

BIOLOGICAL SCIENCE

Full Marks : 100

Time : 2 hours

Read the following instructions carefully.

1. This question paper contains all objective questions.
2. Questions must be answered on Objective Response Sheet (**ORS**) by darkening the appropriate bubble (marked A, B, C, D) against the question number on the respective right hand columns. Each question has only one correct / best answer.
3. All ORS will be processed by electronic means. Hence, invalidation of Answer Sheet due to folding or putting stray marks on it or any damage to the Answer Sheet as well as incomplete / incorrect filling of the Answer Sheet will be the sole responsibility of the candidate.
4. Incorrect answers will carry **NEGATIVE** marks. 1/4 mark will be deducted for each wrong answer.
5. Answers without any response will be awarded zero mark. Wrong response or more than one response will be treated as incorrect answer and negative marks will be awarded for the same.
6. Write your roll number, name & question booklet number at the specified locations of the ORS.
7. Use only Black/Blue Ball Point Pen to mark the answers by complete filling up of the respective bubbles.
8. Mobile phones, Calculators, Slide Rules, Log Tables and Electronic Watches with facilities of Calculator, Charts, Graph sheets or any other form of Tables are **NOT** allowed in the examination hall. Possession of such devices during the examinations may lead to cancellation of the paper besides seizing of the same.
9. Mark the answers only in the space provided. Please do not make any stray mark on the ORS.
10. Rough work can be done on the question paper itself. Additional blank pages are given at the end of the question paper for rough work.
11. This question paper contains 28 printed pages including pages for rough work. Please check all pages and report, if there is any discrepancy.
12. Please hand over the ORS to the Invigilator before leaving the Examination Hall.

BIOLOGICAL SCIENCES

(English Version)

Each question carries 1 mark

Full Marks : 100

1. A metabolic pathway having anabolic & catabolic role is called
(A) Amphibolic pathway (B) Cyclic pathway
(C) Redundant pathway (D) None of the above
2. Which animal is the symbol of WWF ?
(A) Tiger (B) Horn bill
(C) Giant Panda (D) Lion
3. Accessory excretory human organs are
(A) Skin and intestine (B) Skin and liver
(C) Skin and lungs (D) Skin, liver, lungs and intestine
4. Which of the following plant processes is not carried out by auxin ?
(A) Phototropism (B) Geotropism
(C) Fruit ripening (D) Stomatal movement
5. Sundarban is a
(A) sanctuary (B) biosphere reserve
(C) zoo (D) national park
6. Surgical removal of both the kidneys would result in death because :
(A) urea will not be excreted
(B) water will accumulate in blood
(C) glucose will be lost from the body
(D) immune response will be suppressed
7. Name a synthetic plant hormone which is used as herbicide.
(A) 2, 4-D (B) Kinetin
(C) Zeatin (D) Brassinosteriod

8. Which one is a viral disease ?
- (A) Tetanus (B) Typhoid
(C) Dysentery (D) None of the above
9. Chief function of loop of Henle is
- (A) absorption of water (B) absorption of glucose
(C) absorption of Na^+ (D) Secretion of K^+
10. Which muscle contraction may be spontaneous ?
- (A) Cardiac muscle (B) Skeletal muscle
(C) Intestinal smooth muscle (D) Either (A) or (C)
11. Which phytohormone is adenine derivative :
- (A) Cytokinin (B) Gibberellin
(C) Auxin (D) Ethylene
12. Some fruits show a characteristic respiratory rise in response to ethylene. Such fruits are
- (A) Non climacteric fruits (B) Climacteric fruits
(C) Inducive fruits (D) Non-inducive fruits
13. Dengue fever is transmitted by
- (A) *Aedes aegypti* (B) *Culex fatigans*
(C) *Anopheles sp* (D) *Aedes donovani*
14. Vaccine is
- (A) Live oral pathogen (B) Inactivated antigen
(C) Inactivated pathogen (D) Complete pathogen
15. Vivipary is inhibited by which plant hormone ?
- (A) Absciscic acid (B) Gibberellin
(C) Auxin (D) Ethylene
16. The requirement of cold temperature for flowering is known as
- (A) Photoperiodism (B) Vernalization
(C) Phytostabilization (D) Phytoremediation

17. Kidney stones are made of
- (A) oxalate crystals (B) calcium carbonate
(C) cholesterol esters (D) calcium bilirubinate
18. The muscle contraction for a shortest duration is found in
- (A) jaws (B) heart
(C) eyelids (D) intestine
19. Which one of the following is used to join DNA ?
- (A) Ligase (B) Primase
(C) DNA polymerase (D) Endonuclease
20. Chordata without jaw
- (A) Gnathostomata (B) Agnatha
(C) Apoda (D) Mandibulata
21. Two forms of phytochrome are
- (A) Pr & Pfr (B) Chromophore & apoprotein
(C) Phytochromobilin & Pr (D) Pfr & p
22. Dual day length plants require which condition for flowering ?
- (A) Two long days (B) Both short & long days
(C) Two short days (D) None of the above
23. Which of the following is Ca^{2+} binding protein ?
- (A) Synaptotagmin (B) Troponin
(C) Calmodulin (D) All of the above
24. The process of skeletal muscle relaxation is
- (A) active (B) passive
(C) either (A) or (B) (D) both (A) and (B)
25. In an epigynous flower the ovary is
- (A) Superior (B) Inferior
(C) Half superior (D) Half inferior

26. Male gametes of which plant group are exclusively non-motile ?
- (A) Gymnosperms (B) Bryophyta
(C) Pteridophyta (D) Angiosperms
27. Which one is a plasmid ?
- (A) Bam HI (B) EcoRI
(C) pBR 322 (D) Sal I
28. Who discovered the 'super bug'?
- (A) Ananda Mohan Chakraborty (B) H. G. Khurana
(C) Robert Hooke (D) J. C. Bose
29. The spinal nerves of human are
- (A) pure sensory (B) pure motor
(C) both sensory and motor (D) some sensory and some motor
30. Which of the following is known as the 'sensory relay centre'?
- (A) Cerebral cortex (B) Thalamus
(C) Hypothalamus (D) Brainstem
31. Gir sanctuary is mainly for
- (A) Rhino (B) Tiger
(C) Lion (D) Elephant
32. The largest endangered bird in India is
- (A) Vulture (B) Flamingo
(C) Great Indian bustard (D) Great Indian hornbill
33. The white matter of the central nervous system looks white because of the richness in
- (A) myelinated axons (B) unmyelinated axons
(C) cell bodies and dendrites (D) both (A) and (C)
34. Which of the following is not a water soluble second messenger in hormone action ?
- (A) Cyclic AMP (B) Cyclic GMP
(C) Inositol triphosphate (D) Diacylglycerol

35. Which one of the following was not explained by Darwin ?
- (A) Natural selection (B) Struggle for existence
(C) Mutation (D) Origin of species
36. Hormone receptors are present in
- (A) Plasma membrane (B) Cytoplasm
(C) endoplasmic reticulum (D) either (A) or (B)
37. The ploidy level of the primary endosperm nucleus is generally
- (A) Haploid (B) Diploid
(C) Triploid (D) Polyploid
38. Anemophilous species of flowering plants produce
- (A) Excess amount of pollen grains (B) Sticky pollen grains
(C) Pollinia (D) Filamentous pollen grains
39. Down syndrome is an example of
- (A) aneuploidy (B) polyteny
(C) polyploidy (D) triploidy
40. Rats deficient in thyroid hormones cannot survive in
- (A) hot (B) humid
(C) cold (D) both (A) and (C)
41. The production of fruits without fertilization is known as
- (A) Apomixis (B) Apogamy
(C) Parthenocarp (D) Amphimixis
42. Proteins that seal damaged sieve elements by plugging the sieve element pores are called
- (A) S. Proteins (B) Ph Proteins
(C) P Protein's (D) None of the above
43. Which hormone cannot raise the blood glucose level ?
- (A) Cortisol (B) Glucagon
(C) Insulin (D) Thyroxine

44. First cloned sheep is :
- (A) Molley (B) Polly
(C) Dolly (D) Jolly
45. First genetically engineered plant commercially released in India
- (A) Bt Brinjal (B) Bt Cotton
(C) Golden rice (D) Tomato
46. Gametes are formed in animals from
- (A) epithelial tissue (B) connective tissue
(C) muscular tissue (D) nervous tissue
47. Which can identify SO_2 pollution in environment ?
- (A) Grasses (B) Mosses
(C) Lichens (D) Climbers
48. Pancreatic zymogens are activated in
- (A) small intestine (B) pancreas
(C) large intestine (D) both (A) and (B)
49. Which structure has the smallest diameter ?
- (A) Left bronchus (B) Right bronchus
(C) Secondary bronchiole (D) Respiratory bronchiole
50. The occurrence or development of 2 or more embryos in a single seed is known as
- (A) Pluriembryony (B) Anagenesis
(C) Stasigenesis (D) Polyembryony
51. Golden rice is a GM crop & it is rich in
- (A) Carotene (B) Riboflavine
(C) Niacin (D) Biotin
52. The products of double fertilization
- (A) 2 Zygotes (B) Zygote & primary endosperm nucleus
(C) Endosperm cells (D) Gametes

53. Diaphragm in the resting state is
(A) Oblique (B) Flat
(C) Dome shaped (D) None of these
54. Organelles are absent in
(A) Type I alveolar cells (B) Type II alveolar cells
(C) Both of these cells (D) None of these cells
55. The Prokaryotic algal group is known as
(A) Blue-green algae (B) Cyanobacteria
(C) Cyanochloronta (D) All the above
56. Incomplete dominance is shown by
(A) Primrose (B) *Mirabilis*
(C) China rose (D) Rose
57. Oxygen carried by human blood is liberated in
(A) heart (B) arteries
(C) capillaries of body (D) capillaries of lungs
58. Inspiratory centre is located in
(A) midbrain (B) cerebellum
(C) medulla (D) hypothalamus
59. When the gaseous exchange across the human lungs gets reduced the condition is known as
(A) tuberculosis (B) emphysema
(C) carcinoma (D) pneumonia
60. In a dorsiventral leaf the mesophyll is
(A) not differentiated into veins
(B) differentiated into palisade & spongy parenchyma
(C) not with air chambers
(D) none of the above
61. Stethoscope can be used to measure
(A) respiratory rate (B) heart rate
(C) both of the above (D) none of the above

62. The remnants of nucellar tissue in a seed
- (A) Endosperm (B) Perisperm
(C) Histogen (D) Antipodal
63. All members of which plant group show exclusively thallose plant body ?
- (A) Pteridophyta (B) Gymnosperms
(C) Angiosperms (D) Bryophyta
64. Which organ can store blood ?
- (A) Heart (B) Spleen
(C) Liver (D) Kidney
65. In which CO_2 fixation pathway 2 carboxylating enzyme participate ?
- (A) C_3 cycle (B) C_4 cycle
(C) C_2 cycle (D) None of the above
66. Which hormone has intrinsic enzyme activity ?
- (A) ADH (B) Cortisol
(C) Renin (D) Prolactin
67. Evaginations of the mucous membrane called rugae are found in
- (A) small intestine (B) stomach
(C) oesophagus (D) large intestine
68. In leucopenia
- (A) leucocytes decrease below 5000
(B) leucocytes increase above 6000
(C) bone marrow is destroyed
(D) lymphocytes decrease from 2% to 0.5%
69. The reaction centres of PS I & PS II are
- (A) P650 & P600 (B) P700 & P600
(C) P790 & P550 (D) P700 & P680
70. A radially symmetrical flower is termed as
- (A) Zygomorphic flower (B) Actinomorphic flower
(C) Asymmetrical flower (D) Epigynous flower

71. Which of the following cell elements of xylem is living ?
(A) Tracheid (B) Trachea
(C) Libriform fibre (D) Xylem parenchyma
72. Secretion of acrosome
(A) hyaluronic acid (B) hyaluronidase
(C) fertilizin (D) FSH
73. Silent valley is tropical evergreen forest located in
(A) Kerala (B) Karnataka
(C) West Bengal (D) Orissa
74. Which ion has the highest concentration in blood plasma ?
(A) Na^+ (B) K^+
(C) Ca^{2+} (D) Mg^{2+}
75. Sudden and heritable change in a character is called
(A) mutation (B) recombination
(C) genetic drift (D) selection
76. Scientific name of king cobra
(A) *Vipera russelli* (B) *Naja naja*
(C) *Naja hannah* (D) *Bungarus coeruleus*
77. Name of a limbless amphibia
(A) *Rana* (B) *Bufo*
(C) *Ichthyophis* (D) *Rhacophorus*
78. Which of the following is not a meristematic tissue ?
(A) Cambium (B) Phellogen
(C) Collenchyma (D) Calyptrogen
79. Botanic gardens are primarily concerned with the
(A) *ex situ* conservation of biodiversity
(B) *in situ* conservation of biodiversity
(C) Conservation of economically important plants
(D) None of the above.

80. Sperms attain maturity in
- (A) epididymis (B) prostate gland
(C) seminal vesicle (D) vas deferens
81. Initiation codon in eukaryotes
- (A) AUG (B) UUU
(C) UAA (D) UAG
82. All living organisms are grouped into 3 domains : Archaea, Bacteria & Eucarya. Among these which domain(s) is/are prokaryotic ?
- (A) Archaea & Eucarya (B) Bacteria & Eucarya
(C) Eucarya (D) Archaea & Bacteria
83. Both helical & icosahedral capsids are constructed from many copies of one or few types of protein subunits called
- (A) Nucleocapsids (B) Protomers
(C) Hexamers (D) Pentons
84. Each lichen thallus is consisting of 2 different organisms with symbiotic association. These organisms are called
- (A) Photobiont & saprobiont (B) Mycobiont & symbiont
(C) Photobiont & mycobiont (D) Prototroph & auxotroph
85. Name the enzyme that catalyzes the following glycolytic reaction
 $\text{phosphoenol Pyruvate} + \text{ADP} \rightarrow \text{Pyruvate} + \text{ATP}$
- (A) Phosphoribulo Kinase (B) Phosphofructo Kinase
(C) Pyruvate Kinase (D) Phosphoglycerate Kinase
86. Root nodules contain an oxygen-binding haeme protein called
- (A) Nodulin (B) Leghaemoglobin
(C) Nod protein (D) Bacteroid
87. Who proposed operon concept
- (A) Allec Jaffery (B) David Baltimore
(C) Jacob and Monod (D) Lederberg

88. Plasma membrane is fluid structure due to presence of
- (A) Carbohydrate (B) Lipid
(C) Glycoprotein (D) Polysaccharide
89. Cellulose, the major constituent of the plant cell wall, is made up of
- (A) Linear chains of β 1 \rightarrow 4 linked glucans
(B) Branched xyloglucans
(C) Arabinoxylans
(D) Glucomannans
90. Which one is bacteriostatic drug
- (A) Penicillin (B) Tetracyclin
(C) Streptomycin (D) Ciprofloxacin
91. RNA showing catalytic property is called
- (A) Allozyme (B) Ribozyme
(C) Proenzyme (D) Isozyme
92. Leydig's cells are present in
- (A) liver (B) ovary
(C) seminiferous tubule (D) spleen
93. Why the C_4 pathway of CO_2 assimilation is more efficient than the C_3 pathway ?
- (A) Photorespiratory loss is absent or minimum
(B) Two carboxylating enzymes are involved
(C) PEP case shows very high CO_2 affinity.
(D) Due to all the above mentioned reasons
94. Source of energy in an ecosystem
- (A) Sun (B) ATP
(C) Sugar (D) Green plant
95. Trophic level in ecosystem is formed by
- (A) only bacteria (B) only plants
(C) only herbivores (D) organisms linked in food chain

96. In case of lysogeny the genome of the temperate phage is integrated into the host bacterial chromosome. The integrated phage genome is called
- (A) Prophage (B) Latent phage
(C) Virulent phage (D) Macrophage
97. Kaziranga is famous for
- (A) Wild ass (B) Elephant
(C) Buffallow (D) Rhinoceros
98. Sex chromosomes of a female bird are represented by
- (A) XO (B) XX
(C) XY (D) ZW
99. The binomial nomenclature was consistently used by Carolus Linnaeus in which book ?
- (A) Systema Naturae (1735) (B) Critica Botanica (1737)
(C) Genera Plantarum (1737) (D) Species Plantarum (1753)
100. The transition zone between two communities is known as
- (A) ecotone (B) edge effect
(C) keystone species (D) edge species

BIOLOGICAL SCIENCES

(Bengali Version)

Each question carries 1 mark

Full Marks : 100

1. একটি বিপাকক্রিয়া যেটি উপচিতি এবং অপচিতি-মূলক উভয়ই
- (A) অ্যাম্ফিবোলিক পাথওয়ে (B) চক্রাকার পাথওয়ে
(C) রিডানডান্ট পাথওয়ে (D) উপরিউল্লেখিত কোনটিই নয়
2. WWF-এর সংকেত হিসাবে কোন প্রাণীকে ধরা হয় ?
- (A) বাঘ (B) হনবিল
(C) জায়ান্ট পান্ডা (D) সিংহ