

## Biology

Q1. Multiple choice questions:

- (1) Members of the same species living in the same time make a (Habitat, Biosphere, Community, ☒ Population) (2) In a scientist studying the methods of inserting human insulin gene in bacteria, which branch of biology may this be (Anatomy, Physiology, ☒ Biotechnology, Pharmacology) (3) Which of these major bioelements is in the highest percentage in protoplasm (Carbon, Hydrogen, ☒ Oxygen, Nitrogen) (4) Which of the following group includes organisms all of which are absorptive in their nutrition (Protists, Animals, Bacteria, ☒ Fungi) (5) Similar cells organized into groups and performing same functions, are known as (Organelle, ☒ Tissue, Organ, Organ system) (6) Which of these tissues also make the glandular tissue in animals (☒ Epithelial tissue, Muscular tissue, Connective tissue, Nervous tissue) (7) The level of organization that is less definite in plants is (Tissue level, organ level, ☒ organ system level, individual level) (8) What are true about volvox (Unicellular prokaryote, unicellular eukaryote, ☒ Colonial eukaryote, Multicellular eukaryote) (9) When we study the feeding relations among different animal species of a forest, at what level of organization we are studying (Individual, population, ☒ Community, Biosphere) (10) Which one of these is not a characteristic of a hypothesis (must be consistent with all available data, must be testable, ☒ must be correct, must make predictions) (11) At which point is a biologist must likely to use reasoning (While taking observations, ☒ during hypothesis formulation, during data organization, none) (12) A gardener sees a large snake nearby. He knows that generally snakes sting, so the gardener ran away. The gardener did which of the following (☒ used reasoning, used observation, constructed a theory, tested a hypothesis) (13) Classification means the grouping of organisms on the basis of (How they feed, ☒ the features they have in common, how they respire, how they can survive) (14) Viruses are not classified in any kingdom because (They are too poorly understood, they are too small, their genetics cannot be determined, ☒ they are not considered organisms) (15) Viruses are assigned to the kingdom



(Monera, Protista, Fungi, ✓None) (16) A related group of genera comprises (An order, ✓A family, A class, A phylum) (17) In which kingdom would you classify unicellular eukaryotes (Fungi and plantae, Fungi and Monera, ✓Only Protista, only Fungi) (18) In binomial nomenclature, the first letter of the — name is capitalized (Family, Class, Species, ✓Genus) (19) Which of the following may be the correct way of writing the scientific name of an organism (✓Canis lupus, Saccharum, Grant's gazelle, E. Coli) (20) A certain organism is multicellular, adapted for photosynthesis, and has multicellular sex organs. To which kingdom does it belong (Animals, Fungi, ✓Plantae, Protista) (21) Species that are in the same — are more closely related than (Phylum — class, Family — Order, Class — Order, ✓Family — genus) (22) When the last member of a particular species dies, the species is said to be — (Established, ✓Extinct, Threatened, Endangered) (23) In which season Houbara bustard migrates to Pakistan and settles here (Summer, Spring, Autumn, ✓Winter) (24) There are — micrometer ( $\mu\text{m}$ ) in one millimeter (mm), (10, 100, ✓1000,  $\frac{1}{1000}$ ) (25) Which of these materials is not a component of the Plasma membrane (Lipids, Carbohydrates, Proteins, ✓DNA) (26) Cells walls are found in these organisms, except for —, which all lack cell walls (Plants, ✓Animals, Bacteria, Fungi) (27) The — is a major component of plant cell walls (Chitin, Peptidoglycan, ✓Cellulose, Cholesterol) (28) Plant cells have — and — which are not present in animal cells (Mitochondria/Chloroplasts, cell membranes/cell walls, Chloroplasts/nucleus, ✓chloroplasts/cell wall) (29) The — is membrane enclosed structure in eukaryotic cells that contains the DNA of the cell (Mitochondrion, Chloroplast, Nucleolus, ✓Nucleus) (30) Ribosomes are constructed in the — (Endoplasmic reticulum, Nucleoid, ✓Nucleolus, Nuclear pore) (31) Rough endoplasmic reticulum is the area in a cell where — are synthesized (Polysaccharides, Proteins, ✓Lipids, DNA) (32) The mitochondrion functions in — (Lipid storage, Protein synthesis, Photosynthesis, ✓Cellular respiration) (33) The thin extensions of the inner mitochondria membrane are known as (✓Cristae, Matrix

Thylakoids, Stroma) (34) The chloroplast functions in (ATP synthesis, Protein synthesis, ✓Photosynthesis, Cellular respiration) (35) Which of these cellular organelles have their own DNA (Chloroplast, Nucleus, Mitochondria, ✓All of these) (36) In which stage of the cell cycle each chromosome is duplicated and so it consists of two chromatids. (G1, ✓S, M, G2) (37) If you observe a cell like this one, what phase of mitosis is it? (✓Anaphase, Telophase, Metaphase, Prophase) (38) During which phase of mitosis spindles are formed (G2, Interphase, ✓Prophase, Metaphase) (39) In which stage of the cell cycle, the cell is preparing enzymes for chromosome duplication (✓G1, G2, S, M) (40) Which of the following stage of cell division is very different for animal and plant cells (Prophase, Metaphase, Anaphase, ✓Cytokinesis) (41) Which event distinguishes meiosis from mitosis 1 (Condensation of chromosomes, loss of the nuclear membrane, formation of metaphase plate, ✓pairing of homologous chromosomes) (42) In which stage of the cell cycle most cell spend their lives (Prophase, Metaphase, ✓Interphase, Telophase) (43) To what category of molecules do enzymes belong (Carbohydrates, lipids, Nucleic acid, ✓Proteins) (44) What is true about cofactors (Break hydrogen bonds in proteins, ✓Help facilitate enzyme activity, Increase activation energy, Are composed of proteins) (45) Prosthetic groups are (Required by all enzymes, loosely attached with enzymes, Proteins in nature, ✓tightly bound to enzyme) (46) In which of the following steps of respiration  $\text{CO}_2$  is produced (Glycolysis, ✓Kreb's cycle, Electron transport chain, all of these) (47) Oxygen takes part in aerobic respiration in (Glycolysis, link step between glycolysis and Kreb's cycle, Kreb's cycle, ✓Electron transport chain) (48) From which bonds of APT molecule energy is taken (✓P-P bonds, C-H bonds, C-N bonds, C-O bonds) (49) IN hch component of the leaf cells, chlorophyll is present (Stroma, ✓Thylakoids, Plasma membrane, Cytoplasm) (50) Which of these can enter into Kreb's chcle (Glucose, Pyruvic acid, Citric acid, ✓Acetyco-A) (51) How many molecules of  $\text{CO}_2$  are produced when Kreb's cycle operates once (01, 02, 03, 06) (52) In which of the following metabolic processes, oxidation as well as reduction of molecules occur (Photosynthesis, Respiration, ✓Both, none of these) (53) Chlorophyll pigment absorbs maximum light in



wavelengths of (Green and blue, Green and red, Green only, ✓ red and blue) (54) What are the primary nutrients that provide quick usable energy for the body (✓ Carbohydrates, Proteins, Lipids, Nucleic acids) (55) The wavelike movement of muscle that pushes food through the digestive system is called (Churning, Emulsification, Absorption, ✓ Peristalsis) (56) Where are the villi found (Esophagus, stomach, ✓ small intestine, large intestine) (57) Ulcers occur in the (Stomach, Duodenum, Esophagus, ✓ All of these) (58) Which group of enzymes breaks up starches and other carbohydrates (Proteases, Lipases, ✓ Amylases, None of these) (59) The pancreas produce a digestive enzymes and releases them into (Colon, Gall bladder, Liver, ✓ Duodenum) (60) In the stomach, pepsinogen is converted into (✓ Pepsin, Bicarbonate, HCl, Gastrin) (61) The diseases of Kwashiorkor and marasmus may be due to (Mineral deficiency, over-intake of nutrients, ✓ Protein-energy malnutrition, Ulcer) (62) Which food group is our body's best source of energy (Meat group, Fats/oil and sweets, ✓ Breads and cereals, Milk and cheese) (63) The process of breaking down large droplets of fat into small droplets of fat is called (✓ Emulsification, Absorption, Peristalsis, Digestion) (64) In most plants the food is transported in the form of (Glucose, ✓ Sucrose, Starch, Proteins) (65) Stomata close when the guard cells (Lose water, gain chloride ions, become turgid, gain potassium ions) (66) When fibrinogen makes blood clot, it separates from blood and the remainder is called (Plasma, Lymph, ✓ Serum, Pus) (67) Which of the following is a type of leukocyte (Macrophage, Eosinophil, Monocyte, ✓ All of the above) (68) Which cells of blood are responsible for clotting (✓ Platelets, Erythrocytes, Neutrophils, Basophils) (69) What is correct about human red blood cells (✓ Have limited life span, are capable of phagocytosis, Produce antibodies, are multinucleate) (70) Which of the following chambers has the thickest walls in human heart (Right atrium, ✓ Left atrium, Left ventricle, Right ventricle)

### (Subjective Type) (Section-I)

#### (Short Questions)

(1) Define biotechnology. (2) What do you mean by horticulture and how is it related to agriculture? (3) What are prokaryotes? (4)

Define biogeography. (5) What does communal life mean? (6) Why Bu Ali Sina is famous? (7) Define genetics. (8) What we study in biochemistry? (9) Define habitat. (10) What are biotopes? (11) What is a molecule? (12) What are tissues? (13) What is the function of muscular tissue? (14) Define population. (15) Define community. (16) Differentiate between theory and law. (17) Quantitative observations are better in biological method. How? (18) What do you mean by scientific method? (19) Define deductions. (20) Why do female mosquitoes feed on blood of mammals or birds? (21) What is meant by the word 'malaria'? (22) Define the term data. (23) What are variables? (24) What is control? (25) Define the term ratio. (26) What do you mean by proportion? (27) Name different steps of biological method of study. (28) What is the difference between the modes of nutrition of fungi and animals? (29) It is difficult to use the criterion of interbreeding to define species of unicellular organisms. (30) How are taxonomy and systematics related? (31) Differentiate between the terms 'extinct' and 'endangered'. (32) What are the contributions of Whitaker, Margulis and Shwartz in taxonomy? (33) Define classification. (34) Why classification is necessary? (35) Define species. (36) What is taxon? (37) What is meant by Two-Kingdom system of classification? (38) Give the characteristics of kingdom Monera. (39) In an ecosystem, when a species is called extinct? (40) Write two causes of deforestation? (41) State the cell theory. (42) What are the functions of leucoplasts and chromoplasts? (43) Differentiate between diffusion and facilitated diffusion? (44) What is meant by hypertonic and hypotonic solutions? (45) What do you mean by scanning electron microscopy? (46) Write the salient features of cell theory. (47) Define resolution of human eye. (48) What are the differences between light microscope and electron microscope? (49) Who discovered cell? (50) What is the function of cytoplasm? (51) What are plasmodesmata? (52) What are main functions of cell membrane? (53) Define cytoplasm. (54) Define nucleolus. (55) What are chromosomes? (56) Name three types of plastids. (57) What are chromoplasts? (58) What are leucoplasts? (59) Write down two differences between diffusion and osmosis. (60) Write down two differences between diffusion and active transport. (61)



Write the difference between exocytosis and endocytosis. (62) Define the process of filtration. (63) What are simple tissue in plants? (64) What is the function of xylem tissues? (65) Name different types of animal tissues. (66) Define nerve tissues. (67) Define companion cell. (68) Write different kinds of muscular tissues. (69) What is lateral meristem? (70) What are permanent tissues? (71) A nerve cell does not divide after its formation. In which phase of cell cycle it is? (72) How is cytokinesis different in plant cells as compared to animal cell? (73) What type of cell division occurs when our wounds are healed? (74) Plants do not make their gametes by meiosis. How is that? (75) Write the characteristics of interphase. (76) Define cell cycle. (77) Name major phases of cell cycle. (78) What happens in G<sub>1</sub> phase? (79) What happens in G<sub>2</sub> phase? (80) What is M-phase? (81) Define mitosis. (82) What are tumors? (83) Define metastasis. (84) Who firstly described meiosis? (85) Differentiate between diploid and haploid. (86) Name different phases of meiosis. (87) Define disjunction and non-disjunction. (88) Define apoptosis. (89) What do you mean by necrosis? (90) Define cofactor and coenzyme. (91) What is the main use of enzymes in paper industry? (92) Define metabolism. (93) Define anabolism. (94) Define catabolism. (95) Differentiate between catalyst and enzymes. (96) Why is it said that all life forms are dependent on photosynthesis? (97) What structures and phenomena are involved in the uptake of carbon dioxide and water by plants? (98) In what ways the respiratory energy is used in the body of organisms? (99) What is the importance of anaerobic respiration? (100) Define bioenergetics. (101) Define photosynthesis. (102) Name the conditions and factors necessary for photosynthesis. (103) What is chlorophyll? (104) Define photolysis. (105) What are pigments? (106) What are the healthy risks if we take more saturated fatty acids in our diet? (107) How can the deficiency of vitamin A cause blindness? (108) How will you differentiate between bolus and chyme? (109) Which sphincters play role in the movement of food in and out of stomach? (110) What is nutrition? (111) What is WEP? And what is its function? (112) What is a balanced diet? (113) What are deficiency symptoms of vitamin C? (114) What are amino acids? (115) What is the role of sodium in humans? (116) What are the

major minerals of human body? (117) What is meant by defecation? (118) What is alimentary canal? (119) What is emulsification? (120) What is glycogen? (121) What is gallbladder? (122) What is villi? (123) What is appendix? (124) What is bolus? (125) What is meant by gastric juice? (126) What are lenticels and where are they found in plant body? (127) What is the role of potassium ions in the opening of stomata? (128) Define cohesion-tension theory. (129) What do you mean by sources and sinks according to the pressure flow mechanism? (130) What are the two main types of white blood cells? How do they differ? (131) You see pus at the site of infection on your skin. How is it formed? (132) What role does the pericardial fluid play? (133) Define the terms systole and diastole.

## SECTION-II

- Q1.(a) How would you define biology and relate it with its major division?  
 (b) How would you distinguish the biomolecules from other molecules?
- Q2.(a) What is data? How data can be organized and analyzed? What is its importance in biological method?  
 (b) Define the terms (i) Theory (ii) Law or principle
- Q3.(a) Relate the importance of biodiversity with natural ecosystem through examples.  
 (b) Explain the bases for establishing five kingdom of living organisms.
- Q4.(a) Describe the aim and principles of binomial nomenclature.  
 (b) Identify causes of deforestation and its effects on biodiversity.
- Q5.(a) Explain the functions of cell membrane.  
 (b) Describe the structure of cell wall.
- Q6.(a) Describe the formation and function of lysosomes.  
 (b) Describe the major plant tissues i.e., simple tissues in terms of their cell specificities, locations and functions.
- Q7.(a) Describe differences in prokaryotic and eukaryotic cells.  
 (b) What is the cell cycle and what are its main phases?



- Q8.(a) Define mitosis. Also detail the events in different phases of mitosis.
- (b) Describe the events that occur during the phases of meiosis I.
- Q9.(a) How would you define enzymes? Describe their characteristics.
- (b) Describe the lock and key mechanism of enzyme action.
- Q10.(a) What is the role of chlorophyll and light in photosynthesis?
- (b) Draw a comparison of aerobic and anaerobic respiration.
- Q11.(a) How will you compare respiration and photosynthesis?
- (b) Define balanced diet. How would you relate it with age, sex and activity.
- Q12.(a) How are vitamins A, C and D important in our diets?
- (b) Describe swallowing and peristalsis.
- Q13.(a) What are the effects of the lack of nitrate and magnesium ions on plant growth?
- (b) Which food contain calcium and iron and what role these minerals play in our bodies?
- Q14.(a) Transpiration is a necessary evil. Give comments.
- (b) How do different factors affect the rate of transpiration?
- Q15.(a) Compare the structure and function of an artery, a vein and a capillary.
- (b) How do we classify blood groups in terms of the ABO and the Rh blood group systems?