

EXAMINATION CODE : 04

QUESTION BOOKLET SL. NO.

Dist. Code	Registration No.

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QUESTION BOOKLET - PAPER-II

(Before answering questions read carefully the instructions given in the Question Booklet)

SUBJECTS : CHEMISTRY, BOTANY, ZOOLOGY

MAXIMUM MARKS : 100

MAXIMUM TIME : 2 HOURS

SUBJECT CODE : BS

2.00 p.m. to 4.00 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.
3. Open the question paper seal carefully and take out the enclosed O.M.R. Answer sheet outside the question booklet. Fill up the general information and shade the relevant circle 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. See that the Question Paper Booklet No. and the O.M.R. Answer Sheet No. are same. If there is difference, inform the Room Supervisor immediately.
5. Enter the Question Paper Booklet Sl. No. in the O.M.R. Answer Sheet at Sl. No. 4.
6. Enter the Code of the subject you have opted at Sl. No. 9 of O.M.R. Answer Sheet and shade the circle given before the subject.
7. 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 circle 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 ● ④ (Only example)
8. 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.
9. If more than one circle 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.
10. 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.
11. Each of the candidate is given carbonless O.M.R. Answer 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.
12. Log Tables, Calculator, Pager & Mobile phones are not allowed inside the examination hall.
13. After answering the questions writing the information at Sl. No. 8 is compulsory.
14. Do not use white fluid to change the answer, such answer will not be considered for valuation.
15. **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. Circles must be darkened with **BLUE** or **BLACK** ball point pen only. Do not try to alter the entry.
3. Circle should be darkened completely so that the numeral inside the circle 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

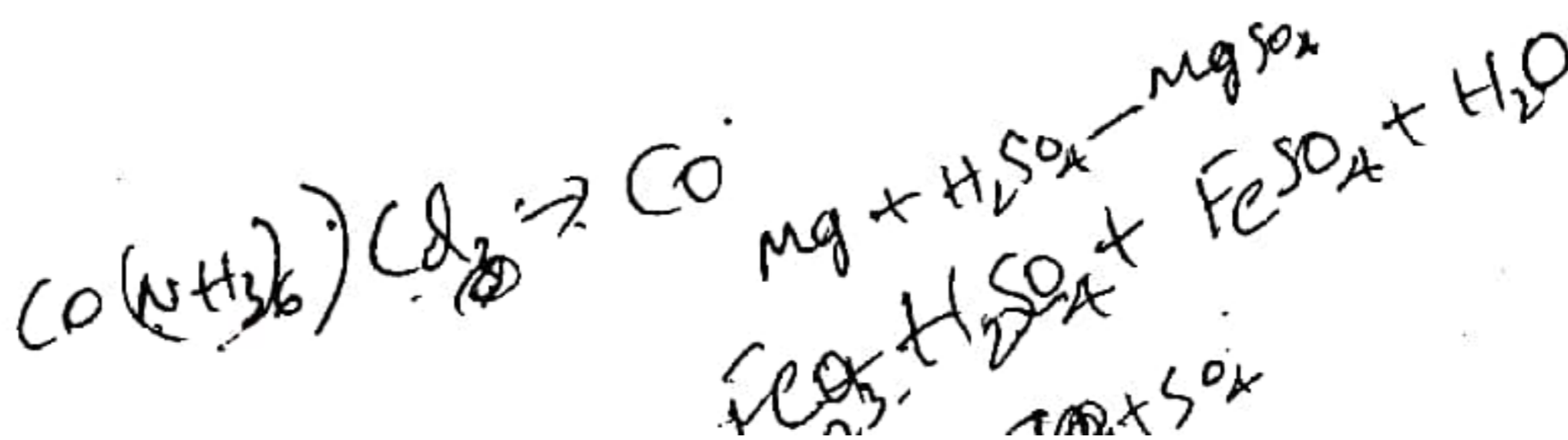
ENGLISH VERSION

1. In Wurtz reaction, ethyl bromide and isopropyl bromide on heating with metallic sodium gives a mixture of _____ alkanes.
- (1) two (2) three
(3) four (4) one
2. In the reaction,
- $$\text{CaC}_2 + \text{H}_2\text{O} \longrightarrow \text{A} \xrightarrow[\text{H}_2\text{SO}_4]{\text{Hg}^{+2}} \text{B}$$
- B is
- (1) Methane (2) Ethyne
(3) Ethanal (4) Aldol
3. Benzene reacts with isobutyl bromide in the presence of AlCl_3 to give
- (1) n-Butyl benzene
(2) Isobutyl benzene
(3) Sec-butyl benzene
(4) tert-Butyl benzene
4. α -D-Glucopyranose reacts with
- (1) Fehling's solution
(2) Grignard reagent
(3) Sodium bisulphate
(4) Schiff's reagent
5. Bond order and bond dissociation energy follow the order :
- (1) $\text{O}_2 > \text{O}_2^- > \text{O}_2^{2-} > \text{O}_2^+$
(2) $\text{O}_2^- > \text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2$
(3) $\text{O}_2^{2-} > \text{O}_2^+ > \text{O}_2 > \text{O}_2^-$
(4) $\text{O}_2^+ > \text{O}_2 > \text{O}_2^- > \text{O}_2^{2-}$
6. Which of the following has smallest de-Broglie wavelength ?
- (1) Molecule of CO_2
(2) Proton
(3) Molecule of SO_2
(4) Electron
7. The energy of an electron in Bohr's second orbit of H atom is $-E$. The energy of the electron in the Bohr's first orbit is
- (1) $4E$ (2) $-4E$
(3) $-E/4$ (4) $-2E$
8. Zr and Hf have almost equal atomic and ionic radii because
- (1) of lanthanide contraction
(2) of actinide contraction
(3) both belong to f-block elements
(4) of diagonal relationship

Space For Rough Work

9. The highest oxidation state exhibited by a transition element is
 (1) +9 (2) +7
 (3) +8 (4) +6
10. The number of moles of KMnO_4 that will be needed to react completely with one mole of ferrous oxalate in acidic solution is
 (1) $\frac{2}{5}$ (2) $\frac{3}{5}$
 (3) 1 (4) $\frac{4}{5}$
11. Which of the following is an acidic oxide?
 (1) Mn_3O_4 (2) MnO
 (3) Mn_2O_3 (4) Mn_2O_7
12. Wilkinson's catalyst used as a homogeneous catalyst in the hydrogenation of alkenes contains
 (1) Rh (2) Al
 (3) Co (4) Fe
13. The number of ions produced from $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ is
 (1) 6 (2) 3
 (3) 4 (4) 2
14. Hypo is used in photography because it is a
 (1) Strong reducing agent
 (2) Strong complexing agent
 (3) Dehydrating agent
 (4) Strong oxidizing agent
15. The formula of corundum is
 (1) SiC (2) SiO_2
 (3) ZnCO_3 (4) Al_2O_3
16. Which of the following will have the largest size?
 (1) Mg^{2+} (2) Al
 (3) Al^{3+} (4) Mg
17. In the separation of ZnS ore and PbS ore _____ is added as depressant.
 (1) NaCN (2) Cresols
 (3) Pine oils (4) Xanthates
18. The metal which does not liberate H_2 from dil. H_2SO_4 is
 (1) Al (2) Fe
 (3) Cu (4) Mg
19. The complex $\text{cis}[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ is used in the treatment of cancer under the name _____
 (1) Zeise's salt (2) Transplatin
 (3) Uracil (4) Cisplatin
20. An example of micelle is
 (1) Gold sol
 (2) Sodium stearate
 (3) Ruby glass
 (4) Solution of NaCl

Space For Rough Work



21. In which of the following, entropy decreases ?

- (1) A liquid crystallizes into a solid
 (2) $\text{H}_{2(g)} \longrightarrow 2\text{H}_{(g)}$
 (3) $2\text{NaHCO}_{3(s)} \longrightarrow \text{Na}_2\text{CO}_{3(s)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(g)}$
 (4) Rusting of iron

22. Match the following :

- (a) Tyndall effect (i) Smoke precipitator
 (b) Electrophoresis (ii) Ultramicroscope
 (c) Coagulation (iii) Medicine
 (d) Adsorption (iv) Sewage water disposal

- | | (a) | (b) | (c) | (d) |
|-----|-------|-------|-------|-------|
| (1) | (iv) | (iii) | (ii) | (i) |
| (2) | (ii) | (i) | (iv) | (iii) |
| (3) | (iii) | (ii) | (i) | (iv) |
| (4) | (i) | (iv) | (iii) | (ii) |

23. At high altitudes, the boiling point of liquid decreases because

- (1) the atmospheric pressure is high.
 (2) the temperature is high.
 (3) the temperature is low.
 (4) the atmospheric pressure is low.

24. A solution of CuSO_4 is electrolyzed for 10 minutes with a current of 1.5 amperes. The mass of copper deposited at the cathode is

- (1) 0.5876 g (2) 0.009794 g
 (3) 0.2938 g (4) 0.004897 g

25. The standard reduction potentials of Cu^{2+}/Cu and $\text{Cu}^{2+}/\text{Cu}^+$ are 0.337 and 0.153 V respectively. The standard electrode potential of Cu^+/Cu half cell is

- (1) 0.521 V (2) 0.827 V
 (3) 0.490 V (4) 0.184 V

26. Saturated solution of KNO_3 is used to make salt bridge because

- (1) KNO_3 is highly soluble in H_2O .
 (2) Velocity of K^+ is greater than that of NO_3^- .
 (3) Velocity of NO_3^- is greater than that of K^+ .
 (4) Velocity of K^+ and NO_3^- are nearly the same.

27. The compound whose aqueous solution has highest pH.

- (1) NH_4Cl
 (2) NaCl
 (3) Na_2CO_3
 (4) $\text{CH}_3\text{COONH}_4$

Space For Rough Work

28. The solubility products of AgCl and AgI are 1.1×10^{-10} and 1.6×10^{-16} respectively. If AgNO_3 is added drop by drop to the solution containing equal concentration of both chloride and iodide ions, the salt precipitated first is
- (1) AgI
 - (2) Both AgCl and AgI
 - (3) AgNO_3
 - (4) AgCl
29. The heat of neutralization of HCl by NaOH is -55.9 kJ/mole. If the heat of neutralization of HCN by NaOH is -12.1 kJ/mole, the energy of dissociation in HCN is
- (1) 43.8 kJ (2) 68 kJ
 - (3) -43.8 kJ (4) -68 kJ
30. According to Langmuir adsorption isotherm the amount of gas adsorbed at very high pressure
- (1) goes on increasing with pressure
 - (2) reaches a constant limiting value
 - (3) increases first and decreases later with pressure
 - (4) goes on decreasing with pressure
31. In a spontaneous change, a system undergoes
- (1) increase in internal energy.
 - (2) lowering the free energy.
 - (3) no energy change.
 - (4) lowering of entropy.
32. The new neutron and proton ratio after a nuclide, ${}_{92}\text{U}^{238}$ loses an α -particle is
- (1) 144/90 (2) 234/90
 - (3) 239/90 (4) 146/92
33. Which of the following is considered as a synthetic element ?
- (1) Lead (2) Plutonium
 - (3) Uranium (4) Thorium
34. The equipment used to carry out the fission reaction in a controlled manner is called
- (1) Nuclear fusion
 - (2) Thermonuclear fission
 - (3) Nuclear reactor
 - (4) Moderator

Space For Rough Work

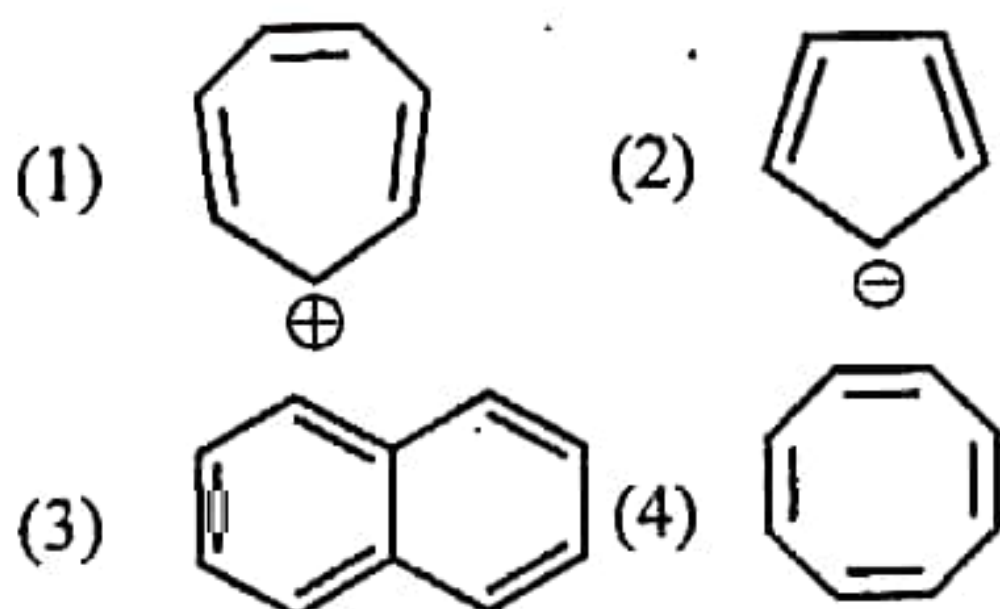
35. The IUPAC name of $\text{CH}_3\text{COCH}_2\text{CHO}$ is

- (1) 4-Formylbut-2-one
- (2) 3-Oxobutanal
- (3) 1-Formylbut-3-one
- (4) 3-Oxobutanol

36. $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ and $\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$ are

- (1) Metamers
- (2) Chain isomers
- (3) Tautomers
- (4) Functional isomers

37. Which of the following does not obey Huckel rule ?



38. Propene is separated from propyne by using the reagent

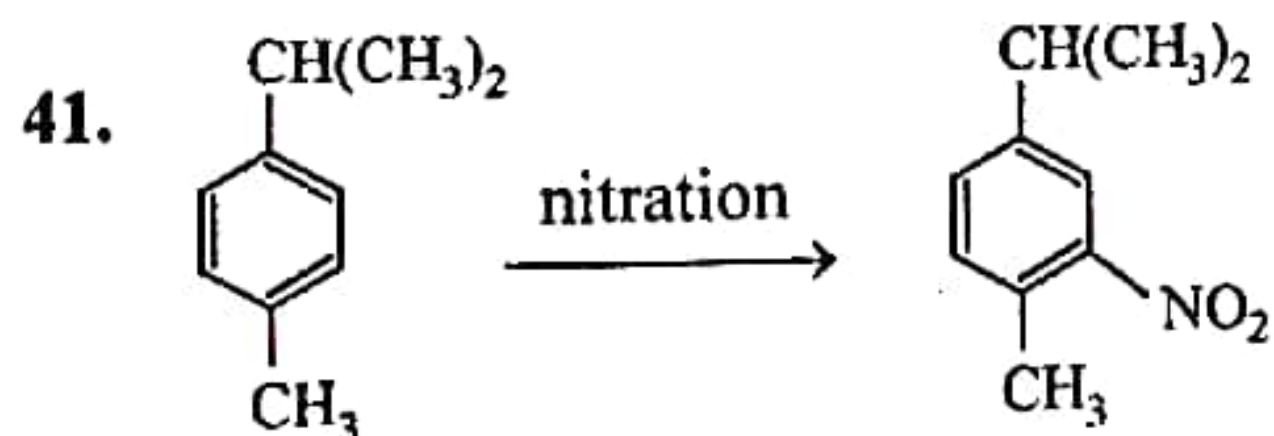
- (1) Alkali KMnO_4
- (2) Br_2 water
- (3) Ammonical AgNO_3
- (4) Schiff's reagent

39. IUPAC name of $\text{CH} \equiv \text{C} - \text{CH} = \text{CH} - \text{CH} = \text{CH}_2$

- (1) Hexa-3, 5-diene-1-yne
- (2) Penta-1, 3-dien-5-yne
- (3) Penta-3, 5-diene-1-yne
- (4) Hexa-1, 3-dien-5-yne

40. The decreasing order of their relative reactivity with an electrophile of the following compounds is :

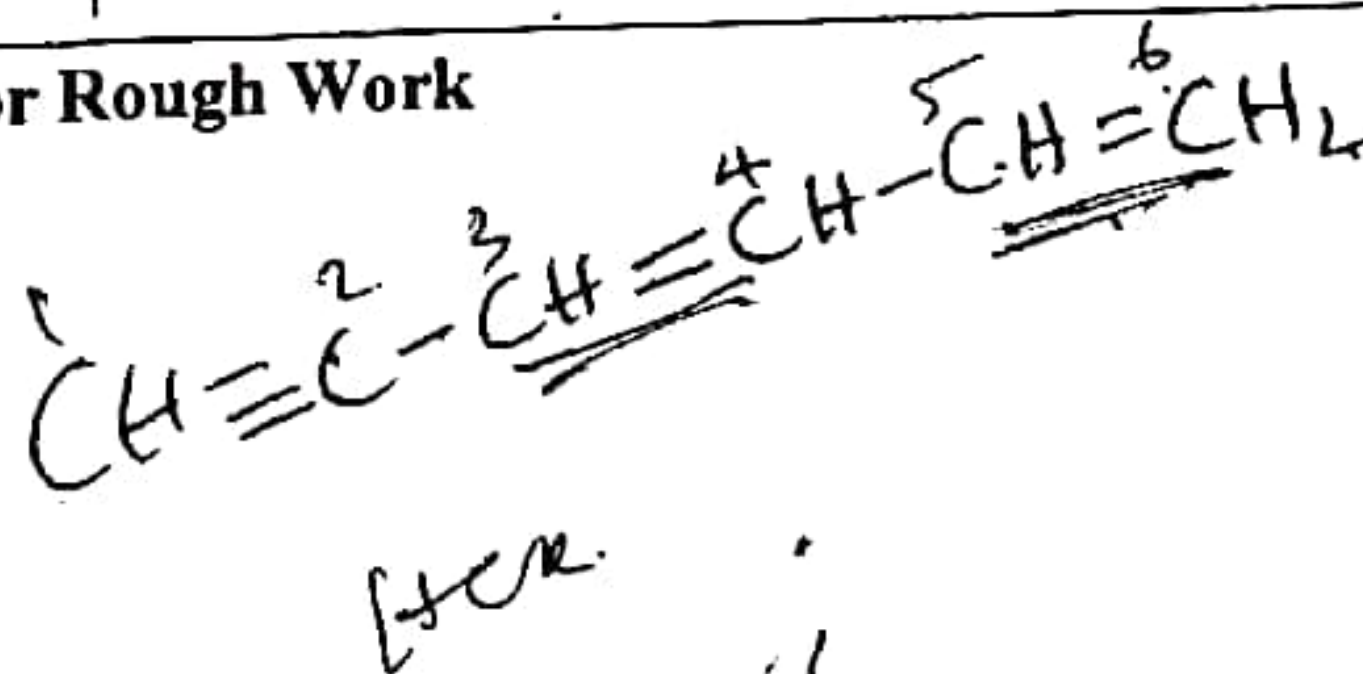
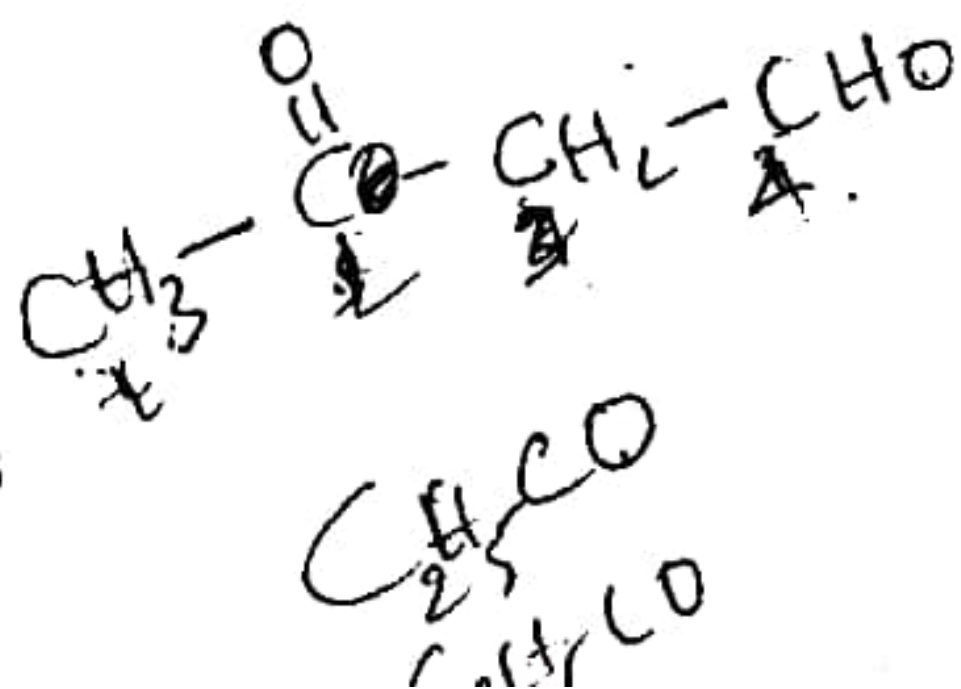
- (i) Toluene
 - (ii) p-Xylene
 - (iii) p-Nitro toluene
 - (iv) p-Dinitrobenzene
- (1) (ii) > (i) > (iii) > (iv)
 - (2) (ii) > (iii) > (iv) > (i)
 - (3) (iii) > (iv) > (i) > (ii)
 - (4) (i) > (ii) > (iii) > (iv)



This can be explained on the basis of

- (1) Inductive effect
- (2) Resonance
- (3) Hyperconjugation
- (4) Electromeric effect

Space For Rough Work



42. Which of the following compounds will show *cis-trans* isomerism ?
- (1) $(\text{CH}_3)_2\text{C} = \text{CHCH}_3$
 - (2) $\text{CH}_2 = \text{CCl}_2$
 - (3) $(\text{CH}_3)_2\text{C} = \text{C}(\text{CH}_3)_2$
 - (4) $\text{CH}_3 - \text{CH} = \text{C} - \text{Br}(\text{CH}_3)$
43. The incorrect statement is
- (1) Ribose is an aldopentose
 - (2) Maltose is a ketohexose
 - (3) Fructose is a ketohexose
 - (4) Galactose is an aldohexose
44. Which of the following is a communicable disease ?
- (1) Scurvy
 - (2) Typhoid
 - (3) Beriberi
 - (4) Rickets
45. Which of the following is not a plant hormone ?
- (1) Equilenin
 - (2) Gibberellins
 - (3) Cytokinins
 - (4) Auxins
46. The alkaloid which is used as agent for the relief of pain is
- (1) Quinine
 - (2) Atropine
 - (3) Morphine
 - (4) Nicotine
47. Which of the following is having weakest C-H bond ?
- (1) Ethene
 - (2) Ethane
 - (3) Benzene
 - (4) Ethyne
48. Only two isomeric monochloro derivatives are possible for
- (1) 2-Methylpropene
 - (2) Benzene
 - (3) n-Hexane
 - (4) 2, 4-Dimethylpentane
49. Which of the following is not a test for carbohydrates ?
- (1) Molish test
 - (2) Biuret test
 - (3) Seliwanoff's test
 - (4) Tollen's test
50. Kolbe's electrolysis of potassium succinate gives CO_2 and _____.
- (1) Ethane
 - (2) Ethyne
 - (3) Ethene
 - (4) Ethanoic acid

Space For Rough Work

51. In C_4 plants the CO_2 acceptor is
- (1) Pyruvate
 - (2) Posphoenol pyruvate
 - (3) Aspartate
 - (4) Malate
52. Respiration is an
- (1) Endothermic process
 - (2) Anabolic process
 - (3) None of these
 - (4) Exothermic process
53. The pigment that absorbs red and far-red light in plants is _____.
- (1) Xnathophyll
 - (2) Phytochrome
 - (3) Carotene
 - (4) Cytochrome
54. The plants growing on saline soils are called as _____.
- (1) Xerophytes
 - (2) Halophytes
 - (3) Hydrophytes
 - (4) Oxylophytes
55. The formation of m-RNA from DNA is called
- (1) Transformation
 - (2) Transduction
 - (3) Transcription
 - (4) Translation
56. Law of independent assortment can be explained with the help of _____.
- (1) Dihybrid cross
 - (2) Back cross
 - (3) Test cross
 - (4) Monohybrid cross
57. When chromosome sets are present in multiple of 'n' the condition is called as _____.
- (1) Aneuploidy
 - (2) Euploidy
 - (3) Diploidy
 - (4) Polyploidy
58. The main components of plasma membrane are
- (1) Lipids, proteins and carbohydrates
 - (2) Lipids only
 - (3) Proteins only
 - (4) Lipids and proteins
59. Chromatids exchange segments at _____.
- (1) Zygotene
 - (2) Diakinesis
 - (3) Leptotene
 - (4) Pachytene

60. Plasmids are ideal vectors for gene cloning as
- (1) They can be multiplied in the laboratory using enzymes
 - (2) They can replicate freely outside the bacterial cell
 - (3) They are self replicating within the bacterial cell
 - (4) They can be multiplied by culturing
61. Which one of the following technique is not associated with DNA fingerprinting ?
- (1) Gel electrophoresis
 - (2) Southern blotting
 - (3) Identification of genes
 - (4) Autoradiography
62. Read the statements A and B :
- Statement A** : A virus may contain both RNA and DNA.
- Statement B** : Viruses can infect only animals.
- Which of these is correct ?
- (1) Both statements are incorrect.
 - (2) Statement A is correct and B is incorrect.
 - (3) Statement A is incorrect and B is correct.
 - (4) Both statements are correct.
63. Which one of the following algae has the ability to fix the atmospheric nitrogen ?
- (1) *Nostoc*
 - (2) *Spirogyra*
 - (3) *Oedogonium*
 - (4) *Ulothrix*
64. Brain fever (Japanese Encephalitis) is caused by
- (1) Cauliflower mosaic virus
 - (2) Musa virus
 - (3) Arbovirus
 - (4) Lyssavirus
65. Downy mildew of 'Jowar' is caused by
- (1) *Sclerospora sorghii*
 - (2) *Sphacelotheca sorghii*
 - (3) *Sclerospora graminicola*
 - (4) *Erysiphe graminis-tritici*
66. Chemical compounds produced by host plants as defense reaction to pathogen are called
- (1) Phytoalexins
 - (2) Phytotoxins
 - (3) Phytohormones
 - (4) Phytochromes

67. Which one of the following are called 'Amphibians of Plants Kingdom' ?
- (1) Pteridophytes
 - (2) Fungi
 - (3) Algae
 - (4) Bryophytes
68. A fern is a
- (1) Non-vascular non-flowering plant
 - (2) Vascular flowering plant
 - (3) Non-vascular flowering plant
 - (4) Vascular non-flowering plant
69. Pinus seed have
- (1) Two cotyledons
 - (2) Three cotyledons
 - (3) Many cotyledons
 - (4) Single cotyledon
70. Pneumatophores are characteristics of the family
- (1) Orchidaceae
 - (2) Loranthaceae
 - (3) Leguminosae
 - (4) Rhizophoraceae
71. An orthotropous ovule is one in which the microphyle and chalaza are
- (1) at right angle to the funiculus
 - (2) oblique with respect to the funiculus
 - (3) parallel to the funiculus
 - (4) in a straight line with the funiculus
72. Natural system of classification is proposed by _____.
- (1) John Hutchninson
 - (2) Bentham and Hooker
 - (3) Oswald Tippo
 - (4) Carolus Linnaeus
73. Capitulum inflorescence is found in
- (1) Fabaceae
 - (2) Asteraceae
 - (3) Solanaceae
 - (4) Malvaceae
74. Coir fibers are obtained from which part of the coconut ?
- (1) Mesocarp
 - (2) Endocarp
 - (3) Seed coat
 - (4) Epicarp
75. Meristematic tissues of plants include
- (1) Stem and root tips, vascular cambium and cork cambium
 - (2) Tips of stem, tips of mature leaves and cork cambium
 - (3) Tips of mature leaves and vascular cambium
 - (4) Vascular cambium, cork cambium and the tips of mature leaves

76. Chrysalis is the pupal stage of
 (1) Wasp (2) Honey bee
 (3) Butterfly (4) Moth
77. Which of the following is an insect hormone?
 (1) Ecdysone
 (2) Thyroxine
 (3) Testosterone
 (4) FSH
78. Column - I lists the cell organelles and Column - II lists their function. Match the two columns and choose the correct answer from those given below :
- | Column - I | Column - II |
|--------------------------|---------------------------------|
| A. Mitochondria | p. Protein synthesis |
| B. Ribosome | q. Synthesis of energy molecule |
| C. Golgi complex | r. Cellular digestion |
| D. Endoplasmic reticulum | s. Secretion |
| | t. Transport |
- (1) A = t, B = p, C = q, D = r
 (2) A = q, B = p, C = s, D = t
 (3) A = r, B = p, C = q, D = t
 (4) A = p, B = q, C = s, D = t
79. Which of the following is used to make antibiotic penicillin?
 (1) *Penicillium chrysogenum*
 (2) *Penicillium digitatum*
 (3) *Penicillium candidum*
 (4) *Penicillium marneffeii*

80. Read the statements A and B and choose the correct answer from below :
Statement A : Mitochondria are present in prokaryotes.
Statement B : Nuclear envelope is absent in prokaryotes.
 (1) Both the statements are wrong.
 (2) Statement A is correct, B is wrong.
 (3) Statement B is correct, A is wrong.
 (4) Both the statements are correct.
81. Which of the following belongs to the order Gynophiona?
 (1) Salamanders
 (2) Newts
 (3) Toads
 (4) Caecilians
82. What is the common name of *Naja naja*?
 (1) Krait (2) Indian cobra
 (3) Viper (4) Coral snake
83. Which of the following is the highest fish producing State in India?
 (1) Karnataka (2) Tamil Nadu
 (3) West Bengal (4) Gujarat
84. Which of the following organism is used extensively for composting the waste organic compounds?
 (1) Earthworm (2) Bacteria
 (3) Fungi (4) Algae
85. Which of the following is a non-green house gas?
 (1) Methane
 (2) Carbon monoxide
 (3) Nitrous oxide
 (4) Carbon dioxide

86. *Euglena viridis* belongs to the class
 (1) Rhizopodea
 (2) Mastigophora
 (3) Telosporea
 (4) Zoomastigophora
87. To which phylum Sponges belong ?
 (1) Mollusca (2) Annelida
 (3) Porifera (4) Coelenterata
88. Mode of nutrition in amoeba is
 (1) Holophytic (2) Saprozoic
 (3) Mixotrophic (4) Holozoic
89. The term annelida was introduced by
 (1) Lamarck (2) Darwin
 (3) Linnaeus (4) Cuvier
90. To which order beetles belong to ?
 (1) Orthoptera
 (2) Hemiptera
 (3) Coleoptera
 (4) Lepidoptera
91. Cumulus oophorus is found in
 (1) Birds (2) Fishes
 (3) Frogs (4) Mammals
92. Edaphic factors are concerned with
 (1) Water
 (2) Temperature
 (3) Soil
 (4) Air
93. Minamata disease was caused due to the water pollution by
 (1) Arsenic nitrate
 (2) Methyl mercury
 (3) Cadmium chloride
 (4) Lead acetate
94. Which of the following mammal has pouch for holding the premature young ones ?
 (1) Primates (2) Dermoptera
 (3) Chiroptera (4) Marsupialia
95. From which of the following mitotic spindle is formed ?
 (1) Microfilament
 (2) Actin filament
 (3) Myosin filament
 (4) Microtubule
96. Who first introduced the vaccination method ?
 (1) Louis Pasteur
 (2) Karl Landsteiner
 (3) Oswald Avery
 (4) Edward Jenner
97. Turtles belong to the order
 (1) Lacertilia (2) Crocodilia
 (3) Chelonian (4) Ophidia
98. A thick glandular pouch lying just above cloacae present in many birds is called
 (1) Bursicon
 (2) Bursa Entiana
 (3) Bursa of Fabricius
 (4) Canal of Schlemm
99. To which of the following group Barbet belongs to ?
 (1) Mammals (2) Aves
 (3) Reptiles (4) Amphibia
100. Cats belong to the family
 (1) Bovidae (2) Suidae
 (3) Muridae (4) Felidae