1) $(3,-2,6)$ 2) $\left(\frac{2}{7},\frac{3}{7},\frac{-6}{7}\right)$ 3) $\left(\frac{3}{7},\frac{-2}{7},\frac{6}{7}\right)$ 4) $\left(\frac{2}{3},\frac{-1}{3},\frac{2}{3}\right)$

76. **The distance between the planes $2x-3y+6z+12=0$ and $2x-3y+6z-2=0$ is**

1) $\frac{10}{7}$ 2) $\frac{2}{7}$ 3) 2 4) $\frac{24}{7}$

77. **The foot of perpendicular from point $P(1,3,4)$ to the plane $2x-y+z+3=0$ is**

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

78. **If the perpendicular distance from $(1,2,4)$ to the plane $2x+2y-z+k=0$ is 3 then k – 4 =**

1) 0 2) 11 3) 3 4) 7

79. **If the planes $x+2y+kz=0$ and $2x+y-2z=0$ are at right angles, then the values of k is**

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

80. **Equation of plane whose intercepts are 1, 2, 3 is**

1) $6x+2y+3z=1$ 2) $x+y+z=6$

3) $6x+3y+2z=6$ 4) $6x-3y-2z=1$

PHYSICS

SYLLABUS: Motion on horizontal and inclined planes , work, power & energy – Complete; System of particles: centre of mass, circular motion, couple & Torque, motion in a vertical circle

81. **A body is projected along a rough horizontal surface with a velocity 6 m/s .if the body comes to rest after travelling a distance 9m, the coefficient of sliding friction $\left[g=\mu(mg)\right]s$**

1) 0.5 2) 0.6 3) 0.4 4) 0.2

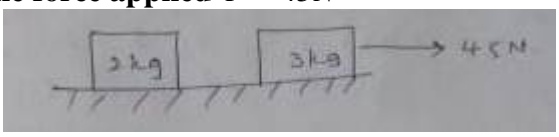
82. **Two bodies having the same mass, 2kg each have different surface areas $50m^2$ and $100m^2$ in contact with a horizontal plane. If the coefficient of friction is 0.2, the force of friction that come into play, when they are in motion will be in the ratio**

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

83. **A body of mass 5kg rests on a rough horizontal surface of coefficient of friction 0.2. The body is pulled through a distance of 10m by a horizontal force of 25N. The kinetic energy acquired by it is**

1) 200 J 2) 150 J 3) 100 J 4) 50 J

84. **Two blocks of masses 2 kg and 3 kg are connected by a light string as shown in the figure and placed on a horizontal surface 'μ' between all surface is 0.1 and $g=10m/s^2$. The acceleration of the system is when the force applied $F=45N$**

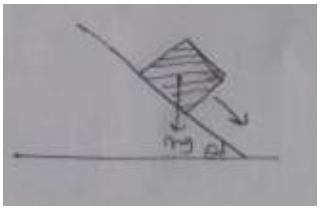


1) $8m/s^2$ 2) $6m/s^2$ 3) $10m/s^2$ 4) $4m/s^2$

85. **When a car of ass 1000kg is moving with a velocity of 20m/s on a rough horizontal road, its engine is switched off. How far does the car move before it comes to rest if the coefficient of kinetic friction between the road and tyres of the car is 0.75?**

1) 20.00m 2) 32.51m 3) 26.67m 4) 36.92m

86. **A planes with a box on it at one end is gradually raised about the other end. As the angle of inclination with the horizontal reached 30^0, the box starts to slip and slides 4m down the plank in 4sec. the coefficient of static and kinetic friction between the box and the plan K will be respectively.**



1) 0.5 and 0.6 2) 0.4 and 0.3 3) 0.6 and 0.6 4) 0.6 and 0.5

87. **Consider a friction less ramp on which a smooth object is made to slide down from an initial height 'h' the distance 'd' necessary to stop the object on a flat track (of coefficient of friction μ) Kept at the ramp end is**

1) $\frac{h}{\mu}$ 2) μh 3) $\mu^2 h$ 4) $h^2\mu$

88. **A body of mass 5 kg is placed on a rough horizontal surface of coefficient of static friction $\frac{1}{3}$. The least pulling force to be applied on the body at an angle 45^0 with the horizontal to slide it is $\left(g = 10m/s^2\right)$**

1) $25\sqrt{2}N$ 2) $\frac{25}{\sqrt{2}}N$ 3) $50\sqrt{2}N$ 4) $\frac{75}{\sqrt{2}}N$

89. **A body is sliding down an inclined plane having coefficient of friction 0.5. If the normal reaction is twice that of the resultant downward force along the incline, the angle between the inclined plane and the horizontal is**

1) 15^0 2) 30^0 3) 45^0 4) 60^0

90. **A given object taken n times to slide down 45^0 rough inclined plane as it taken to slide down a perfectly smooth 45^0 incline. The coefficient of kinetic friction between the object and the incline is**

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

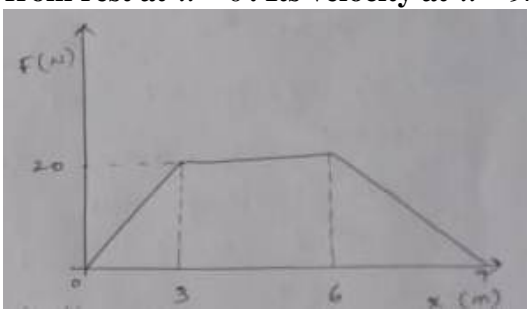
91. **A particle is moving along a horizontal circle of radius 'r' under a centripetal force $\frac{-c}{r^2}$ where 'c' is a constant. Then the total energy of the particle is**

1) $\frac{-c}{2r^2}$ 2) $\frac{c}{2r}$ 3) $\frac{-c}{2r}$ 4) $\frac{c}{2r^2}$

92. **A ball at rest is dropped from a height of 12m. it looses 25% of its kinetic energy on striking the ground and bounces back to a height 'h'. Then value of 'h' is**

1) 3m 2) 6m 3) 9m 4) 12m

93. **A body of mass 2.4kg is subjected to a force. Which varies with distance as shown in the figure. The body starts from rest at $x = 0$. Its velocity at $x = 9m$ is**



1) $5\sqrt{3}m/s$ 2) $20\sqrt{3}m/s$ 3) $10m/s$ 4) $40m/s$

94. **A bomb moving with velocity $\left(40i+50j-25k\right)m/s$ explode into pieces of mass ratio 1 : 4. After explosion the smaller piece moves away with velocity $\left(200i+70j+15k\right)m/s$. The velocity of larger piece after explosion is**

1) $45j-35k$ 2) $45i-35j$ 3) $45k-35j$ 4) $35i+45k$

95. **The momentum of a body is 20000 dyne-sec. Its K.E is 200erg. The mass of the body is**

1) 100 kg 2) 200 kg 3) 2000 kg 4) 1000 kg

96. **It is formed that if a neutron suffers an elastic collinear collision with deuterium at rest, fractional loss of its energy is P_d; while for its similar collision with carbon nucleus at rest, fractional loss of energy is P_c. The values of P_d and P_c are respectively**

1) $\left(0.28,0.89\right)$ 2) $\left(0,0\right)$ 3) $\left(0,1\right)$ 4) $\left(0.89,0.28\right)$

97. **Sand is falling on a conveyor belt at the rate of 5kg/s. the extra power required to move the belt with a velocity of 6m/s is**

1) 30 W 2) 180 W 3) 150 W 4) 1.2 W

98. Calculate the power of an engine which can pull a mass of 500 metric ton up an incline rising 1 in 100 with a velocity of 10m/s is

1) 490 KW 2) 230 KW 3) 320 KW 4) 560 KW

99. A sphere of mass 0.3 kg moving with velocity of 4m/s collides with another sphere of mass 0.5 kg. Which is at rest assuming the collisim to be elastic, their velocity after the impact are

1) 4m/s and 0 m/s 2) -1 m/s and 3 m/s 3) 2 m/s and 2 m/s 4) 4 m/s and 8 m/s

100. 10 bullets each of mass 10gm are fired in succession into a block of mass 450gm at rest. If velocity of each bullet is 110 m/s and all the bullets are embeded in the block, the velocity of the block is

1) 5 m/s 2) 10 m/s 3) 15 m/s 4) 20m /s

101. A block of wood of mass 9.8 kg is suspended by a string. A bullet of mass 200gm strikes horizontally with a velocity of 100 m/s and gets embeded in it. To what height will the block rise (g= 10 m/s)

1) 0.1 m 2) 0.2 m 3) 0.3 m 4) 0

102. A force acts in a 30gm particle in such a way that position if the particle as a function of time is given by $x = 3t - 4t^2 + t^3$, where x is in meters and t is in sec. the work done during the first 4 sec is

1) 5.28J 2) 6.9J 3) 530J 4) 4.3J

103. A ball A moving with a certain velocity collides with another ball B of the same mass at rest. If the coefficient of restitution is e. the ratio of the velocity of A and B after collision is

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

104. A particle A of mass M and initial velocity V collides with a particle B of mass $\frac{m}{2}$ which is at rest the collision is head on and elastic. The ratio of the de-Broglie wavelength λ_A and λ_B after the collision is

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

105. The work done in moving an object along a vector $\bar{s} = (2i + 3j + 5k)m$ is 48J. Then the force acting on it in newton's is

1) $2i + 3j + 7k$ 2) $2i + 7j + 3k$ 3) $3i + 2j + 7k$ 4) $7i + 2j + 3k$

106. If n particle of masses 1, 2, 3,…. Are placed at points at distance 1, 2, 3… from the origin of co-ordinates on the $x - axis$, then find the distance of centre of mass from the origin

1) $\frac{n+1}{3}$ 2) $\frac{2n}{9}$ 3) $\frac{n+2}{3}$ 4) $\frac{2n+1}{3}$

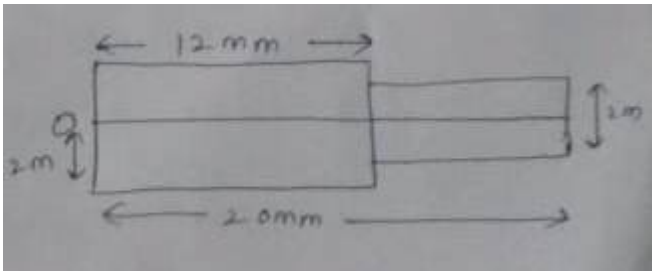
107. Two uniform solid spheres of same material and of radio 6cm and 3cm are firmly united. Find the distance of centre of mass of the system from the centre of large sphere

1) 1cm 2) 2cm 3) 3cm 4) 5cm

108. A 2kg mass and a 3kg mass are moving along a straight line in the same direction. At a certain instant 2kg mass is at 1m from the origin with a velocity of 3 m/s and 3kg mass is at 2m from origin with a velocity of 1m/s. find the velocity of centre of mass of two body system

1) 2.8m/s 2) 3m/s 3) 1m/s 4) 1.8 m/s

109. A machine part constant of two homogeneous slid cylinders coaxially. Then find the distance of centre of mass from O



1) $\frac{9}{16}mm$ 2) $\frac{52}{7}mm$ 3) $\frac{15}{7}mm$ 4) $\frac{12}{7}mm$

110. If a bomb blasts in air and is broken into several places, then the path travelled by centre of mass will be

1) Parabolic 2) Straight line 3) Circular 4) Random

111. Two particle of masses in the ratio 1 : 2 are moving in circle of radii in the ratio 2 : 3 with time period in the ratio 3:4. The ratio of their centripetal forces is

1) 9 : 4 2) 1 : 4 3) 9 : 16 4) 16 : 27

112. A stationary wheel starts rotating about its own axis at constant angular acceleration. If the wheel complete 50 rotations in first 2seconds then the number of rotations made by it in next two seconds is

1) 75 2) 100 3) 125 4) 150

113. The angular displacement of a particle is given by $\theta = t^3 + t^2 + t + 1$ then, its angular velocity at $t = 2\sec$ is _____ rad/s

1) 27 2) 17 3) 11 4) 16

114. If force vector is along $x-axis$ and radius vector is along $y-axis$ then the direction of torque is

1) along +ve $Z-axis$
2) along -ve $Z-axis$
3) In x, y plane making an angle 45^0 with $x-axis$
4) In x, y plane making an angle 135^0 with $x-axis$

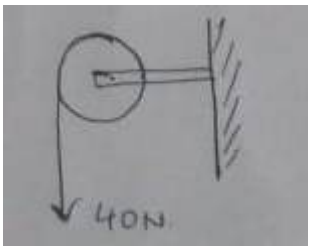
115. A circular disc is rotating about its own natural axis. A constant opposing torgue 2.75Nm is applied on the disc due to which it comes to rest in 28 rotation. If moments of inertia of disc is $0.5kg\ m^2$, the initial angular velocity of disc is

1) 210 rpm 2) 280 rpm 3) 360 rpm 4) 420 rpm

116. A pulley of radius 2m is rotated about its axis by a force $F = 20t - 5t^2$. Newton (where t is measured in seconds) applied tangentially. If the moment of inertia of the pulling about its axis of rotation is $10kg\ m^2$, the number of rotations made by the pulley before its direction of motion is reversed is

1) Less than 3 2) More than 3 but less than 6
3) More than 6 but less than 9 4) More than 9

117. A wheel of radius 0.4 m can rotate freely about its axis as shown in the figure. A string is wrapped over its rim and pulled with 40 N. An angular acceleration of $8rad/s^2$ is produced in it due to the torque hen moment of inertia of the wheel is



1) $2kg-m^2$ 2) $1kg-m^2$ 3) $4kg-m^2$ 4) $8kg-m^2$

118. A particle is moving along vertical circle at radius R inside smooth hollow sphere. If V_1 and V_2 are velocities of particle at the highest and lowest points of vertical circle respectively, then following expression is true

1) $V_2^2 - V_1^2 = 2gR$ 2) $V_2^2 - V_1^2 = 3gR$ 3) $V_2^2 - V_1^2 = 4gR$ 4) $V_2^2 - V_1^2 = 6gR$

119. A body is tied at the end of a string of length 'L' and revolved in a vertical circle the string is just taut when the body is at the highest position velocity of the body when the string is horizontal

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

120. A fly- over bridge is a part of vertical circle of radius 80m and a vehicle is traveling on it. The vehicle does not leave the surface of bridge at its highest points if maximum speed of vehicle is

1) 14m/s 2) 21m/s 3) 28m/s 4) 42 m/s

CHEMISTRY

SYLLABUS: Stoichiometry, States of matter, Chemical Equilibrium, Acid and Bases

121. The % of copper and oxygen in samples of CuO obtained by different methods were found to be the same. This proves the law of

1) Constant proportion 2) Reciprocal proportion
3) Multiple proportion 4) Conservation of mass

122. The number of significant figures in $No = 6.022\times10^{23}$ (A Vogadro's are)

1) 3 2) 4 3) 5 4) All

123. The mass of $112cm^3$ of CH_4 at STP

1) 0.16 gr 2) 0.08 gr 3) 0.8gr 4) 16 gr

124. The vapour density of a tribasic acid is X. the equivalent mass of that acid is

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

125. A certain compound contains Ca, C, N in the mass ratio $20:6:14$. The empirical formula of the compound is

1) $CaCN$ 2) CaC_2N 3) $CaC_2(CN)_2$ 4) $CaCN_2$

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

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

127. Normality of 2% of H_2SO_4 solution by volume is nearly

1) 2 2) 4 3) 0.2 4) 0.4

128. The weight of SO_2 formed when 20gr of sulphur is burnt in excess of O_2 **is**

1) 32gm 2) 64gm 3) 40gm 4) 60gm

129. The atomic mass of a metal M is 56, then the empirical formulae of its oxide containing 70% metal

1) MO 2) M_2O_3 3) M_3O_2 4) M_3O_5

130. The volume of water to be added to 400ml of $\frac{N}{8}HCl$ to make it exactly $\frac{N}{12}$ is

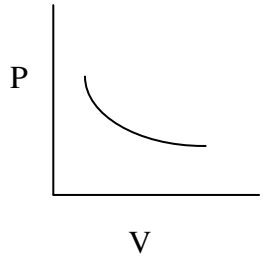
1) 400ml 2) 300 ml 3) 200ml 4) 100ml

131. Dipole – dipole interaction energy between rotating polar molecules is proportional to

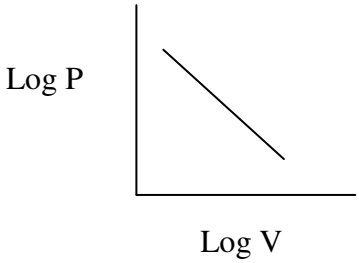
1) r^3 2) $\frac{1}{r^3}$ 3) $\frac{1}{r^6}$ 4) r^6

132. Which curve does not represent Boyle's law?

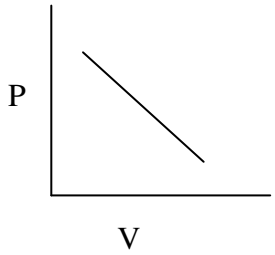
1)



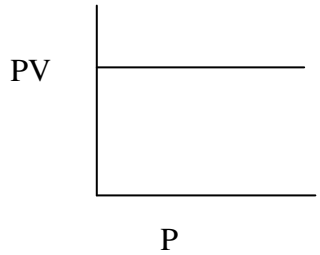
2)



3)



4)



133. A gas mixture contains Nitrogen and methane in $7:4$ ratio by weight. The ratio of their molecule is

1) $7:4$ 2) $4:7$ 3) 1: 1 4) 1 : 2

134. The correct order of diffusion for the gases H_2, N_2, O_2 and NH_3 is

1) $H_2 > N_2 > O_2 > NH_3$ 2) $NH_3 > O_2 > N_2 > H_2$

3) $H_2 > N_2 > NH_3 > O_2$ 4) $H_2 > NH_3 > N_2 > O_2$

135. The K.E of amole of ideal gas in calories is approximately equal to

1) 3 times its absolute temperature 2) 2 times its absolute temperature

3) 4 times its absolute temperature 4) $\frac{2}{3}$ times its absolute temperature

136. At 300K the no. of molecules possessing most probable velocity are 100. At 400K the numbers of molecules possessing most probable velocity are

1) 90 2) 100 3) 110 4) 120

137. Equal masses of SO_2 and O_2 are kept in a vessel at 27^0C. The total pressure of the mixture is 2.1 atm. The partial pressure of SO_2 is

1) 1.4atm 2) 7atm 3) 0.7atm 4) 14atm

138. The compressibility factor for a real gas at high pressure is

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

139. As temperature increases, surface tension

1) Decreases 2) Increases

3) Remains constant 4) First increases and remains constant

140. Density of gas is found to be $5.46 gr/dm^3$ at 27^0C at 2 bar pressure. The density of the same gas at STP is

1) $2 gr/dm^3$ 2) $5 gr/dm^3$ 3) $4 gr/dm^3$ 4) $3 gr/dm^3$

141. The equilibrium constant for the reaction $A \rightleftharpoons B$ is K. The equilibrium constant for the reaction $mA \rightleftharpoons mB$ is

1) mK 2) K/m 3) K^m 4) K^{-m}

142. The active mass of 64gr of HI in a 2L it flask would be

1) 2 2) 1 3) 5 4) 0.25

143. For $\underset{(g)}{A_2} + \underset{(g)}{B_2} \underset{K_b=15}{\overset{K_f=5}{\rightleftharpoons}} 2AB$ K_C for $\underset{(g)}{2AB} \rightleftharpoons \underset{(g)}{A_2} + \underset{(g)}{B_2}$ is

1) 3 2) 75 3) $\sqrt{3}$ 4) $\frac{1}{\sqrt{3}}$

144. Backward reaction is favored by increase in the pressure of the equilibrium

1) $2SO_2 + O_2 \rightleftharpoons 2SO_3$ 2) $N_2 + O_2 \rightleftharpoons 2NO$

3) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ 4) $PCl_5 \rightleftharpoons pCl_3 + Cl_2$

145. The equilibrium of the reaction $\underset{(g)}{N_2} + \underset{(g)}{3H_2} \rightleftharpoons \underset{(g)}{2NH_3}$ will shift to the product side when

1) $K_P > 1$ 2) $Q < K_P$ 3) $Q = K_P$ 4) $Q > K_P$

146. The equilibrium constant K_P for the reaction $\underset{(S)}{NH_4HS} \rightleftharpoons \underset{(g)}{NH_3} + \underset{(g)}{H_2S}$ is

1) $K_P = \dfrac{P_{NH_3} \times P_{H_2S}}{P_{NH_4}H_S}$ 2) $K_P = \dfrac{P_{NH_4}H_s}{P_{NH_3} \times P_{H_2S}}$

3) $K_P = P_{NH_4}H_S$ 4) $K_P = P_{NH_3} \times P_{H_2S}$

147. At a certain temperature $PCl_5 \rightleftharpoons PCl_3 + Cl_2$ only 50% PCl_5 is dissociated in a 1 litre vessel at equilibrium. The equilibrium constant is

1) 0.25 2) 0.3 3) 0.5 4) 1.0

148. For a reaction $\underset{(g)}{2NOCl} \rightleftharpoons \underset{(g)}{2NO} + \underset{(g)}{Cl_2}$, K_C at 427^0C is $3\times10^{-6}2mol^{-1}$, the value of K_P is nearly

1) 7.5×10^{-5} 2) 2.5×10^{-5} 3) 2.7×10^{-4} 4) 1.72×10^{-4}

149. In this dissociation of PCl_5 as $\underset{(g)}{PCl_5} \rightleftharpoons \underset{(g)}{PCl_3} + \underset{(g)}{Cl_2}$. If the degree of dissociation is α at equilibrium constant for the reaction is

1) $K_P = \dfrac{\alpha^2}{1+\alpha^2 P}$ 2) $K_P = \dfrac{\alpha^2 P^2}{1+\alpha^2}$ 3) $K_P = \dfrac{P^2}{1-\alpha^2}$ 4) $K_P = \dfrac{\alpha^2 P}{1-\alpha^2}$

150. The equilibrium constant for the given reaction is 100 $\underset{(g)}{N_2} + \underset{(g)}{2O_2} \rightleftharpoons \underset{(g)}{2NO_2}$ what is the equilibrium constant for the reaction given below?

$$\underset{(g)}{NO_2} \rightleftharpoons \frac{1}{2}\underset{(g)}{N_2} + \underset{(g)}{O_2}$$

1) 10 2) 1 3) 0.1 4) 0.01

151. Which of the following is the conjugate base of $\left[C_2H_5NH_3\right]^+$?

1) $\left[C_2H_5NH\right]^-$ 2) $\left[C_6H_5NH_3\right]OH$ 3) $\left[C_2H_5NH_2\right]$ 4) $C_2H_5NH_2^+$

152. For

$$H_3PO_4, H_3PO_4 \rightleftharpoons H_2PO_4^- + H^+\left(K_1\right)$$
$$H_2PO_4^- \rightleftharpoons HPO_4^{-2} + H^+\left(K_2\right)$$
$$HPO_4^{-2} \rightleftharpoons PO_4^{-3} + H^+\left(K_3\right)$$

1) $K_1 > K_2 > K_3$ 2) $K_1 < K_2 < K_3$ 3) $K_1 = K_2 = K_3$ 4) $K_1.K_2.K_3 = K_W$

153. How many H^+ ions are present in 10ml of a solution having $P^H = 10$?

1) 10^{10} `2) 10^{-10} 3) 6.02×10^{23} 4) 6.02×10^{11}

154. The P^{Ka} weak acid is 4.8 what is the ratio of salt of acid. If P^H of buffer is 5.8 is to be prepared

1) 1 : 1 2) 1 : 10 3) 10 : 1 4) 2 :1

155. A 0.01M ammonia solution is 5% ionized, the concentration of OH^- ions is

1) 0.005M 2) 0.0001M 3)0.0005M 4) 0.05M

156. The solubility of $AgCl$ in 0.1M $NaCl$ is $\left(K_{SP}\ of\ AgCl = 1.2\times10^{-10}\right)$

1) 0.05M 2) 1.2×10^{-6} 3) 2×10^{-5} 4) 1.2×10^{-9}

157. The hydrolysis constant of ammonium acetate is given by

1) $\dfrac{K_w}{K_a}$ 1) $\dfrac{K_w}{K_b}$ 3) $\dfrac{K_w}{K_a.K_b}$ 4) $\dfrac{K_a.K_b}{K_w}$

158. K_h **of salt obtained from strong acid and weak base is** 2×10^{-5}**. The** K_b **of weak base is**

1) 2×10^{-19} 2) 5×10^{-10} 3) 2×10^{-10} 4) 5×10^{-9}

159. The P^H **of** $NaOH$ **solution is 12. What is the amount in grams of** $NaOH$ **present in one liter of a solution?**

1) 40 2) 4 3) 0.4 4) 20

160. For the electrolyte of type A_2B, K_{SP} **is given then its solubility is calculated by**

1) $\frac{K_{SP}}{4}$ 2) $\sqrt[3]{\frac{K_{SP}}{4}}$ 3) $\sqrt[3]{K_{SP}}$ 4) $\frac{K_{SP}}{4}$

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SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

SR MPC | **EAMCET MODEL** | **Date: 15-04-2020**

Time: 3 Hours | **Max. Marks: 160**

KEY SHEET

MATHS - A

1) **2** 2) **1** 3) **1** 4) **2** 5) **4** 6) **2** 7) **3** 8) **2** 9) **2** 10) **2**

11) **4** 12) **3** 13) **2** 14) **3** 15) **4** 16) **4** 17) **2** 18) **2** 19) **3** 20) **2**

21) **2** 22) **4** 23) **1** 24) **3** 25) **1** 26) **1** 27) **2** 28) **2** 29) **3** 30) **3**

31) **4** 32) **3** 33) **3** 34) **4** 35) **4** 36) **2** 37) **4** 38) **3** 39) **4** 40) **1**

MATHS – B

41) **1** 42) **3** 43) **3** 44) **2** 45) **4** 46) **4** 47) **4** 48) **3** 49) **4** 50) **1**

51) **4** 52) **4** 53) **2** 54) **4** 55) **1** 56) **3** 57) **2** 58) **4** 59) **3** 60) **2**

61) **4** 62) **3** 63) **4** 64) **2** 65) **3** 66) **2** 67) **3** 68) **3** 69) **3** 70) **4**

71) **4** 72) **3** 73) **3** 74) **3** 75) **4** 76) **2** 77) **1** 78) **3** 79) **4** 80) **3**

PHYSICS

81) **4** 82) **1** 83) **2** 84) **1** 85) **3** 86) **4** 87) **1** 88) **2** 89) **3** 90) **2**

91) **3** 92) **3** 93) **3** 94) **1** 95) **4** 96) **4** 97) **2** 98) **1** 99) **2** 100) **4**

101) **2** 102) **1** 103) **4** 104) **1** 105) **1** 106) **4** 107) **1** 108) **4** 109) **2** 110) **1**

111) **4** 112) **4** 113) **2** 114) **2** 115) **4** 116) **2** 117) **1** 118) **3** 119) **4** 120) **3**

CHEMISTRY

121) **1** 122) **2** 123) **2** 124) **3** 125) **4** 126) **2** 127) **4** 128) **3** 129) **2** 130) **3**

131) **3** 132) **3** 133) **3** 134) **4** 135) **1** 136) **1** 137) **3** 138) **3** 139) **1** 140) **1**

141) **3** 142) **4** 143) **1** 144) **4** 145) **2** 146) **4** 147) **3** 148) **4** 149) **4** 150) **3**

151) **3** 152) **1** 153) **4** 154) **3** 155) **3** 156) **4** 157) **3** 158) **2** 159) **3** 160) **2**

HINTS & SOLUTIONS

MATHS- A

1. $\alpha+\alpha+4\alpha=180^0 \Rightarrow 6\alpha=180^0$

$\alpha=30^0$

$30, 30, 120$

$a=2R\sin 30^0=R$

$b=2R\sin 30^0=R$

$b=2R\sin 30^0=R$

$2S:c=2R+\sqrt{3}R:\sqrt{3}R=2+\sqrt{3}:\sqrt{3}$

2. $\cos A+\cos C=2(1-\cos B)$

$$2\cos\left(\frac{A+C}{2}\right)\cos\left(\frac{A-C}{2}\right)=2.2\sin^2\frac{B}{2}$$

$$\frac{\cos\left(\frac{A-C}{2}\right)}{\sin\left(\frac{B}{2}\right)}=2$$

3. $$2S\left[\frac{(s-b)(s-c)}{\Delta}+\frac{(s-a)(s-c)}{\Delta}\right]$$

$$2S\left(\frac{s-c}{\Delta}\right)(c)=2c\cot\left(\frac{c}{2}\right)$$

4. $$\frac{1}{b+c}+\frac{1}{c+a}=\frac{3}{a+b+c}$$

$\Rightarrow \angle C=60^0$

5. $8R^2\left(\sin^2 A\sin C\cos C+\sin^2 C\sin A\cos A\right)$

$=8A^2\sin A\sin B\sin C=4\Delta$

6. $x=2a,\ y=2b,\ z=2c$

$x+y+z=2(a+b+c)=45$

$\Delta=\sqrt{(2s-2a)(2s-2b)(2s-2c)2s}$

$=4\Delta$

7. $a=2\left(\sqrt{3}+1\right), B=45^0, C=60^0$

$\Rightarrow A=75^0$

$$\frac{a}{\sin A}=\frac{b}{\sin B}\Rightarrow\frac{2\left(\sqrt{3}+1\right)}{\left(\frac{\sqrt{3}+1}{2\sqrt{2}}\right)}=\frac{b}{\left(\frac{1}{\sqrt{2}}\right)}$$

$\Rightarrow b=4$

$$\Delta=\frac{1}{2}ab\sin c$$

$$=\frac{1}{2}2\left(\sqrt{3}+1\right)4\times\frac{\sqrt{3}}{2}=2\left(3+\sqrt{3}\right)$$

8. $a=6,\ b+c=10$

$\Delta^2=s(s-a)(s-b)(s-c)$

$144=8(2)\left(s^2-s(b+c)+bc\right)$

$64-8(10)+bc=9 \Rightarrow bc=25$

$b=c=5$

9. $r_1=8, r_2=12, r_3=24$

$\frac{1}{r}=\frac{1}{r_1}+\frac{1}{r_2}+\frac{1}{r_3} \Rightarrow r=4$

$\Delta^2=rr_1r_2r_3$

$\Delta=96$

$s=\frac{\Delta}{r}=\frac{96}{4}=24$

Using $r_1=\frac{\Delta}{s-a}, r_2=\frac{\Delta}{s-b}, r_3=\frac{\Delta}{s-c}$

$\Rightarrow a=12, b=16, c=20$

10. $r=1, \Delta=6, s=6$

$r_1=\frac{\Delta}{s-a} \Rightarrow a=3$

11.

$\frac{s^2+(s-a)^2+(s-b)^2+(s-c)^2}{\Delta^2}$

$=\frac{a^2b^2+c^2}{\Delta^2}$

12. $\cos^2 A-\cos^2 c$

$=\left[\frac{b^2+c^2-a^2}{2bc}\right]^2-\left[\frac{a^2+b^2+c^2}{2ba}\right]^2$

$=\left[\frac{3+\sqrt{3}}{\sqrt{6}(\sqrt{3}+1)}\right]^2-\left[\frac{3-\sqrt{3}}{2\sqrt{6}}\right]^2$

$=\left[\frac{1}{\sqrt{2}}\right]^2-\left[\frac{\sqrt{3}-1}{2\sqrt{2}}\right]^2=\frac{\sqrt{3}}{4}$

13. $\alpha=\frac{2\Delta}{a}, \beta=\frac{2\Delta}{b}, \gamma=\frac{2\Delta}{c}$

$\alpha^{-2}+\beta^{-2}+\gamma^{-2}=\frac{1}{\alpha^2}+\frac{1}{\beta^2}+\frac{1}{\gamma^2}=\frac{a^2+b^2c^2}{4\Delta^2}$

$=\frac{4\Delta[\cot A+\cot B+\cot C]}{4\Delta^2}$

$=\frac{1}{\Delta}[\cot A+cotB+\cot C]$

14. $\frac{a}{2\Delta}+\frac{b}{2\Delta}-\frac{c}{2\Delta}=\frac{2(s-c)}{2\Delta}$

Verify the options

15. $2R\sin^2 A=2R\sin^2 B \Rightarrow \sin A=\sin B$

16. $a=2x, b=3x, c=4x$

$S=\frac{9x}{2}, \Delta=\frac{3x^2\sqrt{15}}{4}$

$R:r=\frac{abc}{4\Delta};\frac{\Delta}{S}=16:5$

17. $3-4\sin^2 B=\frac{\left(a^2-c^2\right)^2}{4a^2c^2}$

$3-4\left(1-\cos^2 B\right)=\frac{\left(a^2-c^2\right)}{4a^2c^2}$

$4\cos^2 B=\frac{\left(a^2+c^2\right)^2}{4a^2c^2},\ 2\cos B=\frac{a^2+c^2}{2ac}$

$\frac{a^2+c^2-b^2}{ac}=\frac{a^2c^2}{2ac}\Rightarrow a^2+c^2=2b^2$

18. $\cos c=\frac{b}{\frac{a}{2}}$

$\frac{a^2+b^2-c^2}{2ac}=\frac{2b}{a}\Rightarrow a^2-c^2=3b^2$

$3ac=\frac{\left(b^2+c^2-a^2\right)}{2bc}\frac{2b}{a}+2a^2=2c^2$

19. $\cos B=\frac{c}{\frac{a}{2}}$

$\frac{a^2+c^2-b^2}{2ac}=\frac{2c}{a}\Rightarrow a^2-b^2=3c^2$

20. $\cos\theta=\frac{c-a}{b}\Rightarrow\left(c-a\right)\tan\theta=b\sin\theta$

$=b.\frac{2\sqrt{c}a}{b}\sin\frac{B}{2}$

$=2\sqrt{c}a\sin\frac{B}{2}$

21. $\cosh^2 x=14\sinh^2 x\Rightarrow\cosh x=\frac{5}{4}$

$\sinh\left(2x\right)=2\times\frac{3}{4}\times\frac{5}{4}=\frac{15}{8}$

22. $f\left(x\right)=e^x\Rightarrow f\left(x\right)f\left(y\right)=e^xe^y=e^{x+y}=f\left(x+y\right)$

23. $\cosh x=\sec\theta\Rightarrow\frac{1+\tanh^2\frac{x}{2}}{1-\tanh^2\frac{x}{2}}=\frac{\sec\theta}{1}$

$\Rightarrow\tanh^2\frac{x}{2}=\frac{\sec\theta-1}{\sec\theta+1}=\tan^2\frac{\theta}{2}$

24. $x=\tanh^{-1}y=\frac{1}{2}\log\left(\frac{1+y}{1-y}\right)$

$2x=\log\left(\frac{1+y}{1-y}\right)$

25. $\coth^{-1}(x)=\frac{1}{2}\log\left(\frac{x+1}{x-1}\right)$

26. $\frac{1}{2}.\frac{2}{3}....\frac{n}{n+1}=\frac{1}{n+1}$

27. $\sum n(n+1)=\frac{n(n+1)(2n+1)}{6}+\frac{n(n+1)}{2}$

$=n(n+1)\left[\frac{(2n+1)}{6}+\frac{1}{2}\right]$

$=n(n+1)\left[\frac{2n+1+3}{6}\right]=\frac{n(n+1)(n+2)}{3}$

28. $\sum(2n-1)^3$ or put $n=2$ and verify by the options

29. Put $n=1\Rightarrow 2^3-7-1=0$

Put $n=2\Rightarrow 2^6-14-1=49$

Put $n=3\Rightarrow 2^9-21-1=490$

G.C D of $49\ \&\ 490$ is49

30. Put $n=1$, $n=2$ find G.C.D

31. Verification

32. Total functions – one one $4^3-5_{p_3}=64-24$

33. $n!=106!$

34. $f\left(x+\frac{1}{x}\right)=\left(x+\frac{1}{x}\right)^2-2$

$\Rightarrow f(x)=x^2-2$

35. $f(x)=-3$

$\Rightarrow x^2-10^x+24=0\Rightarrow x=4,b$

36. $f^{-1}(1)\Rightarrow\frac{b+2}{1-a}=0\Rightarrow b=-2$

f^{-1} is not defined at $3\Rightarrow 3-a=0,\ a=3$

37. $f\left[f(\cos x)\right]=f\left[\frac{1-\cos x}{1+\cos x}\right]$

$=f\left(\tan^2\frac{x}{2}\right)=\cos x$

38. $f(x)=\frac{-x-1}{x+1}\Rightarrow fofofof(x)=x$

39. $f(x+y)=f(x)f(y)\Rightarrow f(x)=k^x,$

$f(5)=k^5=32\Rightarrow k=2$

$f(7)=128$

40. $f(x)=\frac{4x+3}{5}=y\Rightarrow x=\frac{5y-3}{4}$

$\Rightarrow f^{-1}(x)=\frac{5x-3}{4}$

MATHS- B

41. $m_1 = \tan 30^0$

$m_2 = \tan 60^0$

Equation is $y^2 - (m_1 + m_2)xy + m_1 m_2 x^2 = 0$

42. $\Delta = n^2\sqrt{h^2 - ab}$

$\left|am^2 - 2hlm + bl^2\right|$

43. $\sin\theta = \dfrac{2\sqrt{h^2 - ab}}{\sqrt{(a-b)^2 + 4h^2}}$

44. $h(x^2 - y^2) = (a-b)xy$

45. $a + b = 0$

46. $\dfrac{\left|a\alpha^2 + 2h\alpha\beta + b\beta^2\right|}{\sqrt{(a-b)^2 + 4h^2}}$

47. $\Delta = 0$

48. $\cos\theta = \dfrac{|a+b|}{\sqrt{(a-b)^2 + 4h^2}}$

49. $h(l^2 - m^2) = (a-b)lm$

50. Equation of bisector of angle between them $x^2 - 2pxy - y^2 = 0$ is $px^2 + 2xy - py^2 = 0$ is same as $x^2 - 2qxy - y^2 = 0$

$\therefore \dfrac{p}{1} = \dfrac{1}{-q} = \dfrac{p}{1} \Rightarrow pq = -1$

51. $\dfrac{\partial f}{\partial x} = 0,\ \dfrac{\partial f}{\partial y} = 0$

52. $\dfrac{f^2 + g^2}{a^2 + h^2}$

53. $a + b \neq 0,\ (a-b)fg + h(f^2 - g^2) = 0$

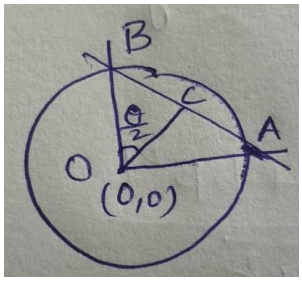
54. $2\sqrt{\dfrac{g^2 - ac}{a(a+b)}}$

55. $h^2 - ab > 0$

56. $2h = a + b$ and apply $\dfrac{n^2\sqrt{h^2 - ab}}{\left|am^2 - 2hm + bl^2\right|}$

57. Compare the equation of pair of angular bisector of first pair with second pair

58. $\cos\left(\dfrac{\theta}{2}\right) = \dfrac{OC}{OB} = \dfrac{\dfrac{1}{\sqrt{l^2 + m^2}}}{a}$



59. Multiplying the option with $\frac{3}{2}$ and put in the given line

60. $(a+b)(x+dy) = ad^2 - 2hcd + bc^2$

61. Conceptual

62. Conceptual

63. Conceptual

64. $C_x + C_y = \frac{13}{3} \Rightarrow AC : CB = 2:1$

65. $a:b = -x_1 : x_2$ and $p:q = -x_1 : x_2$

66. Eliminate α and β

67. Use $l^2 + m^2 + n^2 = 1$

68. $\beta = 45^0, \gamma = 60^0, \alpha = ?$ use $\cos^2\alpha + \cos^2\beta + \cos^2\gamma = 1$

69. Dr's of $op = (2,3,-1)$

Dc's of $op = \left(\frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}}, \frac{-1}{\sqrt{14}}\right) or \left(\frac{-2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{1}{\sqrt{14}}\right)$

70. Use $l^2 + m^2 + n^2 = 1$

$\frac{1}{4} + \frac{1}{4} + \cos^2\gamma = 1$

$\cos^2\gamma = \frac{1}{2}$

$\cos\gamma = \frac{\pm 1}{\sqrt{2}} \Rightarrow \cos\gamma = \frac{-1}{\sqrt{2}}$

$\gamma = 135^0$

71. Use $\cos\theta = l_1 l_2 + m_1 m_2 + n_1 n_2$

72. Given $AB \perp BC \Rightarrow a_1 a_2 + b_1 b_2 + c_1 c_2 = 0$

73. Verification

74. $\cos\theta = \frac{a_1 a_2 + b_1 b_2 + c_1 c_2}{\sqrt{a_1^2 + b_1^2 + c_1^2}\sqrt{a_2^2 + b_2^2 + c_2^2}}$

75. dc's $= \pm\left(\frac{a}{\sqrt{a^2+b^2+c^2}}, \frac{b}{\sqrt{a^2+b^2+c^2}}, \frac{c}{\sqrt{a^2+b^2+c^2}}\right)$

76. $\left|\frac{d_1 - d_2}{\sqrt{a^2+b^2+c^2}}\right|$

77. **Use** $\frac{x-\alpha}{a} = \frac{y-\beta}{b} = \frac{z-\gamma}{c} = \frac{(a\alpha - b\beta - c\gamma + d)}{a^2+b^2+c^2}$

78. $d = \frac{|ax_1 + by_1 + cz_1 + d|}{\sqrt{a^2+b^2+c^2}}$

79. Use $a_1 s_2 + b_1 b_2 + c_1 c_2 = 0$

80. $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1,\ a = 1, b = 2, c = 3$

PHYSICS

81. $\mu = \frac{a}{g}$

From $v^2 - u^2 = 2as$

V = 0 , u = 6 m/s, s = 9m

$o^2 - (6)^2 = 2a(9)$

$a = \frac{-36}{2\times 9}$

$= -2m/s^2 (\text{Re}tardation)$

$\mu = \frac{+2}{10}$

$\mu = 0.2$

82. Force of friction is independent of area of constant

83. Kinetic energy = work done

$[F = \mu(mg)]s$

$[25 - (0.2)50]10$

$K.E = 150J$

84. $F - \mu(m_1 + m_2)g = (m_1 + m_2)a$

$45 - 0.1(2+3)10 = (2+3)a$

$45 - 5 = 5a$

$a = 8m/s^2$

85. **Stopping distance** $s = \frac{V^2}{2\mu_K g}\left[\because V = 20m/s, \mu_k = 0.75, g = 10m/s^2\right]$

$s = 26.67m$

86. $\mu_s = \tan\theta$

$= \tan 30^0$

$\mu_s = 0.6$

$\rightarrow a = g(\sin\theta - \mu_k = \cos\theta)$

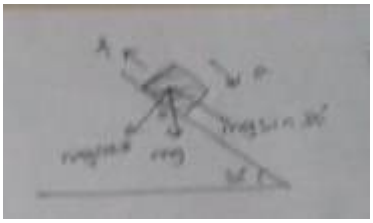
$\left(\because s = ut + \frac{1}{2}at^2\right)$

$4 = 8a$

$a = 0.5m/s^2$

$0.5 = 10\left(\frac{1}{2} - \mu_k \frac{\sqrt{3}}{2}\right)$

$\mu_k = \frac{4.5}{5\sqrt{3}} = 0.5$

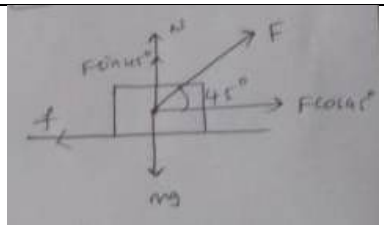


87. $mgh = \mu mgs$

$s = \frac{h}{\mu}$

88. $f = F\cos 45$

$\mu N = F\cos 45$



$\mu(mg - F\sin 45) = F\cos 45$

On solving

$F = \dfrac{\mu mg}{\mu \sin 45 + \cos 45}$

$\dfrac{50\sqrt{2}}{4} = \dfrac{25}{\sqrt{2}} N$

89. Resultant downward force along the incline = $mg(\sin\theta - \mu\cos\theta)$

$N = mg\cos\theta$

$mg\cos\theta = 2mg(\sin\theta - \mu\cos\theta)$

$\theta = 45^0$

90. $t^1 = nt$

$t^1 = \sqrt{\dfrac{2s}{g(\sin\theta - \mu\cos\theta)}}$

$\sqrt{\dfrac{2s}{g(\sin\theta - \mu\cos\theta)}} = n\sqrt{\dfrac{2s}{g\sin\theta}}$

$g\sin\theta = n^2 g(\sin\theta - \mu\cos\theta)$

$\mu = 1 - \dfrac{1}{n^2}$

91. $F_c = \dfrac{-c}{r^2}$

$\dfrac{mv^2}{r} = \dfrac{c}{r^2}[magnitute]$

$KE = \dfrac{c}{2r}$

P.E = $U = -\int F\, dr$

$= \dfrac{-C}{r}$

$T.E = K.E + P.E$

$= \dfrac{c}{2r} - \dfrac{c}{r}$

$TE = \dfrac{-c}{2r}$

92. $mgh = 75\% mg\ h_0$

$h = \dfrac{3}{4} \times 12$

$h = 9m$

93. According to work – energy theorem

$w = \Delta K.E$

$w = 120J$

94. According to law of conservation of momentum $MV = m_1v_1 + m_2v_2$

By solving

$V_2 = 45j - 35k$

95. $K.E = \frac{p^2}{2m}$

$200 = \frac{4\times10^8}{2m}$

$m = 10^3 kg$

96. Fractional loss of energy $= \frac{4m_1m_2}{(m_1+m_2)^2}$

For deuteron $P_d = \frac{4(1)(2)}{(1+2)^2} = 0.89$

For carbon $P_c = \frac{4(1)(12)}{(1+12)^2} = 0.28$

97. $P = F.V$

$P = \frac{mv^2}{t}\left(\because \frac{m}{t}5kg/s\right)$

$= 5\times36(v = 6m/s)$

$P = 180w$

98. $\sin\theta = \frac{1}{100},\ v = 10m/s$

$m = 500\times10^3 kg$

$F = mg\sin\theta$

$49\times10^3 N$

$P = F.V$

$49\times10^3\times10$

$P = 490kw$

99. $V_1 = \frac{(m_1-m_2)u_1}{m_1+m_2} + \frac{2m_2u_2}{m_1+m_2}$

$V_2 = \frac{2m_1u_1}{m_1+m_2} + \frac{(m_2-m_1)u_2}{m_1+m_2}$

$(u_1 = 4m/s, u_2 = 0)$

100. According law of conservation of linear momentum

$p_1 = p_f$

$m_1u_1 + m_2u_2 = (m_1+m_2)V$

$10\times10\times10^{-3}\times110 + 450\times0^{-3}r = 10^{-3}(100+450)v$

$v = 20m/s$

101.

$\left[V_{(bullet)} = \left(\frac{M+m}{m}\right)\sqrt{2gh}\right]$

$V_{bullet} = 100m/s$

$m = 9.8kg, m = 200gm = 200\times10^{-3}kg$

$g = 10 m/s^2 \quad h = ?$

102. $V = \frac{dx}{dt} = 3 - 8t + 3t^2$

At $t = 0; \quad V_1 = 3 m/s$

$t = 4; \; V_2 = 19 m/s$

$w = \frac{1}{2} m v_2^2 - \frac{1}{2} m v_1^2$

$w = 5.28 J$

103. $v_A = \left(\frac{m_1 - e m_2}{m_1 + m_2} \right) u_1$

$v_B = \left(\frac{(1+e) m_1}{m_1 + m_2} \right) u_1$

104. From law concentration of momentum

$mv = m v_1 + \frac{m}{2} v_2$

$e = \frac{v_2 - v_1}{u_1 - u_2}$

$1 = \frac{v_2 - v_1}{v}$

$v_1 = \frac{v}{3}, \; v_2 = \frac{4v}{3}$

$\lambda = \frac{h}{mv}$

$\lambda_A = \frac{3h}{mv}, \; \lambda_B = \frac{3h}{2mv}$

$\frac{\lambda_A}{\lambda_B} = \frac{2}{1}$

105. $w = \overline{F} . \overline{S}$

Compare with the options

106. $X_{cm} = \frac{M_1 X_1 + M_2 X_2 + ...}{m_1 + m_2 + ...}$

$= \frac{\frac{n(n+1)(2n+1)}{6}}{\frac{n(n+1)}{2}}$

$x_{cm} = \frac{2n+1}{3}$

107. $x_{cm} = \frac{r_2^3 (r_1 + r_2)}{r_1^3 + r_2^2}$

108. $V_{cm} = \frac{m_1 v_1 + m_2 v_2}{m_1 + m_2}$

109. $X_{cm} = 6 + \frac{r_1^2 L_2}{r_1^2 L_1 + r_2^2 L_2} \left(\frac{l_1 + l_2}{2} \right)$

110. Conceptual

111. $F = ma$

$$F = mr\left(\frac{2\pi}{T}\right)^2$$

$$F \alpha m,\ r\alpha\frac{1}{T^2}$$

112. $w_1 = 0,\ t = 2\sec$

$\theta = 2\pi n$

$\alpha = \frac{2\theta}{t^2} = \frac{200\pi}{4} = 50\pi\ rad/s^2$

$\theta = 400\pi - 100\pi = 300\pi\ \ rad$

No. of rotation $= \frac{\theta}{2\pi} = \frac{300\pi}{2\pi} = 150$

113. $\omega = \frac{d\theta}{dt}$

$\omega = 3t^2 + 2t + 1$

$\omega = 17 rad/s$

114. Conceptual

115. $\alpha = \frac{\tau}{I},\ w = \sqrt{2\alpha\theta}$

$w = \sqrt{2\times 5.5\times 28\times 2\times n}$

$w = 2\pi n$

$n = 7 rps$

$= \frac{7}{\frac{1}{60}} rpm$

$n = 420\ rpm$

116. $\alpha = \frac{\tau}{I} = \frac{Fr}{I} = \frac{\left(20t - 5t^2\right)^2}{10} = 4t - t^2$

$\alpha = \frac{dw}{dt}$

$w = 2t^2 - \frac{t^3}{3}$

$\theta = \frac{2}{3}t^3 - \frac{t^4}{12}$

Number of rotation $= \frac{36}{2\pi} < 6$

117. $\tau = I\alpha$

$Fr = I\alpha$

$\tau = \frac{Fr}{\alpha}$

118. According to the law of conservation of energy

$\frac{1}{2}m\left(v_2^2 - v_1^2\right) = Mg\left(2R\right)$

$v_2^2 - v_1^2 = 4gR$

119. Conceptual $v = \sqrt{3gL}$

120. $\frac{mv^2}{r} = mg$

$v^2 = gr$

$\sqrt{9.8\times 80}$

$v = 28 m/s$

CHEMISTRY

121. Conceptual

122. Conceptual

123.

$22,400 cm^2 --16 gm$

$112 cm^2 --?$

Mass of $CH_4 = \frac{16\times 112}{22400} = 0.08 gr$

124. Equation mass $= \frac{2\times V.D}{Basicity}$

125. $Ca : C : N = \frac{20}{40} : \frac{6}{12} : \frac{14}{14}$

$= 1:1:2$

126. C_3O_2

O.N of 'C' $= 3(C) + 2(0) = 0$

$= 3(x) + 2(-2) = 0$

$3x = +4$

$x = \frac{-4}{3}$

$C = \frac{-4}{3}$

127. $N = \frac{10\times \%}{G.E.W}$

$N = \frac{10\times 2}{49}$ $\left[G.E.W \text{ of } H_2SO_4 = \frac{98}{2} = 49\right]$

$N = 0.4$

128. $S + O_2 \rightarrow SO_2$

129. $\frac{70}{56} : \frac{30}{16} = 3:2$

130. $N_1V_1 = N_2V_2$

$\frac{N}{8}\times 400 = \frac{N}{12}\times V_2$

$V_2 = 600 ml$

Volume of water to be added $= V_2 - V_1$

$= 600 - 400$

$= 200 ml$

131. Conceptual

132. Conceptual

133. No. of moles $= \frac{W}{M.W}$

134. $r\alpha\frac{1}{\sqrt{M}}$

135. K.E $=\frac{3}{2}nRT$

N = 1 mole, R = 2Cal

K.E = 3T

136. As temperature increases fraction of molecules possessing C_P decreases

137. $P_{SO_2}=X_{SO_2}.P$

138. Conceptual

139. Conceptual

140. $d=\frac{PM}{RT}$

141. For $A \rightleftharpoons B$

$K=\frac{[B]}{[A]}$

$mA \rightleftharpoons mB$

$K^{'}=\frac{[B]^m}{[A]^m}$

$K^{'}=(K)^m$

142. $n=\frac{W}{m.W}$

$n=\frac{64}{128}$

Active mass $=\frac{no.\ of\ moles}{volume\ in\ lt}$

143. $K_1=\frac{K_f}{K_b}, K_2=\frac{1}{K_1}$

144. Conceptual

145. Conceptual

146. Conceptual

147. $\underset{Initial:1}{PCl_5} \rightleftharpoons \underset{0}{PCl_3}+\underset{0}{Cl_2}$

At equation: 1-0.5 0.5 0.5

$K_C=\frac{0.5\times0.5}{0.5}$

$K_C=0.5$

148. $K_P=K_C(RT)^{\Delta n}$

149. $PCl_5 \rightleftharpoons PCl_3+Cl_2$

$PCl_5 \rightleftharpoons PCl_3+Cl_2$

At Eq $Initial:1 \quad 0 \quad 0$

$1-\alpha \quad \alpha \quad \alpha$

Total moles $=1-\alpha+\alpha+\alpha$

$=1+\alpha$

Partial pressure $=\frac{1-\alpha}{1+\alpha}P=\frac{\alpha}{1+\alpha}P=\frac{\alpha}{1+\alpha}P$

150. $K_2 = \frac{1}{\sqrt{K_1}}$

151. Conceptual

152. Conceptual

153. $P^H = 10 \Rightarrow \left[H^+\right] = 10^{-10} mol/lt$

No. of k^+ ions $10ml = \frac{10}{1000} \times 10^{-10} \times 6.02 \times 10^{23}$

$= 6.02 \times 10^{11}$

154. $P^H = P^{Ka} + \log \frac{[salt]}{[acid]}$

$5.8 = 4.8 + \log \frac{[salt]}{[acid]}$

$1 = \log \frac{[salt]}{[acid]}$

$\log 10 = \log \frac{[salt]}{[acid]}$

$[salt]:[acid] = 10:1$

155. $\left[OH^-\right] = C\alpha$

$= C \times \frac{\%}{100}$

$= 0.01 \times \frac{5}{100} = 0.005$

156. $AgCl \rightleftharpoons \underset{(s)}{Ag^+} + \underset{(S)}{Cl^-} \left[Cl\ of\ S = 0.1\right]$

$K_{SP} = S^2$

157. Conceptual

158. $K_h = \frac{K_W}{K_b}$

159. $P^H = 12,\ P^{OH} = 2$

$\left[OH^-\right] = 10^{-2}$

$N = \frac{W}{GMW} \times \frac{1000}{V}$

$10^{-2} = \frac{W}{40} \times \frac{1000}{1000}$

$W = 0.4$

160. Conceptual