SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

SR EAMCET | **DPP-24** | **Date:08-05-2020**

Time: 3 Hours | **Max. Marks:80**

MATHS - A

Syllabus : Combinations

1. **If** ${}^{n}C_{r} = 126$**, then 'r' is**

1)9 2) 7 3) 4 4) 6

2. **If** ${}^{(n-1)}C_{3} + {}^{(n-1)}C_{4} > {}^{n}C_{3}$ **then the minimum value of 'n' is**

1) 5 2) 6 3) 7 4) 8

3. **If a polygon of 'n' sides has 275 diagonals, then n =**

1) 25 2) 35 3) 20 4) 15

4. **The number of ways of selecting two squares on chess board such that they have a common side is**

1) 224 2) 112 3) 56 4) 68

5. **There are 10 true-false questions. The number of ways in which they can be answered is**

1) 10! 2) 2^{10} 3) 10 4) 10^{2}

6. **If** ${}^{n}P_{r} = 840$, ${}^{n}C_{r} = 35$ then $(n,r) =$

1) $(7,4)$ 2) $(6,2)$ 3) $(5,3)$ 4) $(1,2)$

7. **Out of 10 boys and 5 girls a committee of 7 is to be selected. The number of ways in which this can be done when there is a majority of boys is**

1) 4572 2) 4570 3) 5680 4) 5790

8. **A box contains 2 white, 3 black and 4 red balls (balls are different sizes). In how many ways can 3 balls be drawn from the box if atleast one black ball is to be included in the draw?**

1) 84 2) 64 3) 60 4) 120

9. **There are 10 straight lines in a plane no two of which are parallel and no three are concurrent. The points of intersection are joined, then the number of fresh lines formed are**

1) 630 2) 615 3) 730 4) 600

10. **In the intermediate examination, a candidate has to pass in each of the 6 subjects the number of ways that he can fail is**

1) 60 2) 61 3) 62 4) 63

11. **'n' bit strings are made by filling the digits 0 or 1. The number of strings in which there are exactly 'K' zeroes withno 2 'O's consecutive is**

1) ${}^{(n-k)}C_{k}$ 2) ${}^{(n-k+1)}C_{k}$ 3) ${}^{(n-k-1)}C_{k}$ 4) ${}^{(n+k)}C_{k}$

12. **A father with 6 children takes 3 at a time to a park without taking the same children. How often each child goes to the park?**

1) 10 2) 12 3) 15 4) 20

13. **In how many ways can 3 sovereigns can be given away when there are 4 applicants and any applicant may have either 0,1,2 or 3 sovereigns**

1) 15 2) 20 3) 24 4) 48

14. **If one quarter of all 3 elements subsets of set** $A = \{a_1, a_2, a_3 ..... a_n\}$ **is equal to the number of subsets containing the element** a_3 **then n =**

1) 10 2) 12 3) 14 4) 16

15. **If a and b are the greatest values of** ${}^{2n}C_{r}$ and ${}^{2n-1}C_{r}$ respectively then

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

16. **Consider 3 boxes, each containing 10 balls labelled 1,2,…..10. Suppose 1 ball is randomly drawn from each of the boxes. Denote by** n_i**, the label of the ball drawn from the** i^{th} **box,** $(i = 1,2,3)$**. Then the number of ways in which the balls can be chosen such that** $n_1 < n_2 < n_3$ **is**

1) 120 2) 164 3) 240 4) 82

17. **If** $\sum_{j=1}^{20}\left(\frac{{}^{20}C_{i-1}}{{}^{20}C_i+{}^{20}C_{i-1}}\right)^3=\frac{k}{21}$ **then k =**

1) 50 2) 400 3) 200 4) 100

18. **In order to get through in an exam of a papers, a candidate has to pass in more papers than the number of papers in which he fails. The number of ways in which he can fail, in this exam is**

1) 255 2) 256 3) $9\times(8!)$ 4) 128

19. **If** $\sum_{r=0}^{25}\{{}^{50}C_r.{}^{50-r}C_{25-r}\}=K\left({}^{50}C_{25}\right)$

1) 2^{25} 2) $2^{25}-1$ 3) $(25)^2$ 4) 2^{24}

20. **Let A and B be 2 sets containing 2 elements and 4 elements. The number of subsets of** $A\times B$ **having 3 or more elements is**

1) 220 2) 219 3) 211 4) 256

MATHS - B

Syllabus: Hyperbola (Remaining part)

21. **The locus of middle points of chords of the hyperbola** $3x^2-2y^2+4x-6y=0$ **parallel to**

$\text{Tan}\,\theta==\frac{2\sqrt{h^2-ab}}{a+b}$

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

22. **The asymptotes of a hyperbola** $7x+5y-12=0,\ 2x+3y-5=0$**. Its centre is**

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

23. **The product of the distances from any point on the hyperbola** $\frac{x^2}{16}-\frac{y^2}{9}=1$ **to its asymptotes is**

1) $\frac{123}{25}$ 2) $\frac{25}{124}$ 3) $\frac{25}{14}$ 4) $\frac{144}{25}$

24. **If** θ **is the angle between the asymptotes of the hyperbola** $x^2+2xy-3y^2+x+7y+9=0$ **then** $\tan\theta=$ _____

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

25. **The eccentricity of the conic represented by** $2x^2+5xy+2y^2+11x-7y-4=0$ **is**

1) $\frac{\sqrt{10}}{3}$ 2) $\frac{\sqrt{10}}{4}$ 3) $\frac{5}{4}$ 4) $\frac{3}{5}$

26. **The equation of the conjugate hyperbola of** $xy+3x-4y+13=0$

1) $(x-4)(y+3)=0$ 2) $xy+3x-4y-13=0$

3) $(x-4)(y+3)=0$ 4) $(x-4)(y+3)=0$

27. **If the line** $lx+my=1$ **is a normal to the hyperbola** $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ **then** $\frac{a^2}{l^2}+\frac{b^2}{m^2}=$ _____

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

28. **The asymptotes of the hyperbola are** $3x=\pm5y$ **and its vertices are** $(\pm5,0)$ **then the length of latus rectum of the hyperbola is** _____

1) $\frac{9}{5}$ 2) $\frac{18}{5}$ 3) $\frac{50}{3}$ 4) $\frac{25}{3}$

29. The equation of the asymptotes of hyperbola $2xy+7x-6y-18=0$ is

1) $2xy+7x-6y-19=0$ 2) $2xy+7x-6y+22=0$

3) $xy+7x-6y+23=0$ 4) $2xy+7x-6y-21=0$

30. Locus of p such that the chord of contact of p with respect to $y^2=4ax$ touches the hyperbola $x^2-y^2=a^2$

1) $x^2+4y^2=4a^2$ 2) $4x^2+y^2=4a^2$ 3) $x^2+2y^2=2a^2$ 4) $2x^2+y^2=2a^2$

31. The foot of the perpendicular from the focus to an asymptote of the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$

1) (ae,be) 2) $\left(\frac{a}{e},\frac{b}{e}\right)$ 3) $\left(\frac{e}{a},\frac{e}{b}\right)$ 4) (a,b)

32. The focus and direction of a rectangular hyperbola are $(1,-1)$ and $x-y+1=0$ then equation of asymptotes is

1) $xy-2x+2y-4=0$ 2) $xy-2x+2y+5=0$

3) $xy-2x+2y+7=0$ 4) $xy-2x+2y-6=0$

33. Area of the triangle formed by any tangent to the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ with its asymptotes is

1) ab 2)abc 3) 4ab 4) a^2b^2

34. The locus of the centre of circle touches two circles externally is

1) Radical axis 2) Parabola 3) Ellipse 4) Hyperbola

35. If the eccentricity of the hyperbola $x^2-y^2\sec^2\alpha=5$ is $\sqrt{3}$ times the eccentricity of the ellipse $x^2\sec^2\alpha+y^2=25$ then a value of α is

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

36. The separate equations of the asymptotes of rectangular hyperbola $x^2+2xy\cot 2\alpha-y^2=a^2$ are

1) $x\cot\alpha-y=0, x\tan\alpha+y=0$ 2) $x\cot\alpha+y=0, x\tan\alpha+y=0$

3) $x\cot\alpha+y=0, x\tan\alpha-y=0$ 4) $x\cot\alpha-y=0, x\tan\alpha-y=0$

37. Equation of the hyperbola with vertices $(\pm5,0)$ and pair of asymptotes $\frac{x^2}{25}-\frac{y^2}{9}=0$ is

1) $9x^2-25y^2=225$ 2) $9x^2-25y^2=25$ 3) $9x^2-25y^2=16$ 4) $9x^2-25y^2=34$

38. Consider the set of hyperbola $xy=k,\ k\in R$. Let $k\in R$. Let e_1 be the eccentricity wen $k=4$ and e_2 be the eccentricity when $k=9$ then $e_1-e_2=$ ____

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

39. If the foci of the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ and the hyperbola $\frac{x^2}{4}-\frac{y^2}{b^2}=1$ coincide, then $b^2=$ ___

1) 4 2) 5 3) 8 4) 9

40. If e and e^1 are the eccentricities of the ellipse $5x^2+9y^2=45$ and the hyperbola $5x^2-4y^2=45$ respectively then $ee^1=$ ___

1) 9 2) 5 3) 4 4) 1

PHYSICS

Syllabus: Electromagnetic induction.

41. When ever the flux linked with a coil changes, then

1) Current is always induced
2) An emf and a current are always induced
3) An emf is induced but a current is never induced

4) An emf is always induced and a current is induced, when the coil is a closed one

42. An inductance stores energy in the

1) Electric field 2) Magnetic field
3) Resistance of the coil 4) Electric and magnetic fields

43. A square loop of side 22cm is changed to a circle in time 0.4 sec with its plane normal to a magnetic field 0.2 T. The emf induced is

1) $+6.6mv$ 2) $-6.6mv$ 3) $+13.2mv$ 4) $-13.2mv$

44. A closed coil with a resistance R is placed in a magnetic field. The flux linked with the coil is ϕ. If the magnetic field is suddenly reversed in directions the charge that flows through the coil will be

1) $\frac{\phi}{2R}$ 2) $\frac{\phi}{R}$ 3) $\frac{2\phi}{R}$ 4) $Zero$

45. A metal bar of length 1m falls from rest under the action of gravity remaining horizontal with its ends in east-west direction. The induced emf in it at the instant when it has fallen for 10 sec is $\left(B_H = 1.7\times10^{-5}T \text{ and } g = 10m/s^2\right)$

1) $2.5mv$ 2) $3.2mv$ 3) $1.7mv$ 4) $0.5mv$

46. A copper disc of diameter 20cm makes 1200 r.p.m about its natural axis kept parallel to a uniform magnetic field of $10^{-2}T$. The potential difference between the centre and edge of the disc is

1) $6.28\times10^{-3}v$ 2) $62.8\times10^{-3}v$ 3) $0.628\times10^{-3}v$ 4) $0.628v$

47. In an ac generator a coil with 'N' turns, all of the same area 'A' and total resistance 'R' rotates with frequency 'w' in a magnetic field B. The maximum value of emf generated in the coil is

1) NABRW 2) NAB 3) NABR 4) NABW

48. A coil has self inductance of 0.01 H. The current through it is allowed to change at the rate of 1A in 10^{-2} sec. The induced emf is

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

49. The average self-induced emf in a 25mH solenoid when the current in it falls from 0.2A to 0A in 0.01 seconds is

1) 0.05 v 2) 0.5 v 3) 500 v 4) 50 v

50. Two inductors each of inductance 'L' are joined in parallel. Their equivalent inductance is

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

51. Two inductance coils made of different metal wires are having the same inductance. But their time constants are in the ratio 1:2. Then the ratio of their resistance is

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

52. The time constant of an inductor is 'τ_1'. When a pure resistor of 'R' Ω is connected in series with it, the time constant is found to decrease to 'τ_2'. The internal resistance of the inductor is

1) $\frac{R\tau_2}{\tau_1-\tau_2}$ 2) $\frac{R\tau_1}{\tau_1-\tau_2}$ 3) $\frac{R(\tau_1-\tau_2)}{\tau_1}$ 4) $\frac{R(\tau_1-\tau_2)}{\tau_2}$

53. In a coil of area $10cm^2$ and 10 turns with magnetic field directed perpendicular to the plane and is changing at the rate of 10^8 gauss/second. The resistance of the coil is 20Ω. The current in the coil will be

1) 0.5 A 2) 5 A 3) 50 A 4) $5\times10^8 A$

54. A coil having an area $2m^2$ is placed in a magnetic field which changes from $1wb/m^2$ to $4wb/m^2$ in an interval of 2 second. The average emf induced in the coil will be

1) 4 v 2) 3 v 3) 1.5 v 4) 2 v

55. A coil has an inductance of 0.05 H and 100 turns and 0.02A current is passed through it. Flux linked with coil is

1) $10^{-2}\,wb$ 2) $10^{-3}\,wb$ 3) $10^{-4}\,wb$ 4) $10^{-5}\,wb$

56. A current of 2A is increasing at the rate of $4A/\sec$ through a coil of inductance 2H. The energy stored in the inductor per unit is

1) 2 w 2) 1 w 3) 16 w 4) 4 w

57. The current decays from 5A to 2A in 0.01 sec in a coil. The emf induced in a coil near by it is 30 v. The mutual inductance between the coils is

1) 1.0 H 2) 0.1 H 3) 0.001 H 4) 10 H

58. A solenoid of length 50cm with 20 turns per centimeter and area of cross section 40 cm^2 completely surrounds another coaxial solenoid of the same length, area of cross-section $25cm^2$ with 25 turns per cm. Calculate the mutual inductance of the system

1) 9.7 mH 2) 7.9 mH 3) 8.9 mH 4) 6.8 mH

59. The current in a coil is changed from 5A to 10A in $10^{-2}\sec$. An emf of 50 mv is induced in coil near by it. The mutual inductance of two coil is

1) $100\mu H$ 2) $200\mu H$ 3) $300\mu H$ 4) $400\mu H$

60. The law of electromagnetic induction have been used in the construction of a

1) Galvanometer 2) Voltmeter 3) Electric motor 4) Electric generator

CHEMISTRY

Syllabus : Co-ordination compounds

61. Nitrobenzene undergoes reduction with Zn/alcoholic KOH to form a compound A. The number of Sigma and Pi bonds in A, respectively are

1) 17, 6 2) 27, 6 3) 27, 8 4) 17, 8

62. Nitrobenzene is reduced by Zn and alcoholic potash mixture to get

1) $C_6H_5-NH_2$ 2) $C_6H_5-NH-NH-C_6H_5$

3) $C_6H_5-N-N-C_6H_5$ 4) $C_6H_5-NH-CO-C_6H_5$

63. Which of the following reactions can produce aniline as the main product?

1) $C_6H_5NO_2+Zn/KOH$ 2) C_6H_5NHOH

3) $C_6H_5NO_2+LiAlH_4$ 4) $C_6H_5NO_2+Zn/HCl$

64. Which of the following compounds is soluble in benzene but almost insoluble in water?

1) C_6H_5OH 2) CH_3CO_2H 3) CH_3CHO 4) $C_6H_5NO_2$

65. Aniline is not the major product in one of the following reactions. Identify the reaction

1) $C_6H_5OH+NH_3 \xrightarrow[300^0C]{ZnCl_2}$

2) $C_6H_5NO_2+Zn$ powder $\xrightarrow{alcoholic\ \mathrm{KOH}}$

3) $C_6H_5Cl+NH_3 \xrightarrow[CH_2O]{200^0C}$ High pressure

4) $C_6H_5NO_2+Fe+H_2O \xrightarrow{HCl} CHO$

66. Which of the following is the molecular formula of a tertiary amine?

1) C_6H_7N 2) C_3H_9N 3) CH_5N 4) CH_3N

67. Which is the product obtained when nitrobenzene is reacted with HCl in the presence of Sn

1) $C_6H_5N=NC_6H_5$ 2) $C_6H_5NH_2$ 3) $C_6H_5NH-NHC_6H_5$ 4) C_6H_5NHOH

68. How many tripeptides can be prepared by linking the amino acids glycine, alanine and phenyl

1) One 2) Three 3) Six 4) Twelve

69. A codon has a sequence of A, and specifies a particular B that is to be incorporated into a C. What are A, B, C?

A	B	C
1) 3 bases	amino acids	carbohydrate
2) 3 acids	carbohydrate	protein
3) 3 bases	protein	amino acid
4) 3 bases	amino acid	protein

70. Which one of the statements is not true for glucose?

1) $\alpha - D(+)$ glucose undergoes mutarotation

2) It has four asymmetric carbons in Fischer projection formula

3) It gives saccharic acid with Tollen's reagent

4) It reacts with hydroxyl amine

71. Hydrolysis of sucrose with dilute aqueous sulfuric acid yields

1) 1:1 D(+) – glucose; D – (–) fructose

2) 1: 2 D – (+) glucose; D – (–) fructose

3) 1:1 D – (–) glucose; D – (+) fructose

4) 1: 2 D – (–) glucose; D – (+) – fructose

72. Match the following

List I (Vitamins	**List II**
A. B_1	i. Riboflavin
B. B_2	ii. Pantothenic acid
C. B_3	iii. Niacin
D. B_5	iv. Thiamine

The correct match is

1) A-iv, B-i, C-iii, D-ii 2) A-iv, B-iii, C-i, D-ii

3) A-iii, B-iv, C-ii, D-i 4) A-iv, B-i, C-ii, D-iii

73. Which of the following biomolecules acts as specific catalysts in biological reactions?

1) Carbohydrates 2) Lipids 3) Vitamins 4) Enzymes

74. A mixture of amylase and amylopectin is called

1) Lactose 2) Starch 3) Cellulose 4) Sucrose

75. Which one of the following pairs of complexes has the EAN equal to 36 for the transition element

1) $\left[CO(NH_3)_6\right]Cl_3, K_3\left[Fe(CN)_6\right]$ 2) $\left[CO(NH_3)_6\right]Cl_3, \left[Cr(H_2O)_6\right]Cl_3$

3) $\left[Fe(CO)_5\right], K_4\left[Fe(CN)_6\right]$ 4) $\left[Fe(CO)_5\right], K_3\left[Fe(CN)_6\right]$

76. When $AgNO_3$ solution is added in excess to 1M solution of $COCl_3.XNH_3$ one mole of $AgCl$ is

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

77. How many 'd' electrons are present in Cr^{2+} ion

1) 4 2) 5 3) 6 4) 3

78. Which one of the following is a diamagnetic ion

1) CO^{2+} 2) Cu^{2+} 3) Mn^{2+} 4) Se^{3+}

79. $\left[CO(NH_3)_5 SO_4\right]Br$ and $\left[CO(NH_3)_5 Br\right]SO_4$ are a pair of _____ isomers

1) Ionisation 2)Liganol 3) Coordination 4) Hydrate

80. Brass is an alloy of

1) Ag and Cu 2) Sn and Zn 3) Cu and Sn 4) Cu and Zn

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KEY

MATHS A

1)	3	2)	4	3)	1	4)	1	5)	2	6)	1	7)	4	8)	2	9)	1	10)	4
11)	2	12)	1	13)	2	14)	2	15)	1	16)	1	17)	4	18)	2	19)	1	20)	2

MATHS B

21)	1	22)	1	23)	4	24)	3	25)	1	26)	3	27)	3	28)	2	29)	3	30)	2
31)	4	32)	1	33)	1	34)	4	35)	2	36)	1	37)	1	38)	3	39)	2	40)	4

PHYSICS

41)	4	42)	2	43)	2	44)	3	45)	3	46)	2	47)	4	48)	1	49)	2	50)	3
51)	4	52)	1	53)	2	54)	2	55)	4	56)	3	57)	2	58)	2	59)	1	60)	4

CHEMISTRY

61)	2	62)	2	63)	4	64)	4	65)	2	66)	2	67)	2	68)	3	69)	4	70)	3
71)	1	72)	4	73)	4	74)	2	75)	3	76)	4	77)	1	78)	4	79)	1	80)	4

HINTS AND SOLUTIONS
MATHS A

1. ${}^{9}C_{4} = 126$
2. ${}^{n}C_{r} + {}^{n}C_{r-1} = {}^{(n+1)}C_{r}$

   And $\frac{{}^{n}C_{r}}{{}^{n}C_{r-1}} = \frac{n-r+1}{r}$
3. $\frac{n(n-3)}{2} = 275$
4. $2.{}^{8}c_{3}$ (diagonal of maximum length has 8 squares)
5. True + False = 2

   2.2.2….. 10 times = 2^{10}
6. $r! = \frac{{}^{n}p_{r}}{{}^{n}c_{r}} = \frac{840}{35}$

   $r = 4$
7. Required number of ways = ${}^{10}c_{4} \times {}^{5}c_{3} + {}^{10}c_{5} \times {}^{5}c_{2} + {}^{10}c_{6} \times {}^{5}c_{1} + {}^{10}c_{7}$
8. 2W; 2B; 4R

   Required number of ways = ${}^{6}c_{42} \times {}^{3}c_{1} + {}^{6}c_{1} \times {}^{3}c_{2} + {}^{6}c_{0} \times {}^{3}c_{3}$
9. $\frac{n(n-2)(n-2)(n-3)}{8}$ put $n = 10$
10. $2^{6} - 1$
11. Out of ‘n’bit strings, k are zero’s and $(n-k)$ are 1’s first arrange $(n-k)$ things in 1 way and fill $(n-k+1)$ places with k, zeroes in ${}^{(n-k+1)}C_{k}.1$ ways

12. ${}^{n-s}c_{c-s} = {}^{6-1}c_{3-1} = {}^{5}c_{2} = \frac{5\times 4}{2\times 1} = 10$

13. $x+y+z+w=3$

Number of non-negative integral solutions ${}^{3+4-1}c_{4-1} = 20$

14. $\frac{1}{4}.{}^{n}c_{3} = {}^{n-1}c_{2} \Rightarrow n = 12$

15. ${}^{2n}c_{n} = a,\ {}^{2n-1}c_{n} = b$

16. ${}^{10}c_{3}$ is no. of ways of selecting 2 numbers from 1 to10. Let us consider one such case : (2, 5, 6) then 2 would be picked from B_1, 5 from B_2 and 6 from B_3 hence ${}^{10}c_{3} = 120$

17. $\sum_{i=1}^{20}\left(\frac{{}^{20}c_{i-1}}{{}^{20}c_{i}+{}^{20}c_{i-1}}\right)^{3}$

Now $\frac{{}^{20}c_{i-1}}{{}^{20}c_{i}+{}^{20}c_{i-1}} = \frac{{}^{20}c_{i-1}}{{}^{21}c_{i}} = \frac{i}{21}$

Let given sum be s, so

$s = \sum_{i=1}^{20}\frac{(i)^3}{(21)^3} = \frac{1}{(21)^3}\left(\frac{20.21}{2}\right)^2 = \frac{100}{21}$

$k = 100$

18. Number of ways in which he can fail

$= {}^{9}c_{5} + {}^{9}c_{6} + {}^{9}c_{7} + {}^{9}c_{8} + {}^{9}c_{9}$

$= 126+84+36+9+1 = 256$

19. $\sum_{r=0}^{20} {}^{50}c_{r}.{}^{50-r}c_{25-r}$

$\sum_{r=0}^{20}\frac{50!}{r!(50-r)!}.\frac{(50-r)!}{(25)!25!}$

$\sum_{r=0}^{20}\frac{50!25!}{r!(50-r)!(25)!25!}$

${}^{50}c_{25}\sum_{r=0}^{25}{}^{25}c_{r} = {}^{50}c_{25}\times 2^{25} = k\left({}^{50}c_{25}\right)$

$k = 2^{25}$

20. $A\times B$ will have 8 elements

$2^8 - {}^{8}c_{0} - {}^{8}c_{1} - {}^{8}c_{2} = 256-1-8-28 = 219$

MATHS B

21. $S_1 = S_{11}$ and equating the slopes

22. Point of intersection of asymptotes its centre

23. Use $\frac{a^2b^2}{a^2+b^2}$

24. $K_4\left[Fe(CN)_6\right]EAN = 26-2+12 = 36$

25. Use $\theta = \mathrm{Tan}^{-1}\frac{2\sqrt{h^2-ab}}{a+b}$

26. Given hyperbola is $(x-4)(y+3) = -25$ its conjugate is $(x-4)(y+3) = 25$

27. $y = mx+\frac{1}{m},\ \frac{1}{m^2} = a^2m^2 - b^2$

28. Assymptotes are $\frac{x}{5}=+\frac{y}{3}$

Equation of hyperbola $\frac{x^2}{25}-\frac{y^2}{9}=1$

29. Equation of asymptotes is $2xy+7x-6y+5=0$ then $\square=0$

30. Chord of contact of $y^2=4ax$ is $s_1=0$ it touches $x^2-y^2=a^2$, use $a^2l^2-b^2m^2=n^2$

31. $S=(ae,0)$, one asymptote is $bx-ay=0$ then foot of the perpendicular from s to $bx-ay=0$ is $\left(\frac{a}{0},\frac{b}{e}\right)$

32. $sp^2=e^2pm^2\Rightarrow xy-2x+2y+\frac{1}{2}=0$

Equations of asymptotes are $xy-2x+2y+k=0$, $\square=0,k=-4$

33. $\frac{x}{a}\sec\theta=\frac{y}{b}\tan\theta=1,\ \frac{x}{a}-\frac{y}{b}=0,\ \frac{x}{a}+\frac{y}{b}=0,$

$\left(\frac{a}{\sec\theta-\tan\theta},\frac{b}{\sec\theta-\tan\theta}\right),\quad \left(\frac{a}{\sec\theta+\tan\theta},\frac{-b}{\sec\theta+\tan\theta}\right)$

34. $cp=r_1+r,\quad CQ=r_2+r$ where $C=(h,k)\ P=(a,b)$

$Q=(c,d),\ CQ-CP=r_2-r_1=\text{constant}$

35. $e_1^{\ 2}=1+\frac{b^2}{a^2}=1+\frac{5\cos^2\alpha}{5}=1+\cos^2\alpha$

$e_2^{\ 2}=1-\frac{25\cos^2\alpha}{25}=1-\cos^2\alpha=\sin^2\alpha$

$e_1=\sqrt{3}e_2\Rightarrow\sin\alpha=\frac{1}{\sqrt{2}}$

36. Equation of the asymptotes may be taken as $x^2+2xy\cot2\alpha-y^2+k=0$. $\Delta=0\Rightarrow k=0$

$x^2+2xy\cot2\alpha-y^2=(x\cot\alpha-y)(x\tan\alpha+y)$

37. $\frac{x^2}{25}-\frac{y^2}{9}=k$ passes through $(\pm5,0)\Rightarrow k=1$

38. $y=mx\pm\sqrt{a^2m^2-b^2}$

$m(x^2-a^2)-2mxy+(y^2+b^2)=0$

(c,d) lies, $\tan\alpha\ \tan\beta=1\Rightarrow m_1m_2=1$

$c^2-d^2=a^2+b^2$

39. $e=\frac{3}{5},ae=3$

$2\sqrt{\frac{4+b^2}{4}}=3$

$\sqrt{4+b^2}=3$

S.O.B

$4+b^2=9$

$b^2=5$

40. $\frac{x^2}{9}+\frac{y^2}{5}=1$

$$e=\frac{\sqrt{a^2-b^2}}{9}=\frac{2}{3}$$

$$\frac{x^2}{9}-\frac{y^2}{\frac{45}{4}}=1\Rightarrow e^1=\frac{\sqrt{a^2+b^2}}{9}=\frac{3}{2}$$

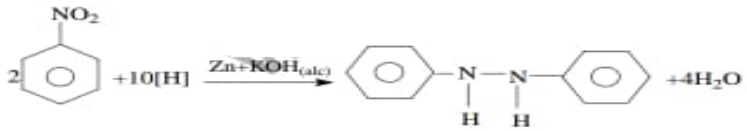
PHYSICS

41. C.U.Q
42. C.U.Q
43. $e=-B\frac{dA}{dt}=-B=\frac{A_2-A_1}{t_2-t_1}$
44. $g=\frac{d\phi}{R}=\frac{\phi_2-\phi_1}{R}=\frac{\phi-(\phi)}{R}=\frac{2\phi}{R}$
45. $e=B_H lv$ where $v=gt$
46. $e=\frac{1}{2}BR^2w$ where $w=2\pi f$
47. $e=NABW\ \text{coswt}\Rightarrow e_{max}=NABW$
48. $e=L\frac{di}{dt}$
49. $e=L\frac{di}{dt}$
50. $L_p=\frac{L_1L_2}{L_1+L_2}$
51. $\frac{t_1}{t_2}=\frac{R_2}{R_1}$
52. $T_1=\frac{L}{R};T_2=\frac{L}{R+r}$

    Solve for 'r' from the above equation
53. $i=\frac{1}{R}NA.\frac{dB}{dt}=\frac{1}{20}\times10\times10^{-3}\times10^4=5A$
54. $e=A\frac{dB}{dt}$
55. $n\phi=Li$
56. $\square=\frac{1}{2}Li^2;P=\frac{dU}{dt}\Rightarrow P=Li\frac{di}{dt}$
57. $e=-M\left(\frac{di}{dt}\right)$
58. $M=\frac{\mu_0N_1N_2A_2}{l}$ v
59. $e=M\frac{di}{dt}$
60. C.U.Q

CHEMISTRY

61.

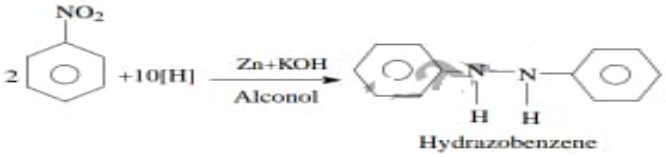


62. $2C_6H_5NO_2 + 10(H) \xrightarrow{Zn+KOH(alc)} C_6H_5 - NH - NH - C_6H_5$

63. $C_6H_5NO_2 + 6(H) \xrightarrow{Zn/HCl} C_6H_5NO_2 + 2H_2O$

64. Nitrobenzene is soluble in organic solvents like Benzene but insoluble in water

65.



Hydrazobenzene

66. In tertiary amine, nitrogen atom is attached to three alkyl groups. The only formula that fits into this is C_3H_9N or $(CH_3)_3N$

67. When reduced in strongly acid medium $(Sn + HCl)$ nitrobenzene gives aniline.

$C_6H_5NO_3 + 6[H] \rightarrow C_6H_5NH_2 + 2H_2O$

68. Ala – gly – Ala Ala – Phe – Ala Gly – Phe – Gly
Gly – Ala – Gly Phe – Ala – Phe Phe – gly – phe

69. $\frac{3bases}{A}$ specifies a particular $\frac{\text{amino acid}}{B}$ that is to be incorporated into $\frac{\text{protein}}{C}$

70. Tollen's reagent is a oxidizing agent. It gives gluconic acid with glucose

71. $C_{12}H_{22}O_{11} + H_2O \xrightarrow{dil.H_2SO_4}$

Sucrose

$C_6H_{12}O_6 + C_6H_{12}O_6$

$D(+)$glucose D$(-)$ *fructose*

72. B_1 - Thiamin

B_2 - Riboflavin

B_3 - Pentothenic acid

B_5 - Niacin

73. Enzymes are specific catalysis in biological reactions

74. Starch is a mixture of amylase and amylopectin

75. $[Fe(CO)_5]\ EAN = 26 + 10 = 36$

$K_4[Fe(CN)_6]\ EAN = 26 - 2 + 12 = 36$

76. $COCl_3.XNH_3$ give 1 mole of AgCl. So one Cl^- ion is outside the complex.

So $2Cl^-$ and $4NH_3$ satisfy co-ordinates number = 6

77. $Cr^{+2} = [Ar]4s^0 3d^4$

Number of electrons are 4

78. The ion with no unpaired electrons acts as diamagnetic ion Se^{+3} ion as no unpaired electrons

$Se^{+3} = [Ar]3d^0 4s^0$

79. $[CO(NH_3)_5 SO_4]Br$ gives Br^- ion in aqueous solution

$[CO(NH_3)_5 Br]\ SO_4$ gives SO_4^{-2} ion in aqueous solution

80. Brass : $Cu \rightarrow 60 - 80\%$

$Zn \rightarrow 20 - 40\%$