

ISMART
SAMPLE PAPER
FOR CLASS 12⁺ (MEDICAL)

Test ID :

Time : 1.5 hrs.

M. Marks: 360

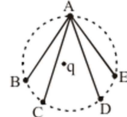
SYLLABUS & SCHEME		
SUBJECTS	Qs.	SYLLABUS
PHYSICS	22	XII Syllabus
CHEMISTRY	22	XII Syllabus
BIOLOGY (BOTANY + ZOOLOGY)	46	XII Syllabus

INSTRUCTIONS TO CANDIDATE

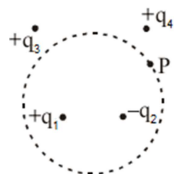
- Each subject in this paper consists of multiple choice questions with only one correct answer. **+4 marks** will be awarded for correct answer and **-1 mark** for wrong answer.
- Please read the instructions given for each question carefully and fill the correct answer against the question numbers on the answer sheet in the respective subject.
- **Use blue or black ball point pen to darken the appropriate circle & mark should completely fill the circle.**
- The Question paper contains blank spaces for your rough work. No additional sheet will be provided for rough work.
- Blank papers, Clipboards, Log Tables, Slide rule, Calculators, Cellular phones, Pagers and Electronic gadgets in any form are not allowed.
- Write your Name, Student ID in the block at the top of the Answer Sheet. Also write your Name & Student ID in the space provided on this cover page of question paper.

Name: _____ Student ID _____

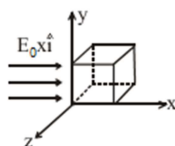
PHYSICS

1. If distance between the points (3m, am) and (4m, 5m) is $\sqrt{10}$ m. Find the value of a :
 (A) -2 (B) -8
 (C) 8 (D) 10
2. The side of a equilateral triangle is increasing at the rate of 0.2 cm/s. The rate of increase of perimeter w.r.t. time is:
 (A) 0.2 cm/s (B) 0.4 cm/s
 (C) 0.6 cm/s (D) 0.8 cm/s
3. The length, breadth and thickness of a block are given by $l = 12$ cm, $b = 6$ and $t = 2.45$ cm. The volume of the block according to the idea of significant figures should be
 (A) 1×10^2 cm³ (B) 2×10^2 cm³
 (C) 1.763×10^2 cm³ (D) None of these
4. The angle made by the vector $\vec{A} = (12\hat{i} + 3\hat{j} - 4\hat{k})$ with the X axis is :
 (A) $\sin^{-1}\left(\frac{5}{12}\right)$ (B) $\tan^{-1}\left(\frac{5}{13}\right)$
 (C) $\cos^{-1}\left(\frac{12}{13}\right)$ (D) $\cot^{-1}\left(\frac{4}{3}\right)$
5. Which of the following forces cannot be a resultant of 5N force and 7N force
 (A) 2 N (B) 10 N
 (C) 14 N (D) 5 N
6. The dimension of coefficient of viscosity is
 (A) $[M^{-1}L^{-1}T^{-1}]$ (B) $[M^1L^{-1}T^{-1}]$
 (C) $[M^1L^{-2}T^{-2}]$ (D) $[M^1L^{-1}T^1]$
7. If density (ρ), distance (L) and universal gravitational constant (G) are taken as fundamental quantities, the dimension of pressure (P) are :
 (A) $[\rho^2L^2G^{-1}]$ (B) $[\rho^2L^2G^1]$
 (C) $[\rho^2L^{-2}G^1]$ (D) $[\rho^2L^{-2}G^{-1}]$
8. The ratio of SI unit to CGS unit of universal gravitational constant (G) is :
 (A) 10^6 (B) 10^3
 (C) 10^{-3} (D) 10^{-5}
9. What is the percentage error in the volume of a cube when error in measuring its side is 2% :
 (A) 2% (B) 4%
 (C) 6% (D) 8%
10. Percentage error in measuring the radius and mass of a ring are 2% and 1% respectively. Then error in measurement of moment of inertia about its diameter is:
 (A) 8% (B) 3%
 (C) 4% (D) 5%
11. If a unit charge is taken from one point to another over an equipotential surface, then :
 (A) Work is done on the charge (B) Work is done by the charge
 (C) Work on the charge is constant (D) No work is done
12. In the electric field of a point charge q, a certain charge is carried from point A to B, C, D and E. Then work done is

 (A) is least along the path AB (B) is least along the path AD
 (C) is zero through any one of the path AB, AC, AD and AE (D) is least along AE
13. A charge q is placed at the centre of the line joining two equal charges Q. The system of the three charges will be in equilibrium if q is equal to :
 (A) $\frac{-Q}{2}$ (B) $\frac{-Q}{4}$
 (C) $\frac{+Q}{2}$ (D) $\frac{+Q}{4}$
14. Two electric charges 2q and 8q are placed at a distance of 6a on a horizontal plane. The distance of the location of the point from charge 2q where the electric field is zero
 (A) 2.5a (B) 1.5a
 (C) a (D) 2a
15. Two point charges 24 μ C and 16 μ C are placed 10 cm apart. The work done to bring them closer by 4 cm will be approximately :
 (A) 23 J (B) 32 J
 (C) 2.3 J (D) 230 J
16. The dielectric constant of an insulator may be (out of the options, which one is possible) :
 (A) ∞ (B) zero
 (C) -2 (D) 6

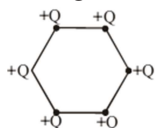
17. In a region the potential is represented by $V(x, y, z) = 6x - 8xy - 8y + 6yz$, where V is in volts and x, y, z are in metres. The electric force experienced by a charge of 2 coulomb situated at point $(1, 1, 1)$ is :-
 (A) 30 N (B) 24 N
 (C) $4\sqrt{35}$ N (D) $6\sqrt{5}$ N
18. A soap bubble is given a negative charge, then its radius :
 (A) decreases (B) increases
 (C) remains unchanged (D) nothing can be predicted
19. Consider the Gaussian surface that surrounds part of the charge distribution shown in fig. Then the contribution to the electric field E at point P arise from charges :



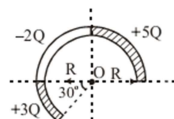
- (A) q_1 and q_2 only (B) q_3 and q_2 only
 (C) q_1, q_2, q_3 and q_4 only (D) none of these
20. Calculate the flux through the cube shown in fig. for $\vec{E} = E_0 x \hat{i}$: (side of cube is a)



- (A) $E_0 a^2$ (B) $E_0 a^3$
 (C) $E_0 a^4$ (D) Zero
21. The work done required to put the six charges together at the corners of a regular hexagon is :



- (A) $\frac{6kQ^2}{a} + \frac{3kQ^2}{2a}$ (B) $\frac{6kQ^2}{a} + \frac{6kQ^2}{\sqrt{3}a}$
 (C) $\frac{6kQ^2}{a} + \frac{6kQ^2}{\sqrt{3}a} + \frac{3kQ^2}{2a}$ (D) $\frac{6kQ^2}{a} + \frac{3kQ^2}{\sqrt{3}a} + \frac{6kQ^2}{2a}$
22. An arc of radius R is shown in the figure, find the potential at its centre :



- (A) $\frac{6kQ}{R}$ (B) $\frac{5kQ}{R}$
 (C) $\frac{\sqrt{3}kQ}{R}$ (D) $\frac{\sqrt{2}kQ}{R}$

CHEMISTRY

23. Match the oxide given in column I with its property given in column II.

Column I	Column II
(i) Na_2O	A. Neutral
(ii) Al_2O_3	B. Basic
(iii) N_2O	C. Acidic
(iv) Cl_2O_7	D. Amphoteric

Which of the following options has all correct pairs?

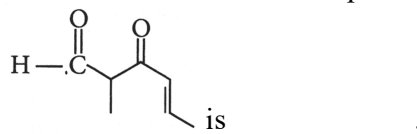
- (A) (i)-B, (ii)-A, (iii)-D, (iv)-C (B) (i)-C, (ii)-B, (iii)-A, (iv)-D
 (C) (i)-A, (ii)-D, (iii)-B, (iv)-C (D) (i)-B, (ii)-D, (iii)-A, (iv)-C
24. The correct order of increasing bond length of C – H, C – O, C – C and C = C is
 (A) C – H < C = C < C – C < C – O (B) C – C < C = C < C – O < C – H
 (C) C – O < C – H < C – C < C = C (D) C – H < C – O < C – C < C = C

25. Match List – I with List – II

List I	List II
(A) PCl_5	(i) Square pyramidal
(B) SF_6	(ii) Trigonal planar
(C) BrF_5	(iii) Octahedral
(D) BF_3	(iv) Trigonal bipyramidal

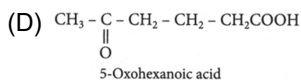
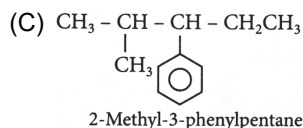
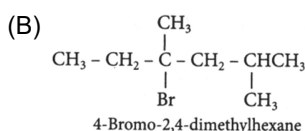
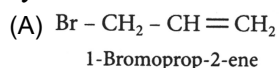
Choose the correct answer from the options given below :

- (A) (A) – (iv), (B) – (iii), (C) – (ii), (D) – (i) (B) (A) – (iv), (B) – (iii), (C) – (ii), (D) – (i)
 (C) (A) – (ii), (B) – (iii), (C) – (iv), (D) – (i) (D) (A) – (iii), (B) – (i), (C) – (iv), (D) – (ii)
26. Which of the following is paramagnetic?
 (A) N_2 (B) H_2
 (C) Li_2 (D) O_2
27. The IUPAC name of the compound



- (A) 5-formylhex-2-en-3-one (B) 5-methyl-4-oxohex-2-en-5-al
 (C) 3-keto-2-methylhex-5-enal (D) 3-keto-2-methylhex-4-enal

28. Which nomenclature is not according to IUPAC system?

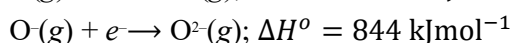


29. Removal of 2nd electron for an element is always :

(A) Endothermic (B) Endothermic for Mg, Be, N

(C) Exothermic for Mg, Be, N and Noble gases (D) Depends of electronic configuration

30. The formation of oxide ion, $\text{O}^{2-}(\text{g})$ requires first an exothermic and then an endothermic step as shown below :

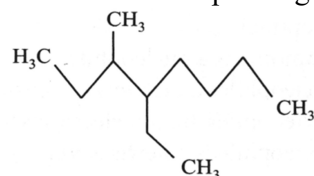


This is because :

(A) oxygen is more electronegative (B) oxygen has high electron affinity

(C) O^- ion will tend to resist the addition of another electron (D) O^- has comparatively larger size than oxygen atom

31. Name of the compound given below is

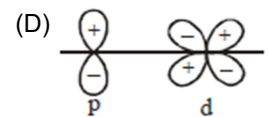
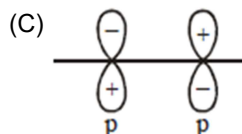
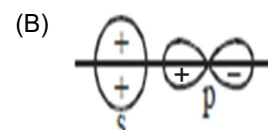
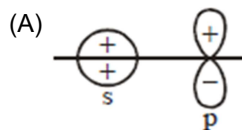


- (A) 4-ethyl-3-methyloctane (B) 3-methyl-4-ethyloctane
(C) 2,3-diethylheptane (D) 5-ethyl-6-methyloctane

32. The IUPAC name for $\text{CH}_3\text{CH}=\underset{\text{NH}_2}{\text{CH}}\text{CH}_2\text{CH}_2\text{COOH}$ is

- (A) 3-amino-5-heptenoic acid (B) β -amino- δ -heptenoic acid
(C) 5-amino-2-heptenoic acid (D) 5-amino-hex-2-enecarboxylic acid

33. Which of the following leads to bonding?



34. Which of the following has largest bond angle.

- (A) H_2O (B) F_2O
(C) Cl_2O (D) H_2S

35. The most stable carbocation, among the following is

- (A) $(\text{CH}_3)_3\text{C}-\overset{+}{\text{C}}\text{H}-\text{CH}_3$ (B) $\text{CH}_3-\text{CH}_2-\overset{+}{\text{C}}\text{H}-\text{CH}_2-\text{CH}_3$
(C) $\text{CH}_3-\overset{+}{\text{C}}\text{H}-\text{CH}_2-\text{CH}_2-\text{CH}_3$ (D) $\text{CH}_3-\text{CH}_2-\overset{+}{\text{C}}\text{H}_2$

36. C_2H_2 is isostructural with :

- (A) H_2O_2 (B) NO_2
(C) SnCl_2 (D) CO_2

37. According to VSEPR theory which of the following molecules is (are) bent (non-linear)?

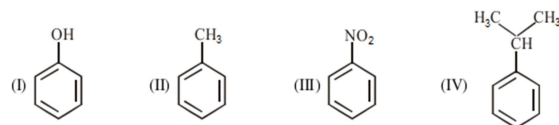
I. CO_2 II. C_2H_2 III. O_3 IV. BeCl_2 V. KrF_2

- (A) All of these (B) III, IV
(C) III, IV, V (D) Only III

38. Which of the following pair of species have identical shapes?

- (A) NO_2^+ and NO_2^- (B) PCl_5 and BrF_5
(C) XeF_4 and ICl_4^- (D) TeCl_4 and XeO_4

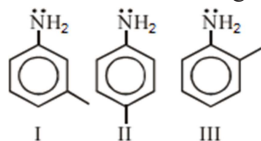
39. Which of the following order is correct for decreasing electron density in benzene ring



- (A) (I) > (IV) > (II) > (III) (B) (I) > (III) > (II) > (IV)
(C) (IV) > (II) > (I) > (III) (D) (I) > (II) > (IV) > (III)

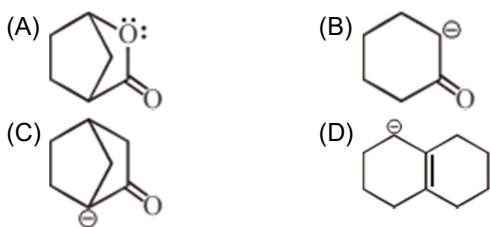
40. The radical, $\text{C}_6\text{H}_5\dot{\text{C}}\text{H}_2$ is aromatic because it has
 (A) 7 p -orbitals and 7 unpaired electrons
 (B) 6 p -orbitals and 7 unpaired electrons
 (C) 6 p -orbitals and 6 unpaired electrons
 (D) 7 p -orbitals and 6 unpaired electrons

41. Choose the correct order of basic strength?



- (A) III > II > I
 (B) III > I > II
 (C) II > I > III
 (D) I > II > III
42. Which of the following has strong +I effect?
 (A) $\text{O}^\ominus$
 (B) $-\text{Et}$
 (C) $-\text{CH}_3$
 (D) $-\text{NH}-\text{CH}_3$

43. Which of the following compound is not resonance stabilized?



44. Dipole moment of NF_3 is smaller than :-

- (A) NH_3
 (B) CO_2
 (C) BF_3
 (D) CCl_4

BIOLOGY

45. Genetic variations affect the production of the drug reserpine in the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges. What kind of diversity does it indicate?
 (A) Species diversity
 (B) Genetic diversity
 (C) Ecological diversity
 (D) None of these
46. An American plant which is a troublesome water weed in India is
 (A) Parthenium
 (B) Typha
 (C) Trapa
 (D) Eichhornia
47. Fish used in biological control of mosquitos is :
 (A) Hilsa
 (B) Gambusia
 (C) Pomfret
 (D) Catla catla

48. Species diversity increases as one proceeds from
 (A) Low altitudes to high altitudes and from low latitude to high latitudes
 (B) Low altitude to high altitude and from high latitudes to low latitudes
 (C) High altitude to low altitude and from low latitudes to high latitudes
 (D) High altitudes to low altitudes and from high latitude to low latitudes

49. Match the following columns –

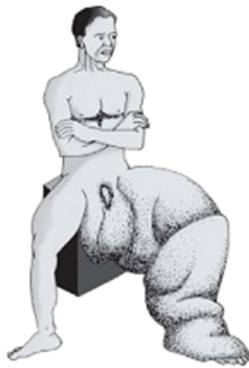
	Column I		Column II
(i)	Dodo	(a)	Africa
(ii)	Quagga	(b)	Russia
(iii)	Thylacine	(c)	Mauritius
(iv)	Stellar's Sea cow	(d)	Australia

Choose the correct match from following :

- (A) (i) - a, (ii) - c, (iii) - b, (iv) - d
 (B) (i) - d, (ii) - c, (iii) - a, (iv) - b
 (C) (i) - c, (ii) - a, (iii) - b, (iv) - d
 (D) (i) - c, (ii) - a, (iii) - d, (iv) - b
50. The Extinction of Passenger Pigeon was due to :
 (A) Increased No. of Predatory birds
 (B) Over exploitation by humans
 (C) Non-availability of food
 (D) Bird flu virus Infection

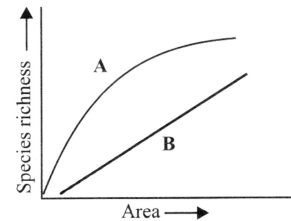
51. Which one of the following cause of biodiversity loss, is because of mutualism?
 (A) Habitat fragmentation
 (B) Over exploitation
 (C) Co-extinctions
 (D) Alien species invasions
52. Which disease showing common symptoms like stomach pain, 39° to 40°C fever, weakness & loss of appetite
 (A) Typhoid
 (B) Pneumonia
 (C) Common cold
 (D) Malaria
53. Which bacteria is responsible for the disease Pneumonia in humans ?
 (A) Streptococcus Pneumoniae
 (B) Haemophilus influenzae
 (C) Rhino virus
 (D) Both A and B

54. Diagram showing inflammation in one of the lower limbs due to ?



- (A) Epidermophyton (B) Filariasis
(C) Ascariasis (D) Sporozoites
55. Which lymphocyte is mainly infected by HIV.
(A) Cytotoxic Lymphocytes T-(B) Helper Lymphocytes T-
(C) Supressor Lymphocytes T-(D) Memory Lymphocytes T-
56. Virus infected cells secrete Proteins called
(A) Interlukins (B) Interferons
(C) Monokines (D) Lymphokines
57. How many types of acquired immune responses found in humans
(A) One (B) Two
(C) Five (D) Four
58. When a host is exposed to antigen, antibodies are Produced in the host body this type of immunity is called ?
(A) Passive immunity (B) Passive Natural immunity
(C) Active immunity (D) Innate immunity
59. Which antibodies secrete during allergy ?
(A) IgG (B) IgM
(C) IgD (D) IgE
60. Diagnostic test for AIDS is ?
(A) EILSA (B) Widal test
(C) Tourniquet test (D) Enzyme linked immuno sorbent assay
61. Smack is chemically ?
(A) Diacetyl morphine (B) Diethyl morphine
(C) Ethyl alcohol (D) 3-4 Diacetylmorphine

62. Which antibodies is responsible for activation of mast cell ?
(A) IgA (B) IgE
(C) IgG (D) IgM
63. MALT contributes how many percentage of total Lymphoid tissues.
(A) 15% (B) 25%
(C) 50% (D) 75%
64. Contact inhibition is the Property of
(A) Carcinoma (B) Sarcoma
(C) Normal cell (D) Malignant tumor
65. Primary Lymphoid organ is
(A) Spleen (B) Tonsils
(C) Bone marrow (D) Pineal Gland
66. Tropics (23.5°N and 23.5°S) have _____ species as compared to temperate or polar regions.
(A) less (B) equal
(C) more (D) none of these
67. Which option correctly describes the equations for curves A and B, in the given graph of species – area relationship?



- A B
(A) $S = CA^z$ $\log S = \log C + Z \log A$
(B) $\log S = \log C + Z \log A$ $S = CA^z$
(C) $\log C = \log S + Z \log A$ $S = CA^z$
(D) $S = CA^z$ $\log C = \log S + Z \log A$
68. Motile zygote of Plasmodium occurs in :
(A) Human RBCs (B) Human liver
(C) Gut of female Anopheles (D) Salivary glands of Anopheles
69. Fill in the blanks with the most appropriate option.
The value of z-lies in the range of _____ regardless of the taxonomic group or the region.
(A) 0.1 to 0.2 (B) 0.3 to 0.8
(C) 0.1 to 1.0 (D) 0.6 to 1.8

70. Liver cirrhosis is due to ?
 (A) Chronic use of drugs (B) Chronic use of Alcohol
 (C) Misuse of Atropa (D) Excessive use of balladonna cannabinoids

71. What is the correct sequence of enzyme action?
 (A) $E + S \rightleftharpoons EP \rightarrow E + S$ (B) $E + S \rightarrow ES \rightleftharpoons EP \rightleftharpoons E + P$
 (C) $E + P \rightleftharpoons EP \rightleftharpoons ES \rightarrow E + S$ (D) $E + S \rightleftharpoons ES \rightarrow EP \rightarrow E + P$

72. Which metal ion will work as cofactor for the enzyme carboxypeptidase :-
 (A) Mo (B) Zn^{+2}
 (C) Se (D) Fe^{+2}

73. Inhibition of succinic dehydrogenase by malonate is the example of :-
 (A) Non competitive (B) Allosteric inhibition inhibition
 (C) Competitive (D) Negative feed back inhibition

74. $\begin{matrix} X & Y \\ | & | \\ C & - & C \end{matrix} \rightarrow X-Y + C=C$
 the above reaction catalyzed by which class of enzymatic Reaction ?
 (A) Ligases (B) Transferases
 (C) Lyases (D) Hydrolases

75. How many species are documented to be extinct in last 500 years by IUCN Red List, 2004?
 (a) 2,000 (b) 87
 (c) 567 (d) 784

76. The protein structure that gives a 3-D view is :
 (a) α -helix
 (b) Primary structure
 (c) Tertiary structure
 (d) β -pleated sheath

77. Select the correct choice which identifies the chemical bonds (A, B, C) present in the given macromolecules :

Fats = A, Protein = B, Polysaccharide = C

A	B	C
(a) Ester	Peptide	Glycosidic
(b) Ester	Glycosidic	Peptide
(c) Peptide	Glycosidic	Ester
(d) Peptide	Ester	Glycosidic

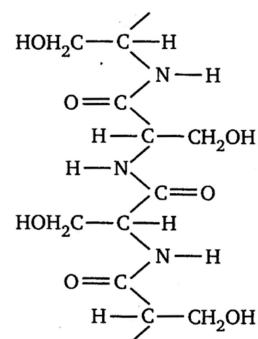
78. Read the given statements and select the correct option.

Statement 1 : Tropical rainforests are disappearing fastly from developing countries such as India.

Statement 2 : No value is attached to these forests because these are poor in biodiversity.

- (a) Both statements 1 and 2 are correct.
 (b) Statement 1 is correct but statement 2 is incorrect.
 (c) Statement 1 is incorrect but statement 2 is correct.
 (d) Both statements 1 and 2 are incorrect

79. Observe a part of polypeptide shown below :



How many H_2O molecules got eliminated to form the above mentioned length of the polypeptide ?

- (a) 4 (b) 3
 (c) 2 (d) 5
80. An exotic species that is introduced to a new area, spreads rapidly and eliminates native species is called
 (a) immigrant species
 (b) invasive species
 (c) destructive species
 (d) none of these

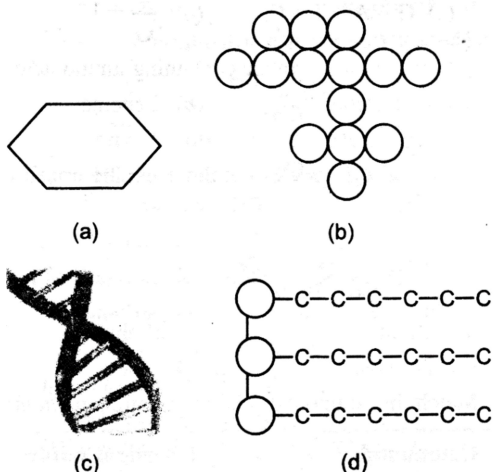
81. Carbohydrates are
 (a) aldehydic and ketonic derivatives
 (b) polyhydroxy compounds
 (c) optically active substances and hydrates of carbon
 (d) all above

82. Which pair of geographical area shows maximum diversity in our country?
 (a) Sunderbans and Rann of Kutch
 (b) Eastern Ghats and Westerns Ghats
 (c) Eastern Himalayas and Western Ghats
 (d) Kerala and Punjab

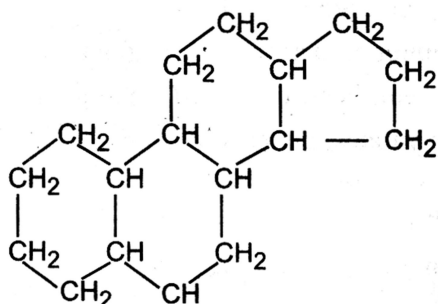
83. In a national park, protection is provided to

- (a) flora and fauna
- (b) entire ecosystem
- (c) fauna only
- (d) flora only

84. Which structure represents a lipid molecule?



85. The given figure is a structure of



- (a) sterol
- (b) carbohydrate
- (c) proteins
- (d) ketones

86. Match column I with column II and select the correct option from the given codes.

- | Column I | Column II |
|--------------------------------|----------------------------|
| A. Rhinoceros | (i) High endemism |
| B. <i>In situ</i> conservation | (ii) Off site conservation |
| C. <i>Ex situ</i> conservation | (iii) On site conservation |
| D. Hotspots | (iv) Kaziranga |
- (a) A – (iv), B – (iii), C – (ii), D – (i)
 (b) A – (iv), B – (i), C – (ii), D – (iii)
 (c) A – (iv), B – (ii), C – (iii), D – (i)
 (d) A – (iv), B – (i), C – (iii), D – (ii)

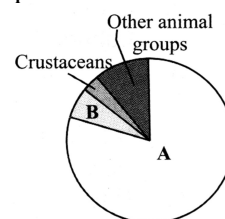
87. Find incorrect difference between purine and pyrimidine?

	Purine	Pyrimidine
(A)	Larger	Smaller
(B)	9 membered ring	6 membered ring
(C)	Nitrogen at position 2,3,7,9	Nitrogen at position 2,3
(D)	Adenine, Guanine	Cytosine, Thymine Uracil

88. Select the incorrectly matched pair.

- (a) UNESCO = United Nations Educational Scientific and Cultural Organisation
- (b) CITES = Convention in International Trade in Elite Species
- (c) IUCN = International Union of Conservation for Nature and Natural Resources
- (d) WWF = World Wide Fund for Nature

89. Given pie diagram represents the proportionate number of species of major groups of invertebrates. Identify the groups A and B.



- (a) A = Insects, B = Molluscs
- (b) A = Molluscs, B = Insects
- (c) A = Insects, B = Annelids
- (d) A = Molluscs, B = Annelids

90. Which of the following statements is not true about RNA?

- (a) Does not have double stranded structure
- (b) Thymine is present
- (c) Does not obey Chargaff's rule
- (d) The sugar contained in RNA is a ribose

ANSWER KEY

1. C	2. C	3. B	4. C
5. C	6. B	7. B	8. B
9. C	10. D	11. D	12. C
13. B	14. D	15. A	16. D
17. C	18. B	19. C	20. B
21. C	22. A	23. D	24. A
25. B	26. D	27. D	28. A
29. A	30. C	31. A	32. A
33. B	34. C	35. C	36. D
37. D	38. C	39. D	40. C
41. C	42. A	43. C	44. A
45. B	46. D	47. B	48. D
49. D	50. B	51. C	52. A
53. D	54. B	55. B	56. B
57. B	58. C	59. D	60. D
61. A	62. B	63. C	64. C
65. C	66. C	67. A	68. C
69. A	70. B	71. fcD	72. B
73. C	74. C	75. D	76. C
77. A	78. B	79. B	80. B
81. D	82. C	83. B	84. D
85. A	86. A	87. C	88. B
89. A	90. B		

