

EXAMINATION CODE : **4**

Dist. Code	Registration No.

QUESTION BOOKLET SL. NO.

489368

QUESTION BOOKLET - PAPER-II

(Read carefully the instructions given in the Question Booklet)

SUBJECTS : CHEMISTRY AND BIOLOGY (BIOLOGICAL SCIENCE)

MAXIMUM MARKS : 100

MAXIMUM TIME : 2 HOURS

SUBJECT CODE : **BS**

(3.00 p.m. to 5.00 p.m.)

(Including initial 10 minutes for filling O.M.R. Answer Sheet)

INSTRUCTIONS TO THE CANDIDATES

1. The sealed Question Booklet containing 100 questions enclosed with O.M.R. Answer Sheet is given to you.
2. Verify whether the given Question Booklet is of the same subject which you have opted. (as in Sl. No. 7 of Admission Ticket)
3. Open the question paper seal carefully and take out the enclosed O.M.R. Answer Sheet outside the Question Booklet and fill up the general information from Sl. No. 1 to 8 of O.M.R. Answer Sheet. If you fail to fill up the details in the form of alphabet and signs as instructed, you will be personally responsible for consequences arising during scoring of your Answer Sheet.
4. Enter the Question Paper Booklet Sl. No. in the O.M.R. Sheet at Sl. No. 4.
5. Enter the code of the subject you opted in the Sl. No. 8 of O.M.R. Sheet.
6. During the examination :-
 - (a) Read each question carefully.
 - (b) Select the correct answer out of the four choices given under each question.
 - (c) Completely darken/shade the relevant oval against Question No. in the O.M.R. Answer Sheet. For example, in a question paper if Sl. No. 3 is correct answer for Question No. 20, then darken before Sl. No. 20 of O.M.R. Answer Sheet using Blue/Black Ball Point Pen as follows :

20. 1 2 3 4 (Only example)

7. Rough work should be done only on the blank space provided in the Question Booklet. Rough work should not be done on the O.M.R. Answer Sheet.
8. If more than one oval is darkened for a given question, such answer is treated as wrong and no mark will be given. See the example in O.M.R. Answer Sheet.
9. The Candidate and the Room Supervisor should sign in the O.M.R. Sheet at specified place. Candidate has to put left hand thumb impression at specified place compulsorily.
10. Each of the candidate is given carbonless O.M.R. Sheet in duplicate. Candidate should return the original O.M.R. Answer Sheet to the Room Supervisor and retain carbon copy of the same with him after the examination.
11. Calculator, pager and mobile phones are not allowed inside the examination hall.
12. If a candidate is found committing malpractice, such a candidate shall not be considered for recruitment and action will be taken against such candidate as per rules.

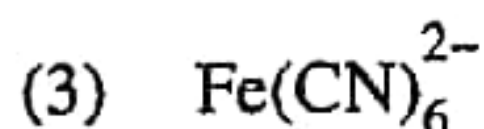
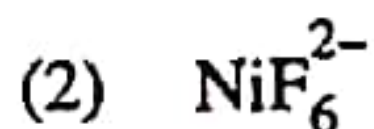
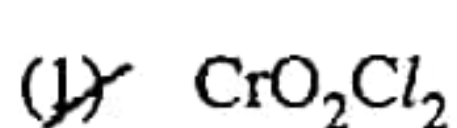
INSTRUCTIONS TO FILL UP THE O.M.R. SHEET

1. There is only one correct answer for each question.
2. All entries in the oval must be made with BLUE or BLACK ball point pen only. Do not try to alter the entry.
3. Oval should be darkened completely so that the numeral inside the oval is not visible.
4. Do not make any stray marks on this sheet.
5. This is a carbonless Answer Sheet. There is no need to shade the second copy separately.

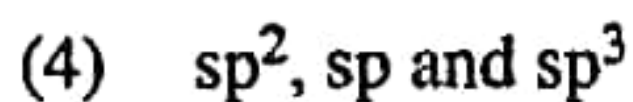
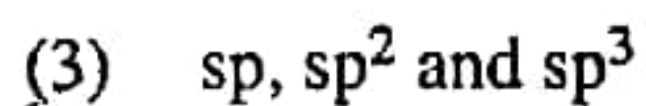
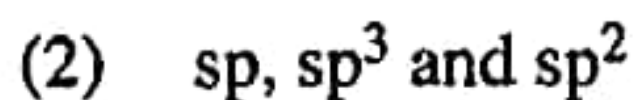
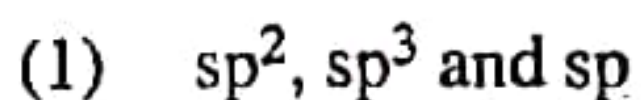
Paper-II BS

ENGLISH VERSION

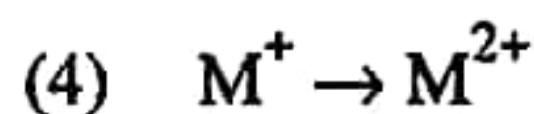
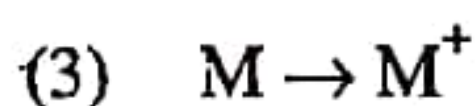
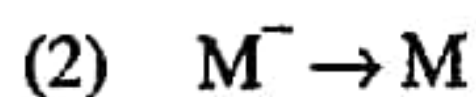
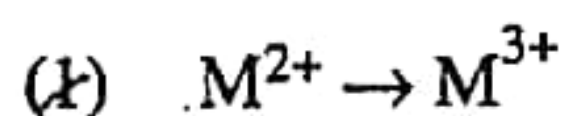
1. Among the following identify the species with an atom in +6 oxidation state :



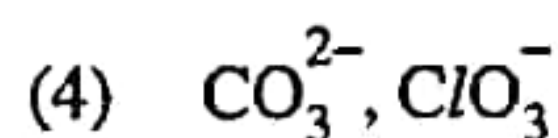
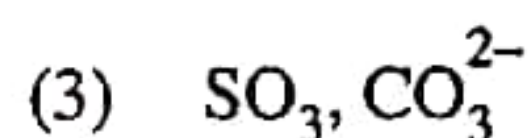
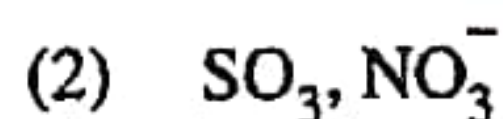
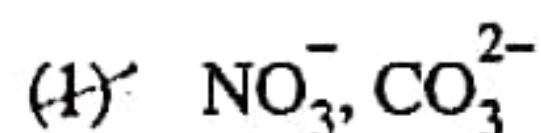
2. The hybridisation of atomic orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ are respectively,



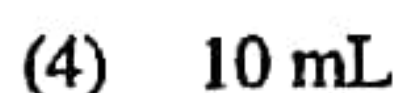
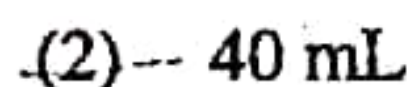
3. Which of the following transition involves the highest energy ? (All processes are in the gaseous state)



4. Which of the following are isoelectronic and isostructural ?



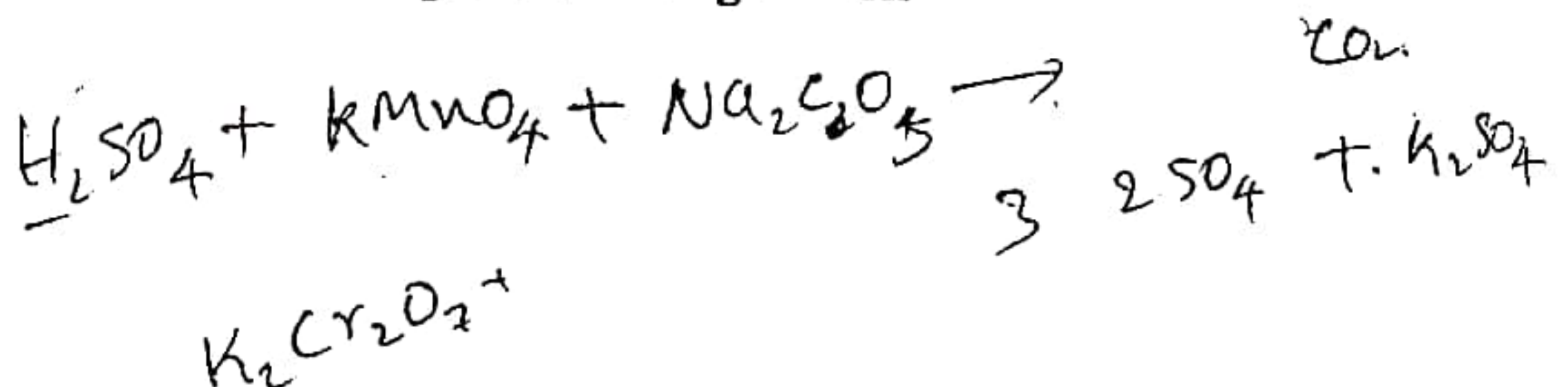
5. An aqueous solution of 6.3 g of oxalic acid dihydrate is made up to 250 mL. The volume of 0.1 N NaOH required to completely neutralise 10 mL of this solution is



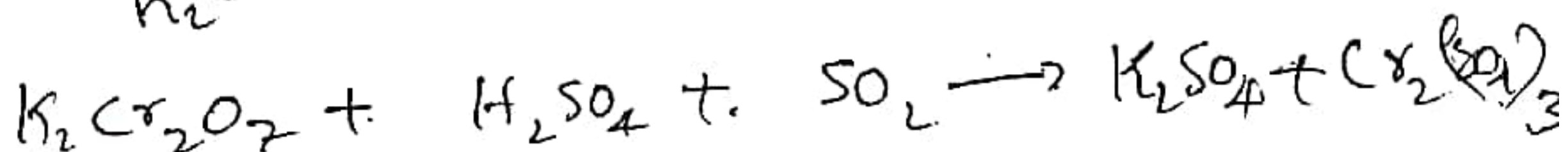
Space For Rough Work

6. Zirconium and hafnium have similar ionic radius because
- (1) both have similar chemical reactivity.
 - (2) of diagonal relationship.
 - (3) of lanthanide contraction.
 - (4) both belong to the same group.
7. If 1L of oxygen at 25 °C and 760 mm pressure contains 'x' molecules, then the number of molecules present in 2L of SO₂ under the same conditions of P and T be
- (1) x/4
 - (2) 4x
 - (3) 2x
 - (4) x/2
8. Two electrons in the same orbital can be distinguished by their
- (1) spin quantum number
 - (2) principal quantum number
 - (3) orbital quantum number
 - (4) magnetic quantum number
9. Which one of the following gives CO₂ with conc. H₂SO₄ and also decolorizes hot, acidified KMnO₄ solution ?
- (1) Na₂C₂O₄
 - (2) NaHCO₃
 - (3) Na₂CO₃
 - (4) CH₃COONa
10. In the chemical reaction,
- $$K_2Cr_2O_7 + X H_2SO_4 + Y SO_2 \longrightarrow K_2SO_4 + Cr_2(SO_4)_3 + Z H_2O,$$
- X, Y and Z are
- (1) 2, 1, 2
 - (2) 1, 3, 1
 - (3) 4, 1, 4
 - (4) 3, 2, 3

Space For Rough Work



Paper-II BS



11. In froth floatation process the sulphide ore particles float because
- (1) their surface cannot be easily wetted by water.
 - (2) they are light
 - (3) they are insoluble
 - (4) they carry an electrostatic charge
12. Benzoic acid can be prepared by reacting phenylmagnesium bromide with
- (1) HCOOEt.
 - (2) HCHO
 - (3) COCl₂
 - (4) CO₂
13. The IUPAC name of [Pt(NH₃)₄Br₂]Cl₂ is
- (1) Dichlorodibromotetrammineplatinate (IV)
 - (2) Dichlorodibromotetrammineplatinum (IV)
 - (3) Dibromotetrammineplatinate (IV) chloride.
 - (4) Tetramminedibromoplatinum (IV) chloride
14. Solvay process can not be used for the manufacture of K₂CO₃, because
- (1) KHCO₃ is not stable in solution
 - (2) ammoniacal KCl will not react with CO₂
 - (3) KCl solution can not be saturated with ammonia
 - (4) KHCO₃ is highly soluble and hence can not be separated

Space For Rough Work

15. The total number of electrons associated with the principal quantum number n is
- (1) $n^2 + 1$ (2) n^2
(3) $2n^2$ (4) $n^2 + 2$
16. The long form of the periodic table is based on the properties of the elements as a function of
- (1) atomic number (2) atomic size
(3) electronegativity (4) atomic mass
17. Which of the following molecules is non-polar ?
- (1) CHCl_3 (2) N_2
(3) H_2O (4) NH_3
18. The lower boiling point of o-nitrophenol when compared to p-nitrophenol is due to the presence of
- (1) inter-molecular hydrogen bonding
(2) resonance
(3) inductive effect
(4) intra-molecular hydrogen bonding
19. Which of the following statements is **not true** with respect to hexamminecobalt(III) chloride ?
- (1) The coordination number of Co is 6.
(2) Cobalt is in +3 oxidation state.
(3) It has three ionizable chloride groups.
(4) Both ammonia and chlorides act as ligands.

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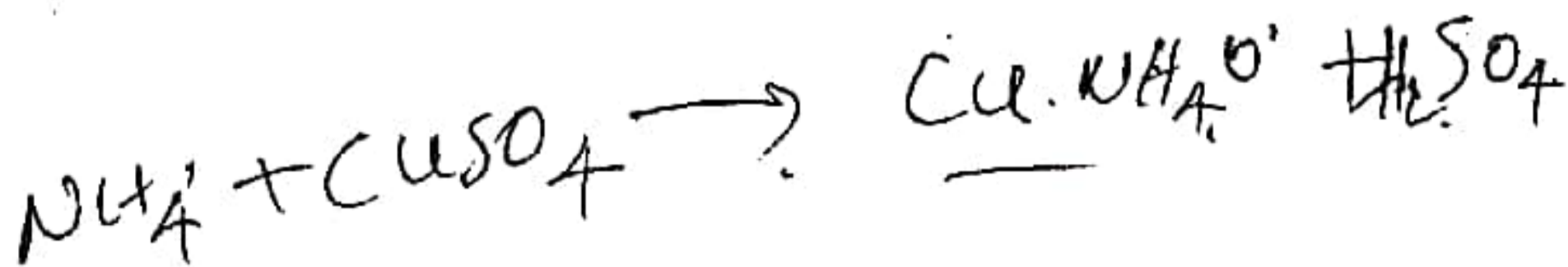
20. The IUPAC name of $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$ is
- (1) ~~3-chloro-1-propene~~ (2) allyl chloride
(3) vinyl chloride (4) 1-chloro-3-propene
21. The indicator used in titrating oxalic acid with sodium hydroxide is
- (1) ferroin (2) methyl red
(3) methyl orange (4) ~~phenolphthalein~~
22. The electron affinities of F, Cl, Br and I are in the order
- (1) $\text{F} > \text{Cl} > \text{Br} > \text{I}$ (2) ~~$\text{Cl} > \text{F} > \text{Br} > \text{I}$~~
(3) $\text{I} > \text{Br} > \text{Cl} > \text{F}$ (4) $\text{F} > \text{Br} > \text{Cl} > \text{I}$
23. Which one of the following esters is obtained by esterification of ethanoic acid with propan-2-ol ?
- (1) $(\text{CH}_3)_2\text{CHCOOCH}_2\text{CH}_3$ (2) $(\text{CH}_3)_2\text{CHCOOCH}_3$
(3) ~~$\text{CH}_3\text{COOCH}(\text{CH}_3)_2$~~ (4) $\text{CH}_3\text{COOCH}_2\text{CH}_3$
24. If 8.0 g of a radioactive isotope has a half-life of 10 hours, the half-life of 2.0 g of the isotope is
- (1) 40 h. (2) 2.5 h.
(3) 5 h. (4) ~~10 h.~~
25. One mole of HCl required 50 g of an impure sample of NaOH to neutralize it exactly. The percentage purity of NaOH is
- (1) 100 (2) 50
(3) 40 (4) ~~80~~

Space For Rough Work

8.0g of radio sub
2.0g

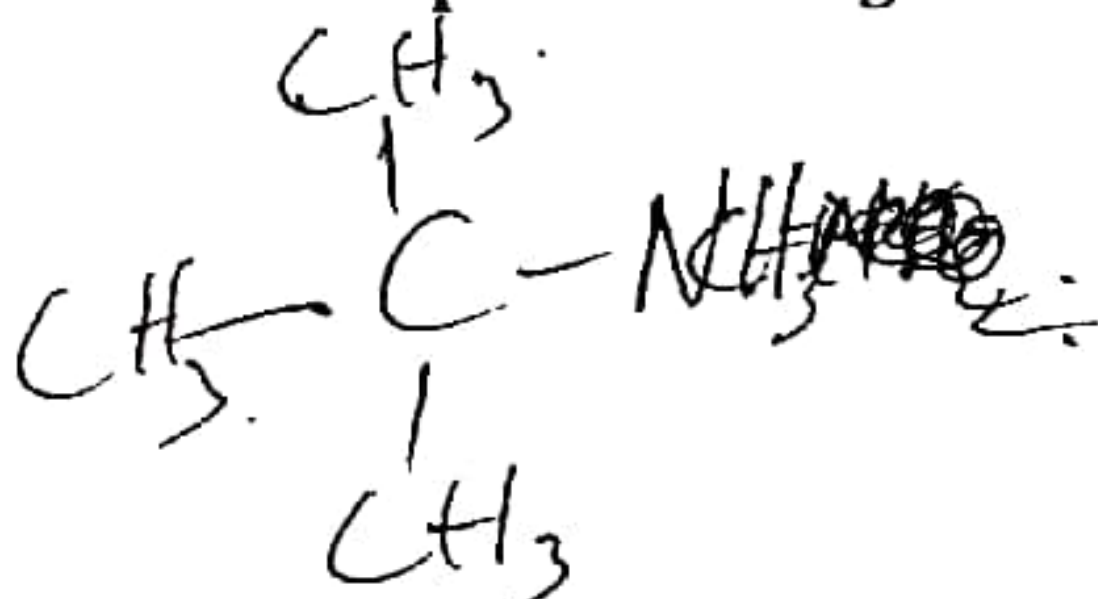
26. Lyophilic sols are more stable than lyophobic sols because, in the former,
- (1) both positively and negatively charged particles are present
 - (2) the colloid particles are positively charged.
 - (3) the colloid particles are negatively charged.
 - (4) the colloid particles are solvated.
27. The deep blue colour generated on adding excess of ammonia to an aqueous solution of copper sulphate is due to the formation of
- (1) $[\text{Cu}(\text{NH}_4\text{OH})_4]^{2+}$
 - (2) $[\text{Cu}(\text{NH}_3)_2]^{2+}$
 - (3) $[\text{Cu}(\text{NH}_3)_4]^{2+}$
 - (4) $[\text{Cu}(\text{NH}_4\text{OH})_2]^{2+}$
28. Identify the statement which is NOT TRUE for lanthanides.
- (1) Their ionic size increases steadily with increase in atomic number.
 - (2) Lanthanides occur together.
 - (3) The most characteristic oxidation state is +3.
 - (4) They can be separated by ion exchange method.
29. Carbon forms a large number of compounds and this is due to
- (1) its non-metallic character.
 - (2) its small size
 - (3) its covalency of 4
 - (4) its unique property of catenation
30. For which of the following pairs the members can be distinguished by iodoform test ?
- (1) $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$ and CH_3OH
 - (2) CH_3OH and $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 - (3) $\text{CH}_3\text{CH}_2\text{OH}$ and $\text{CH}_3\text{CHOHCH}_3$
 - (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ and $\text{CH}_3\text{CHOHCH}_3$

Space For Rough Work



31. Which of the following reagents and conditions convert benzene to chlorobenzene ?
- (1) Cl_2 , HCl and heat (2) Cl_2 , sunlight
 (3) Cl_2 , Fe and heat (4) HCl , sunlight
32. The formation of cyanohydrin from ketone is an example of a
- (1) electrophilic substitution
 (2) electrophilic addition
 (3) nucleophilic addition
 (4) nucleophilic substitution
33. The formula, $(\text{CH}_3)_3\text{C-NH}_2$ represents a
- (1) quaternary ammonium salt
 (2) primary amine
 (3) secondary amine
 (4) tertiary amine
34. The acid which does not contain a $-\text{COOH}$ group is
- (1) formic acid (2) ethanoic acid
 (3) picric acid (4) lactic acid
35. An element with atomic number $Z = 84$ and mass number $A = 218$ loses one alpha particle and two beta-particles successively. The daughter nucleus will have
- (1) $Z = 82$ and $A = 214$.
 (2) $Z = 84$ and $A = 214$.
 (3) $Z = 82$ and $A = 218$.
 (4) $Z = 84$ and $A = 218$.

Space For Rough Work



46. Most favourable conditions for the formation of ionic bonds are
- (1) large cation and small anion
 - (2) small cation and small anion
 - (3) small cation and large anion
 - (4) large cation and large anion
47. The dissociation energy of the O_2^+ is more than that of O_2 molecule. This is because
- (1) O_2^+ has stronger van der Waal's forces.
 - (2) O_2^+ is paramagnetic
 - (3) O_2^+ carries a positive charge.
 - (4) O_2^+ has one electron less in the antibonding orbital.
48. In the electrolysis of a concentrated Brine solution, amount of chlorine gas produced by passage of 2 Faraday of electricity is
- | | |
|-------------|--------------|
| (1) 2 mol | (2) 0.25 mol |
| (3) 0.5 mol | (4) 1 mol |
49. If ${}_3\text{Li}^6$ is transmuted by deuterons, the products formed are
- | | |
|--|---|
| (1) ${}_3\text{Li}^6 + {}_1\text{H}^1$ | (2) ${}_3\text{Li}^7 + {}_2\text{He}^4$ |
| (3) ${}_3\text{Li}^7 + {}_1\text{H}^1$ | (4) ${}_3\text{Li}^7 + {}_0\text{n}^1$ |
50. The enthalpies of combustion of C(graphite) and C(diamond) are -393.5 and -395.3 $\text{kJ}\cdot\text{mol}^{-1}$ respectively. Then the enthalpy change for the reaction $\text{C}(\text{graphite}) \rightarrow \text{C}(\text{diamond})$ is
- | | |
|--|---|
| (1) -788.8 $\text{kJ}\cdot\text{mol}^{-1}$ | (2) -1.80 $\text{kJ}\cdot\text{mol}^{-1}$ |
| (3) 1.80 $\text{kJ}\cdot\text{mol}^{-1}$ | (4) 788.8 $\text{kJ}\cdot\text{mol}^{-1}$ |

Space For Rough Work

51. Which of the following is the causative agent of filariasis ?

- (1) *Taenia saginata*
- (2) *Echinococcus granulosus*
- (3) *Schistostoma mansoni*
- (4) *Wuchereria bancrofti*

52. Leech belongs to the class

- (1) Archiannelida
- (2) Polychaeta
- (3) Hirudinea
- (4) Oligochaeta

53. Amphioxus belongs to the subphylum

- (1) Vertebrata
- (2) Hemichordata
- (3) Urochordata
- (4) Cephalochordata

54. Scientific name of House sparrow is

- (1) *Melophus lathami*
- (2) *Passer domesticus*
- (3) *Petronia xanthocollis*
- (4) *Eberiza melanocephala*

55. Which of the following belongs to order Lepidoptera ?

- (1) Butterfly
- (2) Beetle
- (3) Grasshopper
- (4) Mealy bug

Space For Rough Work

56. Column-I lists the type of vitamin and Column-II lists their associated deficiency diseases. Match the 2 columns and choose the correct answer from those given below :

List-I

- A. Vitamin-A
B. Vitamin-D
C. Vitamin-B₁
D. Vitamin-C

List-II

- p. Rickets
q. Beri-beri
r. Scurvy
s. Dermatitis
t. Nyctalopia

- (1) A = s, B = r, C = t, D = p
(2) A = p, B = t, C = s, D = q
(3) A = r, B = s, C = t, D = q
(4) A = t, B = p, C = q, D = r

57. Read the statement A and B.

Statement A : Enzymes are biocatalysts and are required in small quantities.

Statement B : Enzymes are not substrate specific.

- (1) Statement A is correct, B is wrong.
(2) Both the statements are correct.
(3) Both the statements are wrong.
(4) Statement B is correct, A is wrong.

58. Which of the following is directly affecting the ozone layer ?

- (1) Sulphur dioxide
(2) Chlorofluorocarbon
(3) Nitric oxide
(4) Hydrogen peroxide

Space For Rough Work

59. Sertoli cells could be observed in the cross section of following mammalian organ :
- (1) Spleen (2) Kidney
(3) ~~Testis~~ (4) Lung
60. Follicle Stimulating Hormone (FSH) is produced by
- (1) ~~Pituitary gland~~ (2) Thyroid gland
(3) Pancreas (4) ~~Ovary~~
61. Which of the following is involved with blood clotting ?
- (1) Eosinophil (2) RBC
(3) ~~Platelets~~ (4) Lymphocyte
62. _____ is the complete description of how the organism relates to its physical and biological environment.
- (1) Home range (2) ~~Niche~~
(3) Habitat (4) Territory
63. The first trophic level is represented by
- (1) Decomposers (2) Herbivores
(3) Carnivores (4) ~~Autotrophs~~
64. ABO blood group in humans is an example for
- (1) ~~Multiple alleles~~ (2) ~~Lethal alleles~~
(3) Dominant allele (4) Duplicate genes

Space For Rough Work

Autotrophs
Decomposers

65. Conjugation in bacteria was discovered by
(1) Tatum (2) Jacob
(3) Wollman (4) Lederberg
66. Which of the following is a viral disease ?
(1) Wilt of Potato (2) Red rot of sugarcane
(3) Leaf roll of Potato (4) Wilt of cabbage
67. The cells of *Chara* possess chloroplasts which are
(1) Discoid (2) Cup shaped
(3) Stellate (4) Reticulate
68. Late blight of Potato is caused by
(1) *Puccinia* (2) *Alternaria*
(3) *Phytophthora* (4) *Ustilago*
69. The cells of thallus of *Anthoceros* is peculiar in possessing
(1) Contractile vacuole (2) Two blepharoplasts
(3) Eye spot (4) Pyrenoid
70. Sporocarp is found in
(1) *Selaginella* (2) *Riccia*
(3) *Marsilea* (4) *Rhynia*

Space For Rough Work

71. Corolloid roots are found in

- | | |
|-------------------|-------------------|
| (1) <i>Gnetum</i> | (2) <i>Ginkgo</i> |
| (3) <i>Cycas</i> | (4) <i>Pinus</i> |

72. The ovule is attached to the placenta by a slender stalk which is known as

- | | |
|---------------|--------------|
| (1) Micropyle | (2) Hilum |
| (3) Funicle | (4) Nucellus |

73. If the ovule is curved, becomes horse shoe shaped and the micropyle, chalaza and funicle lie near each other it is called

- | | |
|--------------------|------------------|
| (1) Hemianatropous | (2) Amphitropous |
| (3) Orthotropous | (4) Anatropous |

74. *Jatropha curcas* is a member of the family

- | | |
|-----------------|--------------------|
| (1) Apocynaceae | (2) Euphorbiaceae |
| (3) Malvaceae | (4) Convolvulaceae |

75. From which part of *Atropa belladonna* the drug belladonna is obtained ?

- | | |
|------------|------------|
| (1) Flower | (2) Leaves |
| (3) Root | (4) Stem |

76. SEM stands for

- (1) Scanning Electron Microscopy
- (2) Scintillant Electron Microscopy
- (3) Sensitive Electron Microscopy
- (4) Surface Electron Microscopy

Space For Rough Work

77. The fluid mosaic model of plasma membrane was proposed by
(1) Beadle and Tatum (2) Singer and Nicholson
(3) Robert Brown (4) Watson and Crick
78. Within the cell the site of respiration is the
(1) Nucleolus (2) Golgi bodies
(3) Ribosome (4) Mitochondria
79. The Tunica-Carpus concept was proposed by
(1) Robert Brown (2) Nageli
(3) Schmidt (4) Haberlandt
80. The xylem is exarch in
(1) Petiole (2) Stem
(3) Root (4) Leaf
81. Diffusion of water through selectively permeable membrane is
(1) Autolysis (2) Osmosis
(3) Plasmolysis (4) Diffusion
82. Chlorophyll is a compound that contains
(1) Cobalt (2) Iron
(3) Copper (4) Magnesium

Space For Rough Work

83. The first product of Krebs-cycle is a

- (1) 6-C compound (2) 4-C compound
(3) 3-C compound (4) 5-C compound

84. In *Opuntia* the leaves are modified into

- (1) Phylloclades (2) Scales
(3) Stolons (4) Spines

85. Synthesis of DNA takes place by

- (1) Replication (2) Transduction
(3) Transcription (4) Transformation

86. The repressor protein in Lac operon is a/an

- (1) Tetramer (2) Octomer
(3) Dimer (4) Polymer

87. The cross of F_1 hybrid with its recessive parent is called

- (1) Double cross (2) Back cross
(3) Reverse cross (4) Test cross

88. A Corm is

- (1) The swollen end of an underground stem
(2) A swollen root
(3) A compressed swollen vertical underground stem
(4) Swollen horizontal underground stem

Space For Rough Work

