

Name..... Roll no.....

Biological Group

Tribhuvan University
Institute of science and Technology
B.Sc. Entrance Examination
2074

Full marks : 100

Time : 2 hrs

Answer all questions

Group A (Zoology)

1. The father of zoology is
 - a) Robert Hooke
 - b) Aristotle
 - c) Linnaeus
 - d) Theophrastus
2. The study of insects is called
 - a) Entomology
 - b) Parasitology
 - c) Mycology
 - d) Taxonomy
3. Which group has radial symmetrical body
 - a) Protozoa
 - b) Echinodermata
 - c) Annelida
 - d) Mollusca
4. Haemocoelom is present in
 - a) Arthropoda
 - b) Annelida
 - c) Fish
 - d) Amphibia
5. Water Vascular system is present in
 - a) Pori fera
 - b) Coelenterata
 - c) Echinodermata
 - d) Arthropoda
6. Operculum is used to cover
 - a) Eye
 - b) Gill
 - c) Mouth
 - d) Ear
7. Which one of the following is an insect
 - a) Spider
 - b) Scorpion
 - c) Prawn
 - d) Grasshopper
8. Which one is a true fish
 - a) Cuttle fish
 - b) Star fish
 - c) Dog fish
 - d) Silver fish
9. Which nucleus has role in conjugation in Paramecium
 - a) Mega nucleus
 - b) Micronucleus
 - c) Macronucleus
 - d) Cellular nucleus

10. Which Segment has setae present in earthworm
- a) 1st c) Clitellar
b) Last d) 10th
11. Male genital aperture is situated in
- a) 14th segment c) 18th segment
b) 10th segment d) 17th segment
12. The function of spermatheca in earthworm is to
- a) Store sperms c) Store enzyme
b) Store ova d) Store zygote
13. The causative agent of Tuberculosis is
- a) Leishmania c) Mycobacterium
b) Salmonella d) Taenia
14. Which of the following is a non-communicable disease
- a) TB c) AIDS
b) Kalazar d) Cancer
15. The air-borne disease is
- a) Typhoid c) Filaria
b) TB d) Cancer
16. Which season, frogs usually go for aestivation
- a) Summer c) Rainy
b) Winter d) Autumn
17. The artery which supply the blood to liver is
- a) Renal c) Coronary
b) Hepatic d) Gastric
18. The testis of frog is attached with peritoneum. This Structure is called
- a) Mesovarian c) Nephron
b) Retroperitoneal d) Mesorchium
19. Which one of the following is a vestigial organ
- a) Fore limb c) Appendix
b) Hind Limb d) Liver
20. Miller and Urey expt. is designed for verification
- a) Darwin theory c) Lamarck theory
b) Oparin's theory d) Redi theory

21. Theory of "Inheritance of Acquired characters" was proposed by
- | | |
|-----------|------------------|
| a) Darwin | c) Hugo de-Vries |
| b) Lamark | d) Huxley |
22. Striped muscle is different from unstriped on the basis of
- | | |
|---------------|-------------------------|
| a) Nuclei | c) Shape |
| b) Myofibrils | d) Dark and light bands |
23. Nephrons are found in
- | | |
|-----------|-----------|
| a) kidney | c) Testis |
| b) Liver | d) Ovary |
24. Which stage of embryo, blastocoels present
- | | |
|-------------|-------------|
| a) Neurula | c) Blastula |
| b) Gastrula | d) Morula |
25. Which one is the hormone released from Adrenal gland
- | | |
|-------------|------------------------|
| a) Glucagon | c) Mineralocorticoides |
| b) Insulin | d) GSH |
26. The enzyme trypsin is released from
- | | |
|--------------|-------------|
| a) Stomach | c) Liver |
| b) Intestine | d) Pancreas |
27. Which of the following is not a covering of brain in human
- | | |
|---------------|--------------|
| a) Duramater | c) Piamater |
| b) Epithelium | d) Arachnoid |
28. The cavity found pelvic girdle of mammal is
- | | |
|-------------------|----------------------|
| a) Acetabulum | c) Obturator foramen |
| b) Glenoid cavity | d) Sigmoid notch |
29. Fishes migrate within the ocean is
- | | |
|------------------|-----------------|
| a) Potamodromous | c) Catadromous |
| b) Amphidromous | d) Ocenodromous |
30. Wall lizard moves on wall due to
- | | |
|--------------------|---------|
| a) Vacuum creation | c) Leg |
| b) Tail | d) Nail |
31. In vitro fertilization is used for
- | | |
|------------------------------------|-------------------------------|
| a) Detection of disorder of foetus | c) Women unable to give birth |
| b) Giving birth to the baby | d) Detection of cancer |

32. Which of following is a wildlife reserve
- | | |
|-----------------|--------------|
| a) Koshi Tappu | c) Shivapuri |
| b) Makalu-Barun | d) Khapted |
33. Which is an example of reflex action
- | | |
|-----------------|-------------|
| a) Vision | c) Movement |
| b) Eye-blinking | d) Reading |

Group B (Chemistry)

34. One mole of CO₂ contains
- | | |
|-------------------------------------|--|
| a) 6.02×10^{23} atoms of C | c) 18.1×10^{23} molecule of CO ₂ |
| b) 6.02×10^{23} atoms of O | d) 3g atoms of CO ₂ |
35. Real gases will approach the behaviour of ideal gas at:
- | | |
|------------------|-------------------|
| a) low T, low P | c) high T, high P |
| b) low T, high P | d) high T, low P |
36. The electronic configuration of silver atom in ground state is:
- | | |
|--|--|
| a) [Ar] 3d ¹⁰ 4s ¹ | c) [Kr] 4d ¹⁰ 5s ¹ |
| b) [Xe] 4f ¹⁴ 5d ⁰ 6s ¹ | d) [Kr] 4d ⁹ 5s ² |
37. Which of the following has the lowest melting point ?
- | | |
|---------|---------|
| a) LiCl | c) KCl |
| b) NaCl | d) RbCl |
38. Which of the following bond is non-polar ?
- | | |
|----------|----------|
| a) N - H | c) F - F |
| b) C - H | d) O - H |
39. The direction of a chemical reaction is the direction of decrease of :
- | | |
|-----------------------|-------------|
| a) Gibb's free energy | c) Enthalpy |
| b) Entropy | d) None |
40. The PH of the gastric juice is
- | | |
|--------------------|------------------|
| a) slightly acidic | b) highly acidic |
| a) slightly basic | c) neutral |
41. An oxidising agent is capable of:
- | | |
|------------------------|---------------------|
| a) giving electrons | c) producing anion |
| b) accepting electrons | d) producing cation |
42. The role of a catalyst in a chemical reaction is to change:
- | | |
|-------------------------|-------------------------|
| a) enthalpy of reaction | c) activation energy |
| b) nature of products | d) equilibrium constant |

43. Ozone decolorises vegetable matter due to its:
 a) oxidizing action
 b) reducing action
 c) hydrolytic action
 d) unsaturated nature
44. The strongest acid amongst the following is:
 a) HF
 b) HCl
 c) HBr
 d) HI
45. The noble gas element which is used as cryogenic fluid is:
 a) He
 b) Ne
 c) Ar
 d) Kr
46. Which of the following is the weakest base?
 a) $Mg(OH)_2$
 b) $Ca(OH)_2$
 c) NaOH
 d) KOH
47. German silver is an alloy of:
 a) Copper
 b) Lead
 c) Zinc
 d) Silver
48. The number of isomers of C_6H_{14} is
 e) 4
 f) 5
 g) 6
 h) 7
49. Marsh gas mainly contains:
 a) C_2H_2
 b) CH_4
 c) H_2S
 d) CO
50. Baeyer's reagent is
 a) alkaline permanganate solution
 b) acidified permanganate solution
 c) neutral permanganate solution
 d) aqueous bromine solution
51. In the nitration of benzene with a mixture of conc. HNO_3 and conc. H_2SO_4 the active species involved is:
 a) nitrite ion
 b) nitrate ion
 c) nitronium ion
 d) nitrogen peroxide
52. In Lassaigne's test, when both N & S are present, a blood red colour is obtained. This is due to the formation of :
 a) ferric ferrocyanide
 b) ferric cyanide
 c) ferric thiocyanate
 d) ferric hydroxide
53. Which of the following is not a glyceride? :
 a) Fat
 b) Oil
 c) Phospholipid
 d) Soaps

54. Substances which bring the body temperature down are known as:
 a) antipyretics
 b) analgesics
 c) antibiotics
 d) none
55. ${}_{92}^{238}\text{U}$ emits an α particle, the mass number and atomic number of the product formed are,
 a) 236, 92
 b) 234, 90
 c) 238, 90
 d) 236, 90
56. Green vitriol is:
 a) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
 b) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
 c) $\text{NiSO}_4 \cdot 6\text{H}_2\text{O}$
 d) $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$
57. Which of the following is a dihydric alcohol ?
 a) Glycol
 b) Glycerol
 c) Glycine
 d) Citric acid
58. Phenol is more acidic than
 a) acetic acid
 b) ethyl alcohol
 c) p-nitrophenol
 d) p-methoxyphenol
59. Salicylic acid is an aromatic compound containing:
 a) one-OH group
 b) one-COOH group
 c) one-COOH group and one-OH group
 d) two COOH group
60. Methylamine is:
 a) slightly acidic
 b) less basic than NH_3
 c) more basic than NH_3
 d) neutral
61. Carbylamines reaction is used to test:
 a) 1° amines
 b) 2° amines
 c) 3° amines
 d) none
62. Which of the following types of compounds forms zwitter ion :
 a) α - amino acids
 b) carbohydrate
 c) nucleic acids
 d) lipids
63. Variable valency is exhibited by:
 a) transition metals
 b) non-metals
 c) alkali metals
 d) alkaline earth metals
64. Main contributor of the green house effect is:
 a) NO_2
 b) SO_2
 c) CO_2
 d) OF_2

65. Which of the following pairs of ions cannot be separated by H_2S in dil HCl ?
- | | |
|--|--|
| a) Bi^{3+} , Sn^{2+} | c) Fe^{3+} , Hg^{2+} |
| b) Cu^{2+} , Co^{2+} | d) Zn^{2+} , Ni^{2+} |
66. If 250 ml of 0.25 M NaCl solution is diluted with water to a volume of 500ml, the new concentration of the solution is:
- | | |
|------------|-------------|
| a) 0.167 M | c) 0.0833 M |
| b) 0.125 M | d) 0.0167 M |
67. The primary cells are:
- | | |
|-----------------|---------------------|
| a) rechargeable | c) not rechargeable |
| b) ever lasting | d) none |

Group C (Botany)

68. Plant cells usually differ from animal cells in the absence of
- | | |
|-----------------|---------------|
| a) Mitochondria | c) Centrioles |
| b) ER | d) Ribosomes |
69. Viruses are essentially made of
- | | |
|-------------------------------|--------------------------------|
| a) Proteins and nucleic acids | c) Lipids and nucleic acids |
| b) Proteins and carbohydrates | d) Starch, proteins and lipids |
70. Difference between Gram +ve and Gram -ve bacteria is in their
- | | |
|------------------|-----------------|
| a) Cell membrane | c) Ribosome |
| b) Cell wall | d) Mitochondria |
71. Sexual reproduction in Chlorophyceae occurs by
- | | |
|--------------|--------------|
| a) Isogamy | c) Oogamy |
| b) Anisogamy | d) All above |
72. Fungi can be stained by
- | | |
|----------------|----------------|
| a) Cotton blue | c) Lactophenol |
| b) Safranin | d) Glycerine |
73. The most common group of Algae in lichen is
- | | |
|---------------------|----------------|
| a) Green algae | c) Red algae |
| b) Blue-green algae | d) Brown algae |
74. In *Marchantia*, female sex organs are produced in stalked structures called
- | | |
|-------------------|--------------------|
| a) Gynophore | c) Carpel |
| b) Megasporophyll | d) Archegoniophore |

75. Prothallus of fern produces
- | | |
|------------|-----------------------|
| a) Gametes | c) Gametes and spores |
| b) Spores | d) None of above |
76. Female cone of Pinus is
- | | |
|------------------|--------------------|
| a) Flower | c) Megasporophyll |
| b) Inflorescence | d) Microsporophyll |
77. Ginger is a stem and not a root because
- | | |
|--------------------------|--------------------------------|
| a) It stores food | c) It has nodes and internodes |
| b) It is bitter in taste | d) It is non-green in colour |
78. Collenchyma differs from parenchyma in having
- | | |
|----------------------|-------------------------------|
| a) Living protoplasm | c) Cellulose walls |
| b) Vacuoles | d) Pectin deposits at corners |
79. Mycorrhizal root is
- | | |
|---------------------------------------|---|
| a) A kind of root with fungal disease | c) Association of fungus with the root of higher plants |
| b) A kind of fungal root | d) A kind of undeveloped root |
80. A bulb is modification of
- | | |
|---------|----------|
| a) Root | c) Leaf |
| b) Stem | d) Fruit |
81. What is edible in guava ?
- | | |
|-------------|---------------|
| a) Pericarp | c) Cotyledons |
| b) Thalamus | d) Perianth |
82. Compound leaf
- | | |
|--------------------------------|---|
| a) Never bears an axillary bud | c) Always arise in the axil of other leaf |
| b) Never bears terminal bud | d) Has an entire lamina |
83. Which of the following name is correctly written ?
- | | |
|-----------------------------|----------------------------|
| a) <i>Ficus Bengalensis</i> | c) <i>Rosa indica</i> |
| b) <i>Apis indica</i> | d) <i>Mangifera indica</i> |
84. Hypogynous flower refers to having
- | | |
|-------------------|--------------------------------------|
| a) Ovary superior | c) Ovary half inferior half superior |
| b) Ovary inferior | d) Ovary absent |

85. ATP formation during photosynthesis is
- Phosphorylation
 - Photophosphorylation
 - Oxidative phosphorylation
 - None of these
86. The number of ATP molecules synthesized in glycolysis of aerobic respiration is
- 2
 - 8
 - 30
 - 6
87. The maximum water loss during transpiration is from
- Lenticels
 - Cuticle
 - Stomata
 - Hydathodes
88. Dry seeds when placed in water swells up due to
- Imbibitions
 - Absorption
 - Diffusion
 - Adsorption
89. Movement in the leaf of *Mimosa pudica* occurs due to turgor changes in
- Pulvinus and pulvinules
 - Pinna and pinnules
 - Leaf and leaflets
 - Petiole and rachis
90. Which of the following induces cell division ?
- Cytokinins
 - Auxins
 - Gibberellins
 - Abscisic acid
91. The oxygen in photosynthesis is released from
- CO₂
 - H₂O
 - Both CO₂ and H₂O
 - Chlorophyll
92. Pyruvic acid is formed at the end of
- Calvin cycle
 - krebs cycle
 - Glycolysis
 - Pentose phosphate pathway
93. Transfer of information from DNA to mRNA is called
- Transcription
 - Transduction
 - Translation
 - Amination
94. Gentic code is
- Singlet
 - Doublet
 - Triplet
 - None of above

95. TMV contains genetic material
- a) Chromosomes
 - b) DNA
 - c) RNA
 - d) All of above
96. The factors that represent the contrasting pairs of characters are called
- a) Dominant and recessive
 - b) Alleles
 - c) Homologous pairs
 - d) Determinants
97. When frog eats grasshopper which thrives on green plants, the frog is
- a) Primary producer
 - b) Herbivore
 - c) Primary carnivore
 - d) Top consumer
98. 5th June is celebrated as
- a) World Population Day
 - b) World AIDS Day
 - c) World Environment Day
 - d) World Hygiene Day
99. Vegetative production of new plants
- a) Quick production of new plants
 - b) Combining good qualities of two varieties
 - c) Both a) and b)
 - d) None
100. Anemophily is pollination carried out by
- a) Animal
 - b) Wind
 - c) Water
 - d) Insect

The End