Brilliant STUDY CENTRE

PALA

REPEATERS NEET/JEE 2026
SCREENING CUM SCHOLARSHIP TEST

31-05-2025

PHYSICS + CHEMISTRY + BIOLOGY + MATHEMATICS

Name of the Candidate :	
Signature of Candidate :	
Phone Number / Mobile No. :	
Student ID:	
Roll Number	

INSTRUCTIONS

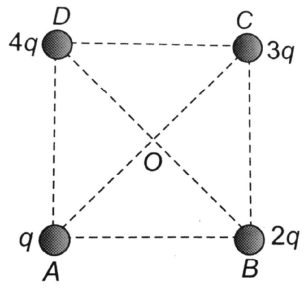
1. OMR Answer scripts are processed by electronic means. The following instructions are to be strictly followed to avoid invalidation of answer scripts
2. If the OMR sheet given is found defective, get it replaced by a new one
3. Please fill in the items such as name, user id, signature, centre etc. of the candidate in the columns given above.
4. Question Booklet Code is printed on the top left corner of this page. Enter it correctly in the OMR sheet
5. Write the student ID in digits besides darkening the bubbles for the "Student ID"
6. Make sure that the "Student ID" is bubbled correctly and completely; no correction is permitted. If any error occurred while filling "Student ID" get a new OMR answer sheet
7. Do not write or make any mark on the Answer Sheet except at the spaces specially-provided for.
8. Each correct answer will be awarded **FOUR** marks. ONE mark will be deducted for each incorrect answer. More than one answer marked against a question will be deemed as an incorrect response and will be negatively marked. No negative mark for unattended questions.
9. All the rough work is to be done in the blank space provided in the question paper.
10. **WARNING:** Any malpractice or any attempt of malpractice, in the Examination, will **DISQUALIFY THE CANDIDATE.**
11. **Return the Answer sheet to the invigilator at the end of the examination.**
12. The scanner will read only the correct method of marking shown below. Other methods of marking will consider as wrong
13. Question paper booklet consists of four parts. Part I-Physics (30 qns.), Part II-Chemistry (30 qns.), Part III-Biology (30 qns.) and Part IV - Mathematics (30 qns.).
14. Those who seek admission to the **NEET** batches have to write the test based on physics, chemistry and biology topics. The test will be of **1½** hrs duration.
15. Those who seek admission to the **JEE** batches have to write the test based on physics, chemistry and mathematics topics. The test will be of **1½** hrs duration.
16. Those who seek admission to the **either NEET / JEE** batches have to write the test based on physics, chemistry, biology and mathematics topics. The test will be of **2.00** hrs duration. Their names will be included in the ranklists of NEET and JEE batches based on their respective marks.

Correct Method of Marking	Wrong Methods of Marking							
	Tick Mark	X Mark	Dot Mark	Scratch Mark	Partial Mark	Line Mark	Outside Mark	Multiple Mark
●○○○	○	○	⊙	▨	◑	⊖	◐	●●

IMMEDIATELY AFTER OPENING THIS QUESTION BOOKLET, THE CANDIDATE SHOULD VERIFY WHETHER THE QUESTION BOOKLET ISSUED CONTAINS ALL THE 120 QUESTIONS IN SERIAL ORDER. IF NOT, REQUEST FOR REPLACEMENT

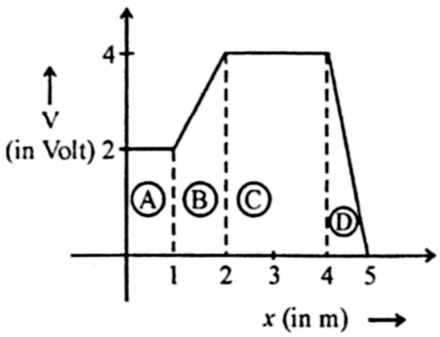
PART I - (PHYSICS)

1. Charges q, 2q, 3q and 4q are placed at the corners A, B, C and D of a square as shown in the following figure. The direction of electric field at the centre of the square is along



1) AB
2) CB
3) BD
4) AC

2. The figure gives the electric potential V as a function of distance through four regions on x-axis. Which of the following is true for the magnitude of the electric field E in these regions?



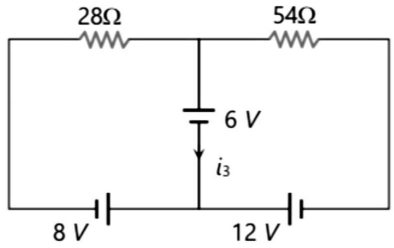
1) $E_A > E_B > E_C > E_D$
2) $E_A = E_C$ and $E_B < E_D$
3) $E_B = E_D$ and $E_A < E_C$
4) $E_A < E_B < E_C < E_D$

SPACE FOR ROUGH WORK

3. An electric dipole is placed at an angle of 30^0 with an electric field of intensity 2×10^5 NC^{-1}. It experiences a torque equal to 4 Nm. Calculate the charge on the dipole if the dipole length is 2cm.

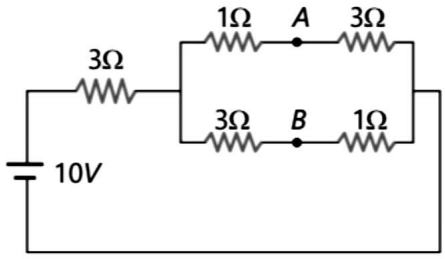
1) 8 mC
2) 4 mC
3) 8μC
4) 2 mC

4. Consider the circuit shown in the figure. The current i_3 is equal to



1) 5 A
2) -5/6 A
3) –3 A
4) 5/6 A

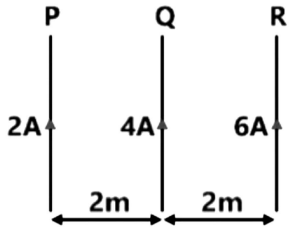
5. A battery of emf 10 V is connected to resistance as shown in figure. The potential difference $V_A - V_B$ between the points A and B is



1) –2 V
2) 2V
3) 5V
4) $\frac{20}{11}$V

SPACE FOR ROUGH WORK

6. Three long straight wires, carrying currents are arranged according to figure. Magnetic force on 10 cm part of the wire Q is:-



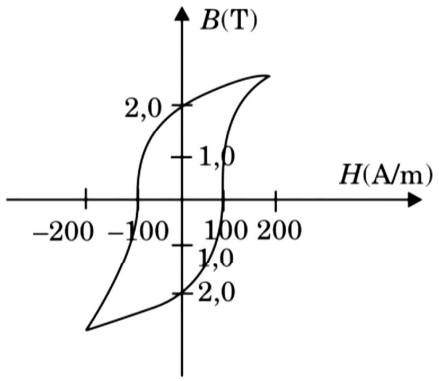
1)16×10^{-9}N , towards right

2) 16×10^{-8}N, towards right

3) 16×10^{-8}N, towards left

4) 16×10^{-9}N, towards left

7. The B-H curve for a ferromagnet is shown in the figure. The ferromagnet is placed inside a long solenoid with 1000 turns/cm. The current that should be passed in the solenoid to demagnetise the ferromagnet completely is:



1) 2 mA

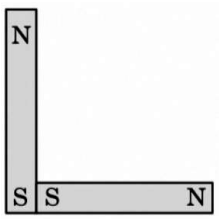
2) 20μA

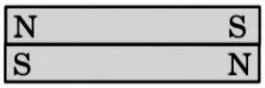
3) 1 mA

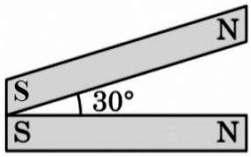
4) 40μA

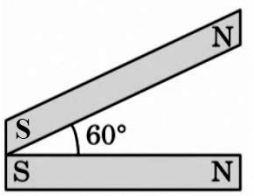
SPACE FOR ROUGH WORK

8. The following figures show the arrangement of bar magnets in different configurations. Each magnet has magnetic dipole moment M. Which configuration has highest net magnetic dipole moment?

1) 

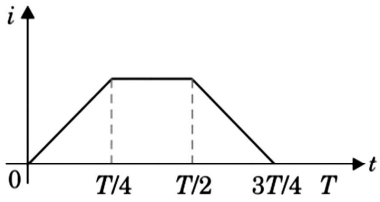
2) 

3) 

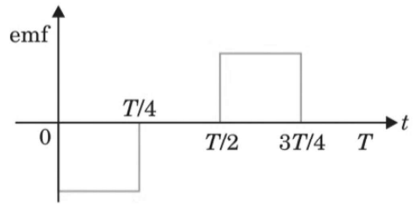
4) 

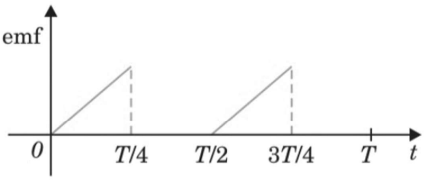
SPACE FOR ROUGH WORK

9. The current in a coil varies with time as shown in the figure

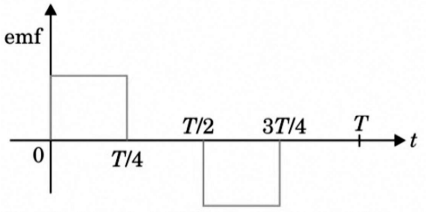


The variation of induced emf with time would be:

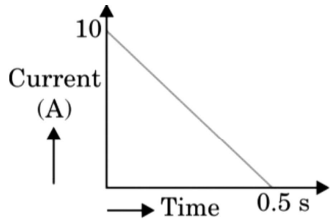
1) 

2) 

3) 

4) 

10. In a coil of resistance 100Ω , a current is induced by changing the magnetic flux through it as shown in the figure. The magnitude of change in flux through the coil is



1) 200 Wb 2) 225 Wb 3) 250 Wb 4) 275 Wb

SPACE FOR ROUGH WORK

11. The questions given below consist of an assertion and a reason. Use the following key to choose appropriate answer:

1) If both assertion and reason are correct and reason is a correct explanation of the assertion

2) If both assertion and reason are correct but reason is not the correct explanation of assertion

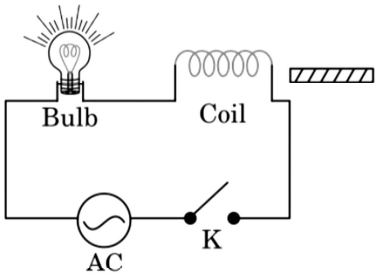
3) If assertion is correct but reason is incorrect

4) If assertion is incorrect but reason is correct

Assertion : AC circuit derives maximum power when it is in a state of resonance

Reason : Power factor of the circuit becomes zero in case of resonance

12. In the AC circuit shown, keeping 'K' pressed, if an iron rod is inserted into the coil, the bulb in the circuit



1) glows more brightly.

2) gets damaged.

3) glows with same brightness (as before the rod is inserted)

4) glows less brightly

SPACE FOR ROUGH WORK

13. A coil of self-inductance L is connected in series with a bulb B and an AC source. Brightness of the bulb decreases when

1) number of turns in the coil is reduced.

2) a capacitance of reactance $X_C = X_L$ is included in the same circuit.

3) an iron rod is inserted in the coil

4) frequency of the AC source is decreased.

14. A convex mirror of focal length f forms an image which is $\frac{1}{n}$ times the object. The distance of the object from the mirror is

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

15. A concave mirror of focal length 'f_1' is placed at a distance of 'd' from a convex lens of focal length 'f_2'. A beam of light coming from infinity and falling on this convex lens – concave mirror combination returns to infinity. The distance 'd' must equal:

1) $-2f_1 + f_2$ 2) $f_1 + f_2$ 3) $-f_1+f_2$ 4) $2f_1 + f_2$

16. Each question has matching list. The codes for the lists have choices (a), (b), (c) and (d); out of which only one is correct.

	List - I		**List II**
P.	law of Malus	1.	$i_p = \tan^{-1}(\mu)$
Q.	Brewster's law	2.	$I = \frac{I_0}{2}\cos^2\theta$
R.	Snell's Law	3.	$\sin^{-1}(1/\mu)$
S.	Critical angle	4.	$\mu \sin\theta = \text{constant}$

1) P-2; Q-1; R-4; S-3 2) P-1; Q-3; R-2; S-4

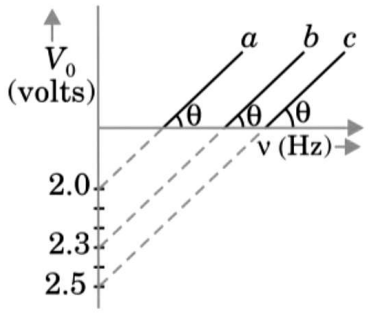
3) P-3; Q-4; R-1; S-2 4) P-4; Q-1; R-2; S-3

SPACE FOR ROUGH WORK

17. In a diffraction pattern due to a single slit of width 'a' the first minimum is observed at an angle 30 when light of wavelength $5000\,\text{Å}$ is incident on the slit. The first secondary maximum is observed at an angle of :

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

18. The following graph shows the variation of stopping potential with frequency for three different metals a, b and c. A light wave having wavelength 550 nm is falling on the metal surfaces a, b, c one by one. Which metal plate will generate photoelectric current?



1) plates a, b and c 2) plate a only

3) plates b and c 4) none of a, b and c

19. In a hydrogen atom, an electron is excited to the energy state of –1.511eV. What will be the speed of the electron in orbit, if V is the speed in its ground state?

1) Twice the speed of electron in ground state

2) Twice the speed of electron in ground state

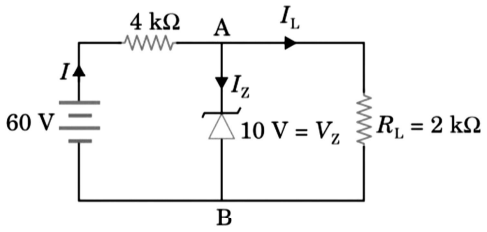
3) The orbital speed will remain same

4) One-third of the speed of electron in ground state

SPACE FOR ROUGH WORK

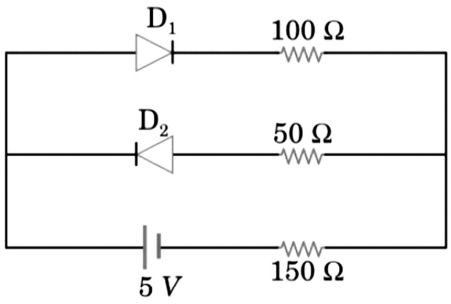
20. A Zener diode is connected to a battery and a load as shown below:

The currents I, I_Z and I_L are respectively



1) 15 mA, 5 mA, 10 mA
2) 15 mA, 7.5 mA, 7.5 mA
3) 12.5 mA, 5 mA, 7.5 mA
4) 12.5 mA, 7.5 mA, 5 mA

21. Two diodes, D_1 and D_2, each with forward resistance of 50Ω and infinite backward resistance are connected as shown in the circuit below. The current through the 150Ω resistance is:



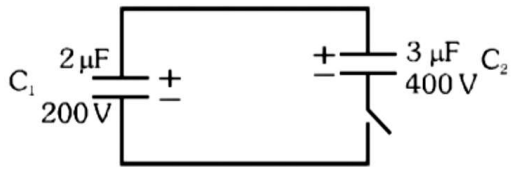
1)1.64
2) 0.032 A
3) 0.0167 A
4) zero

22. If radius of $_{13}Al^{27}$ nucleus is taken to be R_{Al}, then the radius of $_{53}Te^{125}$ nucleus is nearly

1) $\frac{5}{3}R_{Al}$
2) $\frac{3}{5}R_{Al}$
3) $\left(\frac{13}{53}\right)^{1/3} R_{Al}$
4) $\left(\frac{53}{13}\right)^{1/3} R_{Al}$

SPACE FOR ROUGH WORK

23. Two capacitors of capacity C_1 and C_2 are connected as shown in figure



Now the switch is closed. Calculate the charge on each capacitor.

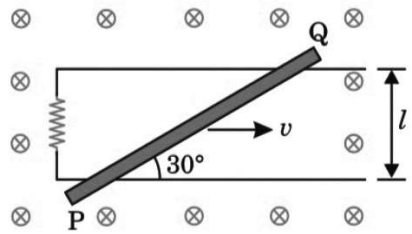
1) $620\,\mu C, 950\,\mu C$

2) $660\,\mu C, 910\,\mu C$

3) $640\,\mu C, 960\,\mu C$

4) $630\,\mu C, 980\,\mu C$

24. Rod PQ shown in figure is given an initial velocity *v*. Uniform magnetic field B is applied as shown. What will be the angle between acceleration and velocity of rod at t = 0 ?



1) 300^0

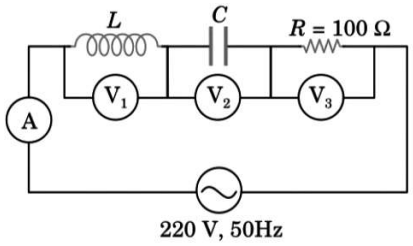
2) 90^0

3) 120^0

4) 150^0

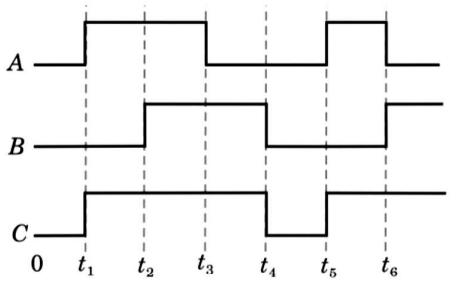
SPACE FOR ROUGH WORK

25. In the given circuit, the readings of voltmeter V_1 and V_2 are 300 volt each. The readings of the voltmeter V_3 and ammeter A are respectively:



1) 220 V, 2.0 A 2) 100 V, 2.0A 3) 150 V, 2.2 A 4) 220 V, 2.2 A

26. The figure shows a logic circuit with two inputs A and B and the output C. The voltage wave forms across A, B and C are as given. The logic circuit gate is:



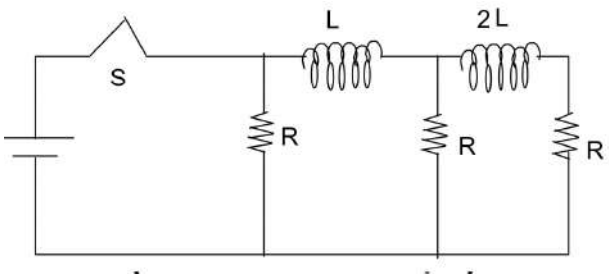
1) NAND gate 2) OR gate 3) NOR gate 4) AND gate

27. A particle having specific charge σ is projected in xy plane with a speed v. There exists a uniform magnetic field in z- direction having a fixed magnitude B_0. The field is made to reverse its direction after every interval of $\frac{2\pi}{\sigma B_0}$. Calculate the maximum separation (in m) between two positions of the particle during its course of motion. (Given $\frac{v}{\sigma B_0} = 2\text{metre}$) (neglect any other force including gravity throughout the motion).

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

SPACE FOR ROUGH WORK

28. In the circuit shown in the figure the current through each resistor is 'i' in steady state. Now switch 'S' is opened. After S is opened the heat dissipated in the circuit is (all inductors are ideal) (L is the self inductance).



1) Li^2 2) $2\ Li^2$

3) $3\ Li^2$ 4) $4\ Li^2$

29. **Assertion :** Work done in moving a charge on an equipotential surface is zero.

Reason : All the points on a equipotential surface are at the same potential.

1) Assertion is True, Reason is True, Reason is a Correct explanation for Assertion.

2) Assertion is True, Reason is True, Reason is not a correct explanation for Assertion.

3) Assertion is true, Reason is False

4) Both Assertion and Reason are False

30. The temperature coefficient of resistance of a wire is $0.00125\ C^{-1}$. At 300 K its resistance is one ohm. The resistance of the wire will be 2 ohm at

1) 1154 K 2) 2100 K

3) 1400 K 4) 1127 K

SPACE FOR ROUGH WORK

PART II - (CHEMISTRY)

31. Molal freezing point depression constant (K_f) may be calculated from the following thermodynamically derived equation (M = Molar mass of solvent) (L_{fus}: Latent heat of fusion)

1) $K_f = \frac{RT_f^2 \Delta H_{fus}}{1000}$

2) $K_f = \frac{RT_f^2}{1000 \Delta H^0_{fus}}$

3) $K_f = \frac{RMT_f^2}{1000 \Delta H_f^0}$

4) $K_f = \frac{T_f^2}{1000 L_{fus}}$

32. The most common dry cell is the Leclanche cell. It consists of a carbon (graphite) rod as cathode which is surrounded by powdered ..... and carbon black

1) Mn_3O_4

2) MnO

3) MnO_2

4) Mn_2O_5

33. The mixture that forms maximum boiling azeotrope is

1) Water + nitric acid

2) Ethanol + water

3) Acetone + carbon disulphide

4) n-Heptane + n-octane

34. **Assertion :** The enthalpy of reaction remains constant in the presence of a catalyst

Reason : A catalyst participating in the reaction, forms different activated complex and lowers down the activation energy but the difference in energy of reactant and product remains the same

1) Both assertion and reason are correct and reason is the correct explanation of assertion

2) Both assertion and reason are correct but does not explain assertion

3) Both assertion and reason are incorrect

4) Assertion is incorrect but reason is correct

SPACE FOR ROUGH WORK

35. Match the rate law given in column I with the dimensions of the rate constants given in column II and mark the appropriate choice

	Column I		Column II
A)	Rate = $k[NH_3]^0$	i	mol $L^{-1}s^{-1}$
B)	Rate = $k[H_2O_2][I^-]$	ii	Lmol $^{-1}s^{-1}$
C)	Rate = $k[CH_3CHO]^{3/2}$	iii	s^{-1}
D)	Rate = k $[C_2H_5Cl]$	iv	$L^{1/2}$ $mol^{-1/2}$ s^{-1}

1) $A \rightarrow iv, B \rightarrow iii, C \rightarrow ii, D \rightarrow i$
2) $A \rightarrow i, B \rightarrow ii, C \rightarrow iii, D \rightarrow iv$
3) $A \rightarrow ii, B \rightarrow i, C \rightarrow iv, D \rightarrow iii$
4) $A \rightarrow i, B \rightarrow ii, C \rightarrow iv, D \rightarrow iii$

36. Match the column I with column II and mark the appropriate choice

	Column I		Column II
A)	An element which can show +8 oxidation state	i	Ce
B)	An element with +7 as the most stable oxidation state in its oxides	ii	Pm
C)	Radioactive lanthanoid	iii	Os
D)	Lanthanoid which shows +4 oxidation state	iv	Mn

1) $A \rightarrow i, B \rightarrow ii, C \rightarrow iii, D \rightarrow iv$
2) $A \rightarrow ii, B \rightarrow iii, C \rightarrow iv, D \rightarrow i$
3) $A \rightarrow iv, B \rightarrow ii, C \rightarrow ii, D \rightarrow iii$
4) $A \rightarrow iii, B \rightarrow iv, C \rightarrow ii, D \rightarrow i$

SPACE FOR ROUGH WORK

37. The number of geomertic isomers that can exist for $\left[Zn(Cl)(py)(NH_3)(NH_2OH)\right]^+$ is $(py = pyridine)$

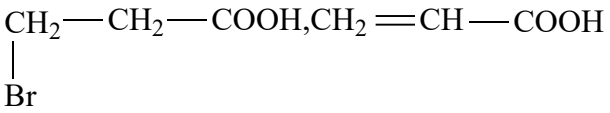
1) 4 2) 0 3) 2 4) 3

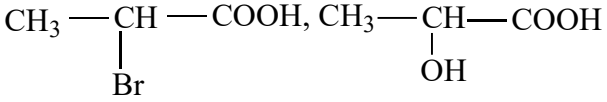
38. What are A and B in the following sequence of reactions

$$CH_3CH_2-COOH \xrightarrow[Br_2]{P} A \xrightarrow[ii)H^+]{(i)alc.KOH} B$$

1) 

2) $CH_3-CH_2-COBr, CH_2=CH-COOH$

3) 

4) 

39. **Assertion :** Hydrolysis of sucrose brings about a change in sign of rotation from dextro to laevo.

Reason : Hydrolysis always changes the optical rotation of a compound

1) If both assertion and reason are true, and reason is the correct explanation of the assertion

2) If both assertion and reason are true, and reason is not the correct explanation of the assertion

3) If assertion is true, but reason is false

4) If both assertion and reason are false

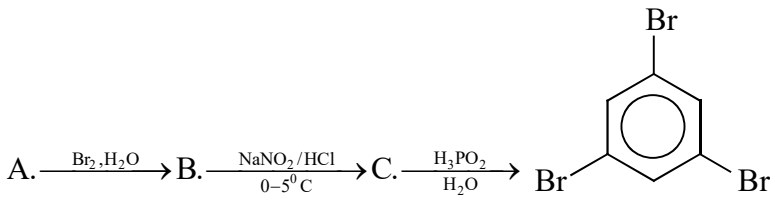
SPACE FOR ROUGH WORK

40. Among the following compounds basic amino acid is

1) Methionine 2) serine

3) Glutamic acid 4) lysine

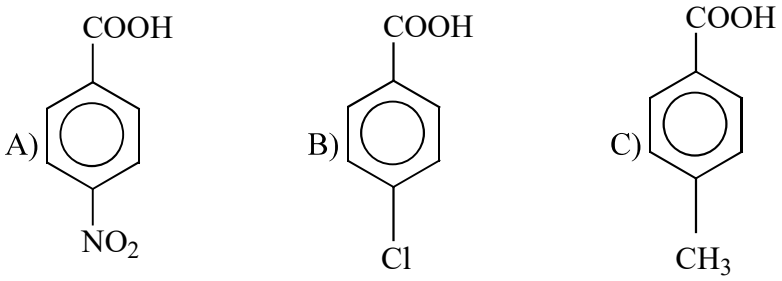
41. Compound A from the following reaction sequence is:



1) Benzoic Acid 2) Phenol

3) Salicylic Acid 4) Aniline

42. Among the acids given below



The correct order of decreasing strength is

1) A > B > C

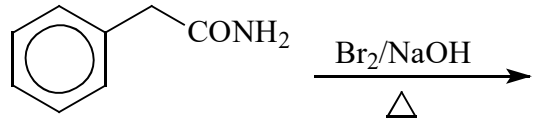
2) A > C > B

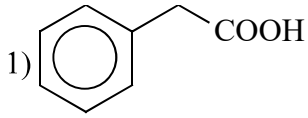
3) B > A > C

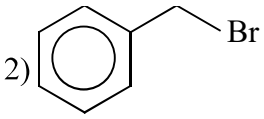
4) C > B > A

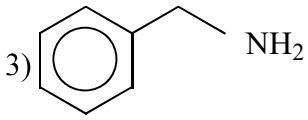
SPACE FOR ROUGH WORK

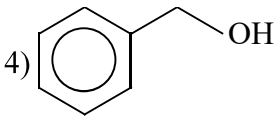
43. The major product formed in the following reaction is



1) 

2) 

3) 

4) 

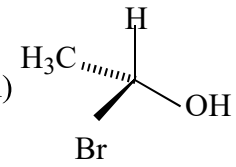
44. Among the following, compounds which will give positive iodoform reaction is .....

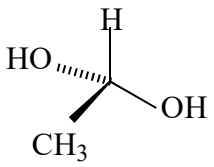
i) 1-Phenylbutan-2-one ii) 2-Methylbutan-2-ol

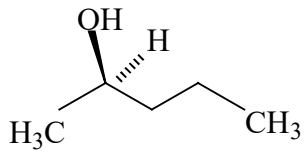
iii) 3-Methylbutan-2-ol iv) 1-Phenylethanol

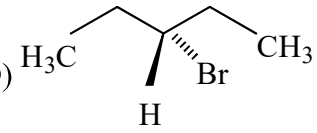
1) iii & iv 2) ii & iii 3) i & ii 4) i & iii

45. Identify the chiral compounds

A) 

B) 

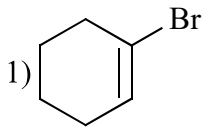
C) 

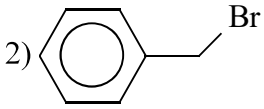
D) 

1) Both A & B 2) Both C & D 3) Both A & C 4) All of these

SPACE FOR ROUGH WORK

46. Compound from the following that will not undergoes nucleophilic substitution easily is

1) 

2) 

3) CH_3Br

4) $CH_2{=}CH{-}CH_2{-}Br$

47. For a reaction between A and B the order with respect to A is 2 and the order with respect to B is 1. The concentration of both A and B are doubled the rate will increase by a factor of

1) 2 2) 3

3) 4 4) 8

48. A 5A current is passed through a solution of zinc sulphate for 40 min. The amount of zinc deposited at the cathode is (Atomic mass of Zn = 65.39)

1) 40.65 g 2) 0.4065

3) 4.065 g 4) 65.04g

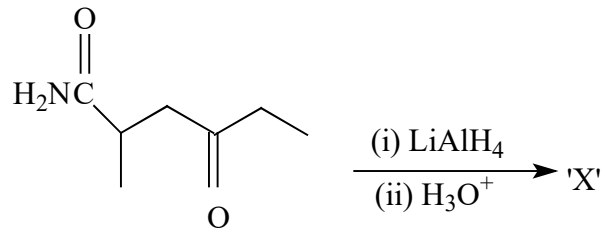
49. The half life of a reaction is doubled when the initial concentration is doubled. The order of the reaction is

1) 0 2) 4

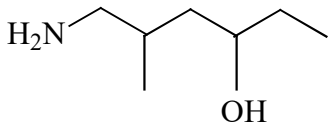
3) 1 4) 2

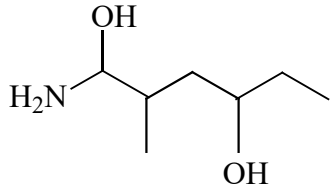
SPACE FOR ROUGH WORK

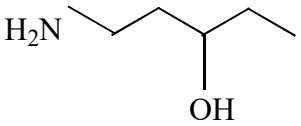
50. In the reaction given below:

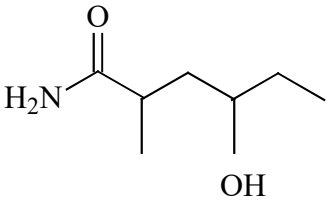


The product 'X' is:

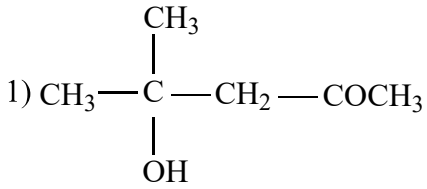
1) 

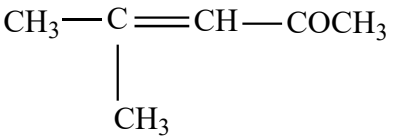
2) 

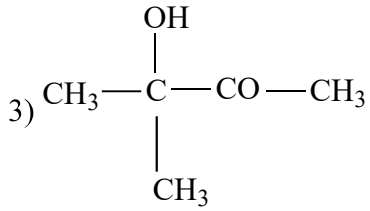
3) 

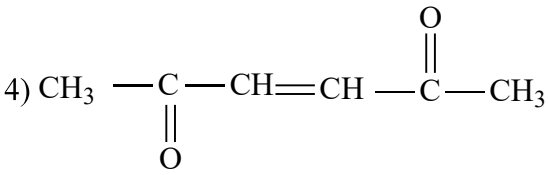
4) 

51. $2CH_3COCH_3 \xrightarrow[\Delta]{Ba(OH)_2} P$; The final product P is

1) 

2) 

3) 

4) 

SPACE FOR ROUGH WORK

52. Elevation in the boiling point for 1 molal solution of glucose is 2K. The depression in the freezing point for 2 molal solution of glucose in the same solvent is 2K. The relation between K_b and K_f is :

1) $K_b = 0.5\ K_f$ 2) $K_b = 2\ K_f$

3) $K_b = K_f$ 4) $K_b = 1.5\ K_f$

53. Which one of the following statements regarding Henry's law is not correct ?

1) The value of K_H is a function of the nature of the gas

2) Higher the value of K_H at a given pressure, higher is the solubility of the gas in the liquids

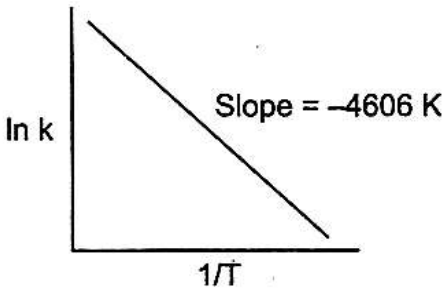
3) The partial pressure of the gas in vapour phase is proportional to the mole fraction of the gas in the solution

4) Different gases have different K_H (Henry's law constant) values at the same temperature

54. The weight of silver displaced by a quantity of electricity which displaces 5600 mL of O_2 at STP will be :

1) 5.4 g 2) 10.8 g 3) 54.9 g 4) 108.0 g

55. For a reaction, consider the plot of lnk versus 1/T given in the figure. The activation energy Ea of the reaction is



1) 38.27 kJ 2) 45 kJ 3) 18.32 kJ 4) 29.2 kJ

SPACE FOR ROUGH WORK

56. Which is correct statement?

1) Starch is a polymer of β-glucose

2) Amylose is a component of cellulose

3) Protiens are compounds of only one type of aminoacid

4) In cyclic structure of fructuse there are four carbons and one oxygen atom in the ring

57. Which one of the following alkenes when treated with HCl yields majorly an anti-Markovnikov product ?

1) $F_3C - CH = CH_2$ 2) $Cl - CH = CH_2$

3) $CH_3O - CH = CH_2$ 4) $H_2N - CH = CH_2$

58. Arrange the following compounds in increasing order of their reactivity in nucleophilic addition reaction

I) Benzaldehyde II) Tolualdehyde

III) p-Nitrobenzaldehyde IV) Acetophenone

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

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

59. **Statement I** : The stability of group 15 hydrides decreases from NH_3 to BiH_3

Statement II : The oxides of the type E_2O_3 of arsenic and antimony are amphoteric

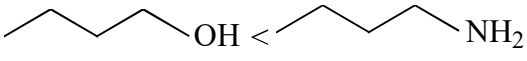
1) Both statement I and statement II are correct

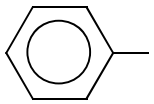
2) Statement I is incorrect but statement II is correct

3) Both statement I and statement II are incorrect

4) Statement I is correct but statement II is incorrect

SPACE FOR ROUGH WORK

60. **Statement I** : Boiling point of  $< NH_2$

Statement II : Basic nature of  $N(CH_3)_2 < CH_3NH_2$

1) Both statement I and statement II are correct

2) Statement I is incorrect but statement II is correct

3) Both statement I and statement II are incorrect

4) Statement I is correct but statement II is incorrect

PART III - (BIOLOGY)

61. Both autogamy and geitonogamy cannot occur in :

1) Papaya 2) Maize 3) Castor 4) Both 2 and 3

62. Some species of insects and frogs are cryptically coloured to avoid being detected easily by the Predator. It is known as:

1) Hibernation 2) Camouflage

3) Sexual deceit 4) Amensalism

63. During the process of isolation of DNA, chilled ethanol is added to :

1) Precipitate DNA

2) Break open the cell to release DNA

3) Facilitate action of restriction enzymes

4) Remove proteins such as histones

SPACE FOR ROUGH WORK

64. Progress of restriction enzyme can be detected by using :

1) PCR
2) Autoradiography
3) ELISA
4) Gel electrophoresis

65. **Assertion :** In most food chains members in successive higher trophic levels are fewer in number.

Reason : Number of organisms at any trophic level depends upon the availability of organisms which serve as food at the lower level.

1) If both assertion and reason are true and reason is the correct explanation of assertion.

2) If both assertion and reason are true but reason is not the correct explanation of assertion.

3) If assertion is true, but reason is false

4) If both assertion and reason are false

66. How many recombinant therapeutics are being marketed in the world and in India respectively ?

1) 8 and 10
2) 12 and 20
3) 15 and 12
4) 30 and 12

67. In a cross between a male and female, both heterozygous for sickle cell anemia gene, what percentage of the progeny will be diseased?

1) 50%
2) 75%
3) 25%
4) 100%

68. The aminoacid attaches to tRNA at its

1) 5' end
2) 3' end
3) Anticodon site
4) DHU loop

69. Species confined to any particular region and not found anywhere else is known as

1) Keystone species
2) Endemic species
3) Pandemic species
4) Endangered species

SPACE FOR ROUGH WORK

70. Pick out the correct statements

a) Haemophilia is a sex linked recessive disease

b) Down's syndrome is due to aneuploidy

c) Phenylketonuria is an autosomal recessive gene disorder

d) Sickle cell anaemia is an X-linked recessive gene disorder

1) a, c and d are correct
2) a, b and c are correct
3) a and d are correct
4) b and d are correct

71. Match the following

Column I		Column II	
a)	Ganga action plan	1)	The ministry of environment and forests
b)	Biogas plant	2)	KVIC and IARI
c)	Primary treatment	3)	Biological treatment
d)	Secondary treatment	4)	Physical treatment

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

72. In 1981, the r value for human population in India was

1) 0.205 2) 0.0205 3) 0.12 4) 0.015

73. The annual net primary productivity of entire biosphere is

1) 170 million tons
2) 170 billion tons
3) 117 million tons
4) 117 billion tons

SPACE FOR ROUGH WORK

74. The protein coded by the cry genes cryIAc and cryIIAb are effective in controlling

1) Cotton bollworms 2) Maize stem borer

3) Nematode 4) All the above

75. The part of megasporangium which differentiate the megaspore mother cell is

1) Integument 2) Nucellus 3) Chalaza 4) Funicle

76. High value of BOD (Biochemical Oxygen Demand) indicates that

1) Water is pure

2) Water is highly polluted

3) Water is less polluted

4) Water contain more oxygen

77. An allele is said to be dominant if

1) It is expressed only in heterozygous combination

2) It is expressed only in homozygous combination

3) It is expressed in both homozygous and heterozygous condition.

4) It is expressed only in second generation.

78. What would be the genotype of both mother and father of blood group A and B if they had an offspring with 'O' group?

1) Mother is homozygous for 'A' blood group and father is heterozygous for 'B'.

2) Mother is hetrozygous for 'A' blood group and father is homozygous for 'B'

3) Both mother and father are heterozygous for 'A' and 'B' blood group, respectively

4) Both mother and father are homozygous for 'A' and 'B' blood group, respectively.

SPACE FOR ROUGH WORK

79. Thymine can also be designated as

1) 3– Methyl uracil
2) 2 – Methyl uracil
3) 4– Methyl uracil
4) 5 – Methyl Uracil

80. Some of the steps of DNA fingerprinting are given below. Identify their correct sequence from the options given.

A)Electrophoresis of DNA fragments

B) Hybridisation with DNA probe

C) Digestion of DNA by restriction endonucleases

D) Autoradiography

E) Blotting of DNA fragments to nitrocellulose membrane

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

81. Menstrual flow occurs due to the declining level of

1)Progesterone
2) FSH
3) Oxytocin
4) Vasopressin

82. The permissible use of amniocentesis is for

1) Detecting any genetic abnormality

2) Detecting sex of unborn foetus

3) Artificial insemination

4) Transfer of embryo into the uterus of a surrogate mother

SPACE FOR ROUGH WORK

83. Where we can observe sporozoites of malarial parasite?

1) Salivary glands of freshly moulted female Anopheles mosquito

2) Salivary gland of infected female Anopheles mosquito

3) RBC of humans suffering from malaria

4) Spleen of infected humans

84. At which stage of HIV infection does one usually show symptoms of AIDS?

1) Within 15 days of sexual contact with an infected person

2) When the infected retrovirus enters host cells

3) When HIV damages large number of helper T cells

4) When the viral DNA is produced by reverse transcriptase

85. Lymphoid tissues present in small intestine, along the ileum is

1) Spleen

2) Peyer's patches

3) Tonsils

4) Lymph nodes

86. Pick up the wrong statement from the following

1) Spleen acts as a secondary lymphoid organ

2) The substances which produce allergy are called allergens

3) The drug coccaine is chemically diacetyl morphine

4) Each antibody is represented as H_2L_2

SPACE FOR ROUGH WORK

87. Match Column I and Column II and choose the correct combination from the options given below

Column I		Column II	
a)	Homologous organ	1)	Potato and Sweet potato
b)	Analogous organ	2)	Tendril of cucurbita and thorn of Bougainvillea
c)	Adaptive radiation	3)	Fossils
d)	Paaeontological evidence	4)	Australian marsupials

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

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

88. **Assertion :** Copper T is an effective contraceptive device in human females.

Reason : Copper T supresses the sperm motility and the fertilizing capacity of sperms.

1) If both Assertion & Reason are true and the Reason is a correct explanation of Assertion

2) If both Assertion & Reason are true and the Reason is not a correct explanation of Assertion

3) If the Assertion is true but Reason is false

4) If the Assertion is false but Reason is true

89. Which of the following was most similar to modern man?

1) Java man 2) Neanderthal man

3) Homo habilis 4) Cro Magnon man

90. Assisted reproductive technology, IVF involves transfer of

1) Embryo 16 blastomeres into the fallopian tube

2) Ovum into the fallopian tube

3) Zygote into the fallopian tube

4) Zygote into the uterus

SPACE FOR ROUGH WORK

PART IV - (MATHEMATICS)

91. If $f(x) = \frac{x}{\sqrt{1+x^2}}$, then (fof of)(x) is

1) $\frac{3x}{\sqrt{1+x^2}}$ 2) $\frac{x}{\sqrt{1+3x^2}}$

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

92. If $y = \sqrt{\left(\frac{1+\cos 2\theta}{1-\cos 2\theta}\right)}$, then $\frac{dy}{d\theta}$ at $\theta = \frac{3\pi}{4}$ is :

1) -2 2) 2

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

93. The number of solutions of $\frac{dy}{dx} = \frac{y+1}{x-1}$, when $y(1) = 2$ is

1) None 2) One 3) Two 4) Infinite

94. The probability of getting sum more than 7 when a pair of dice are thrown is

1) $\frac{7}{36}$ 2) $\frac{5}{12}$

3) $\frac{7}{12}$ 4) $\frac{5}{36}$

SPACE FOR ROUGH WORK

95. The probability that a card drawn from a pack of 52 cards will be a diamond or king is

1) $\frac{1}{52}$ 2) $\frac{2}{13}$

3) $\frac{4}{13}$ 4) $\frac{1}{13}$

96. The interval in which the function $f(x)=\frac{4x^2+1}{x}$ is strictly decreasing is:

1) $\left(-\frac{1}{2},\frac{1}{2}\right)$ 2) $\left[-\frac{1}{2},\frac{1}{2}\right]$

3) (–1, 1) 4) [–1, 1]

97. If $\int\frac{e^x(1+\sin x)dx}{1+\cos x}=e^x f(x)+C,\text{then } f(x)\text{ is equal to}$

1) $\sin\frac{x}{2}$ 2) $\cos\frac{x}{2}$

3) $\tan\frac{x}{2}$ 4) $\log\frac{x}{2}$

98. The curve given by x+y= e^{xy} has a tangent parallel to the Y-axis at the point

1) (0, 1) 2) (1, 0)

3) (1, 1) 4) (–1, 1)

SPACE FOR ROUGH WORK

99. The area enclosed between the curve $y= \log_e(x+e)$ and the coordinate axes is

1) 1 2) 2

3) 3 4) 4

100. The lines $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z-4}{-k}$ and $\frac{x-1}{k}=\frac{y-4}{2}=\frac{z-5}{1}$ are coplanar if

1) k= 3 or –2 2) k = 0 or–1

3) k = 1 or –1 4) k = 0 or –3

101. $\tan^{-1}\left(\frac{1}{4}\right)+\tan^{-1}\left(\frac{2}{9}\right)$ is equal to

1) $\frac{1}{2}\cos^{-1}\left(\frac{3}{5}\right)$ 2) $\frac{1}{2}\sin^{-1}\left(\frac{3}{5}\right)$

3) $\frac{1}{2}\tan^{-1}\left(\frac{3}{5}\right)$ 4) $\tan^{-1}\left(\frac{1}{2}\right)$

102. $\int\frac{x+3}{(x+4)^2}e^x dx$ is equal to

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

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

SPACE FOR ROUGH WORK

103. The shortest distance between the lines $\frac{x-3}{2}=\frac{y-2}{3}=\frac{z-1}{-1}$ and $\frac{x+3}{2}=\frac{y-6}{1}=\frac{z-5}{3}$ is :

1) $\frac{18}{\sqrt{5}}$

2) $\frac{22}{3\sqrt{5}}$

3) $\frac{46}{3\sqrt{5}}$

4) $6\sqrt{3}$

104. Given $2x - y + 2z = 2$, $x - 2y + z = -4$, $x + y + \lambda z = 4$, then the value of λ such that the given system of equation has no solution is

1) -3

2) 1

3) 0

4) 3

105. Let $A=\begin{bmatrix}1 & -1 & 1\\ 2 & 1 & -3\\ 1 & 1 & 1\end{bmatrix}$ and $10B=\begin{bmatrix}4 & 2 & 2\\ -5 & 0 & \alpha\\ 1 & -2 & 3\end{bmatrix}$. If B is the inverse of A, then the value of α is

1) 4

2) -4

3) 3

4) 5

SPACE FOR ROUGH WORK

106. Let $p,q,\in R,q\neq 0,$ Define a function $f(x)=\begin{cases} p\sin\left(\frac{\pi x}{2}-\frac{\pi}{2}\right), \text{for } x\leq 0 \\ \frac{\tan x-\sin x}{qx^3}, \text{for } x>0 \end{cases}$

If f is continuous at x = 0, then 15-10pq is equal to

1) 20 2) 25

3) 35 4) 17

107. If $\frac{dy}{dx}+y\tan x=2\sin x, 0<x<\frac{\pi}{2}$ and $y\left(\frac{\pi}{3}\right)=0$, then

1) $y\sec x=2\log\frac{1}{2\sin x}$

2) $y\sec x+2\log(2\cos x)=0$

3) $y\sec x-2\log(2\cos x)=0$

4) $y\sec x-2\log(2\sin x)=0$

108. If the mirror image of the point p(3,4,9) in the line $\frac{x-1}{3}=\frac{y+1}{2}=\frac{z-2}{1}$ is (a,b,c), then $21(a+b+c)$ is equal to

1) 182 2) 172

3) 162 4) 192

SPACE FOR ROUGH WORK

109. If $f(x)=\begin{vmatrix} x^2 & 2x+3 & x^2-1 \\ 2x & x+2 & x+5 \\ x^3-x & x^2+2 & 4 \end{vmatrix}$ for all $x \in R$, then $f(0)+f'(0)$ is equal to

1) 45 2) 35

3) –35 4) –45

110. If the system of equations $2x+7y+\lambda z=3, 3x+2y+5z=4$ and $x+\mu y+32z=-1$ has infinitely many solutions then $\frac{2(\lambda-\mu)}{19}=$

1) 4 2) 8

3) 38 4) 76

111. If the random variable X takes the values $x_1, x_2, x_3, ..., x_{10}$ with probabilities $p(X=xi)=ki,$ then the value of k is

1) $\frac{1}{10}$ 2) $\frac{1}{15}$

3) $\frac{1}{55}$ 4) 55

SPACE FOR ROUGH WORK

112. If $3\vec{p}+2\vec{q}=\hat{i}+\hat{j}+\hat{k}$ and $3\vec{p}-2\vec{q}=\hat{i}-\hat{j}-\hat{k}$ then the angle between $\vec{p}$ and $\vec{q}$ is

1) $\frac{\pi}{2}$

2) $\frac{\pi}{4}$

3) $\frac{\pi}{6}$

4) $\frac{\pi}{3}$

113. If $A=\begin{bmatrix}1 & 0 & 0\\ x & 1 & 0\\ x & x & 1\end{bmatrix}$ and $I=\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{bmatrix}$, then $A^3-3A^2+3A=$

1) 3I

2) –I

3) I

4) –2I

114. If $y=\frac{x+\sqrt{x}+x\sqrt{x}}{\left(1+\sqrt{x}\right)\left(x^2-\sqrt{x}\right)}+\frac{1+\sqrt{x}\left(x\sqrt{x}+\sqrt{x}\right)}{x^3-1}$, then $\left|y'\left(\frac{1}{2}\right)\right|$ is equal to

1) 2

2) 4

3) 6

4) 8

SPACE FOR ROUGH WORK

115. $\int_{\frac{\pi}{3}}^{2\frac{\pi}{3}} \sqrt{1-\sin x}\,dx = \alpha + \beta\sqrt{2} + \gamma\sqrt{3}$, then $\alpha + 2\beta + 3\gamma =$

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

116. The probability that the 13th day of a randomly chosen month is a second Saturday

1) $\frac{1}{7}$ 2) $\frac{1}{12}$

3) $\frac{1}{84}$ 4) $\frac{19}{84}$

117. If $P(A) = \frac{1}{4}, P(\overline{B}) = \frac{1}{2}$ and $P(A \cup B) = \frac{5}{9}$ then $P(A / B)$ is

1) $\frac{7}{72}$ 2) $\frac{7}{18}$

3) $\frac{7}{9}$ 4) $\frac{7}{36}$

118. Four persons can hit a target correctly with probabilities $\frac{1}{3}, \frac{1}{6}, \frac{1}{7}$ and $\frac{1}{8}$ respectively. If all hit at the target independently, then the probability that the target would be hit, is

1) $\frac{25}{32}$ 2) $\frac{17}{32}$

3) $\frac{7}{12}$ 4) $\frac{5}{12}$

SPACE FOR ROUGH WORK

119. Equation of the line joining A(1,–1,2) and B (3,2,–1) is

1) $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-2}{-3}$

2) $\frac{x-1}{2}=\frac{y-1}{-3}=\frac{z+2}{3}$

3) $\frac{x+1}{2}=\frac{y-1}{3}=\frac{z-2}{-3}$

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

120. Point of intersection of lines $\bar{r}=\left(\hat{i}-\hat{j}+2k\right)+\lambda\left(\hat{i}+\hat{k}\right)$ and $\bar{r}=\left(-2\hat{i}-2\hat{j}+\hat{k}\right)+\mu\left(4\hat{i}+\hat{j}+2\hat{k}\right)$ is

1) (2,1,–3)

2) (–2,1,–3)

3) (–2,–1,3)

4) (2, – 1, 3)

SPACE FOR ROUGH WORK