BIOLOGY GRADE – 11

Unit – 1

1. What is the type of scientific research that is directly concerned with studies of the way of solving problems related to human needs?
   A. Basic science B. Applied science C. Space science D. Current science
2. For which of the following purpose do biologists use centrifuges?
   A. Measuring volume C. Culturing microorganisms
   B. Magnifying cell parts D. fractionation of cell contents
3. Which of the following is the Greek word for life?
   A. 'logos' B. 'Bio' C. Ceintia' D. 'Cell'
4. Anti-HIV/AIDS clubs are today common in schools and colleges. What is their main contribution in the fight against the pandemic?
   A. Provide medication for AIDS patients C. Encourage the girls to have boy friends
   B. Encourage the boys to have girl friends D. Raise awareness about the problem among students
5. Suppose a student noticed that many plants in a garden died following an excess application of a certain fertilizer, to which step of the scientific method would this correspond?
   A. Formulation of a hypothesis C. Observation
   B. Experimentation D. Collecting information to support hypothesis
6. Suppose in an experiment designed to test a hypothesis that water is essential for seed germination, equal number of soaked seeds were placed in vials A, B and C (group I) and dry seeds in vials D and E (group II), Which one of the following is **NOT** true about this experiment?
   A. Vials A, B and C are replications C. Vials D and E are replications
   B. Group I is the experimental group D. The experimental lacks a control group
7. What is a theory in biology?
   A. A statement without proof
   B. Hypothesis that has been supported by many experiments and/or observations.
   C. Proof that a hypothesis is true and that it is ready to conduct experiments to prove or disprove the hypothesis
   D. An statement or educated guess
8. Which one of biology studies how organisms undergo growth, differentiation and morphological changes?
   A. Physiology B. Development C. Taxonomy D. Cytology
9. Which of the following types is true about the meanings contained in the name HIV and AIDS?
   A. HIV refers to the symptoms that characterize the condition
   B. AIDS refers to the causative agent
   C. HIV refers to its probable origin from chimpanzees
   D. AIDS refers to symptoms
10. Using the following information, choose the alternative that shows the correct sequence of the scientific method:
    1.Forming a hypothesis 3. Identifying the problem
    2.Performing an experiment 4. Observation
    A. 1, 2, 3, 4 B. 4, 3, 2 ,1 C. 4, 3, 1, 2 D. 3, 4, 1, 2
11. Which of the following corresponds to the first step of the scientific method?
    A. Analyze the data collected C. Identify a topic to be studied

B. Undertake the research D. State the results

12. When trying to view an object under the microscope and after switching to the high power objective, which adjustment knob do you use in order to see a clear picture?
    A. The coarse adjustment C. The fine adjustment
    B. The middle adjustment D. The arm of the microscope
13. If you observe a piece on which several small squares are drawn, under which of the following magnifications of the microscope do you count more number of the squares?
    A. 40X B. 100X C. 400X D. 1000X
14. If, after dividing plant materials into two groups, an experimenter has applied a fertilizer to group "A" plant and not to group "B" plant, what are group "B" plants called?
    A. Control group C. Test group
    B. Experimental group D. Variable group
15. In the scientific method, which one of the following is used to test a hypothesis?
    A. Observation B. Theory C. experiment D. Prediction
16. What does an ornithologist study?
    A. The biology of mammals C. the biology of fishes
    B. The biology of frogs and reptiles D. the biology of birds
17. Which one of the following best defines modern biology?
    A. The study of animals C. The study of plant and animals
    B. The study of living things D. The study of transfer energy
18. What is the total magnification power of a microscope with a 10X ocular lens and 25X objective lens?
    A. 2.5X B. 35X C. 250X D. 2,500X
19. A field biologist who studies the behavior of primates in the forest is most likely expected to frequently use which method of data collection?
    A. Experiment B. Animal dissection C. Observation D. Comparative
20. Which one of the following objective and ocular combinations of the light microscope, respectively, gives the greatest magnification?
    A. 10X and 10X C. 40X and 12X
    B. 4X and 10X D. 100X and 10X
21. What is the term used to express the ability of a microscope to show details clearly?
    A. Enlargement B. Reduction C. Magnification D. Resolution
22. A scientifically accepted, well –tested hypothesis is known as:
    A. Theory B. Guess C. Prediction D. All of the about
23. Which of the following is **not** an important unifying theme in biology?
    A. The evolution of life C. The diversity and unity of life
    B. The interdependence of living organisms D. The variation in climatic factors
24. Which tool of the biologist is more suitable for culturing bacteria in the laboratory?
    A. Test tubes B. Microscopes C. Petri dishes D. Beakers
25. Which of the following corresponds to the beginning step of a scientific work?
    A. Testing hypotheses C. Conducting experiments
    B. Making observations D. Drawing conclusions
26. In an experiment that is testing the effect of temperature on the germination rate of certain seeds, in which one of the following should the experimental and thee control groups differ?
    A. The amount of water they receive C. The age of the seeds assigned to them.

B. The number of seeds assigned to them. D. The temperature at which they are kept.

27. Which of the following laboratory equipment is used to separate the organelles of the cell according to their density?
    A. Incubator B. Centrifuge C. Measuring cylinder. D. Filer paper with fine pores
28. Which one of the following types of microscopes is the best to show the details of the surface of an object?
    A. Optical microscope. C. Compound microscopes
    B. Scanning electron microscope. D. Transmission electron microscope.
29. Which of the following is **NOT** in agreement with the scientific method?
    A. Putting forward testable hypotheses C. Carrying out experiments in duplicates.
    B. Putting forward personal value judgments. D. Analyzing results and drawing conclusions
30. To which major area of relevance and applications of biology is the production of transgenic organisms related?
    A. Agriculture B. Environment C. Biotechnology D. Medicine
31. A cell was examined under a compound light microscope with an eyepiece lens marked 13X and an objective lens marked 40X. How many times larger would the cell appear to the viewer?
    A. 40 times B.53 times C. 400 times D. 520 times
32. In an experiment designed to test the effect of different concentrations of a fertilized on the growth of a plant, which one of the following is the dependent variable?
    A. The growth rate of the plant. C. Plats assigned to the control group
    B. Concentrations of the fertilizer applied. D. Plats assigned to the experimental group
33. What is the reason that Louis Pasteur used a swan-necked flask instead of straight necked one in his experiment designed to disprove the theory of spontaneous generation?
    A. To allow free passage of air to the broth inside the flask
    B. To prevent the escape of any microorganism from the flask
    C. To keep the broth in the flask hot to kill microorganism
    D. To trap particles from the air that might enter the flask before reaching the broth
34. A biologist applied the scientific method repeatedly, gathered a large amount of supporting experimental data and finally described a pattern or relationship between different factors. What is the best term that refers to facts established in this way?
    A. Theory B. Hypothesis C. Prediction D. Law
35. Which of the following is true about the antiretroviral drugs currently used to treat AIDS patients?
    A. They cure AIDS C. they serve as anti-HIV vaccines
    B. They stop HIV transmission D. they slow down HIV multiplication
36. Which of the following steps in the scientific method comes following observation?
    A. Prediction B. Hypothesis C. Experiment D. Theory
37. What is the specialist in biology called if he/she studies fossils to generate new knowledge on the origin and evolution of living things of part geologic periods?
    A. Geneticist B. Ecologist C. Paleontologist D. comparative Biochemist
38. Which of the following practices does **NOT** normally transmit HIV?
    A. Sexual intercourse through anus C. Sharing injection needles
    B. Blood transfusion D. Shaking hands
39. Which of the following field equipment is used to determine an exact location of a place?
    A. Theodolite B. Global positioning system C. Field microscope D. Field PH kit

40. What is a theory in biology?
    A. The outcome of an experiment
    B. A proof that shows the hypothesis is true
    C. A hypothesis supported by experiments and/or observations
    D. An opinion or educated guess resulting from observations
41. For which of the following is a theodolite used in biology education?
    A. Measuring the height of trees C. Recording positions where a species is found.
    B. Measuring the rate of flow of water in a cell. D. Measuring the pH of water or soil.
42. What is the advantage of using HAART (highly active anti-retroviral therapy) for the treatment of HIV?
    A. It gives a lasting immunity to HIV. C.It prevents mutation of HIV.
    B. It prevents re-infection by HIV. D. It helps to break the life cycle of HIV
43. On which one of the following principles are most of the anti-HIV drugs currently in use working?
    A. Inhibition of enzyme action C. Degradation of viral particles
    B. Digesting of viral particles D. Phagocytosis of the virus
44. Which of the following is a recently developed active area of research in biology today?
    A. Taxonomic study C. Ecological research
    B. Study about the cell theory D. Stem cell research
45. While conducting research, which of the following should a biologist do first?
    A. Generate hypothesis C. Conduct experiments
    B. Communicate the results D. Identify a research question/problem
46. What is the branch of biology that studies about the origin and gradual changes of living things?
    A. Microbiology B. Evolution C. Mutation D. Reproduction
47. Suppose in an experiment conducted to test a new drug, 20 people were given the drug and 20 people a placebo. What is the control of the experiment?
    A. People who received the placebo C. People who received the new drug
    B. The new drug itself D. The new drug and the placebo
48. What is the difference between HIV and AIDS?
    A. AIDS is the virus and HIV is the disease C. Both AIDS and HIV refer to the disease
    B. AIDS is the disease and HIV is the virus D. Both AIDS and HIV refer to the virus
49. Biotechnology can be applied in environmental remediation. To which of the major application areas of biotechnology is this most related?
    A. Medicine and nutrition C. Medicine and industry
    B. Biodiversity and industry D. Agriculture and environment
50. Which of the following steps of scientific methods comes before all the rest?
    A. Hypothesis B. Experiment C. Conclusion D. Reporting the result
51. What do we call a scientist who specializes in studying insects?
    A. An ecologist B .An entomologist C. A paleontologist D. A microbiologist
52. Which of the following is formulated as a possible outcome of an experiment ?
    A. Hypothesis B. Prediction C. Data analysis D. Recording the data
53. In scientific method, what is the importance of a background research for a given problem?
    A. To formulate a hypothesis C. To make a prediction
    B. To prepare report of result D. To make a conclusion
54. In which of the following ways do retroviruses differ from other RNA viruses?
    A. Their genetic material is DNA C. Their genetic material in RNA

B. They copy RNA toDNA molecule D. They copy RNA from DNA molecule

55. What is the ultimate source of all scientific knowledge?
    A. Observation B. Guessing C. Trial and error D. Observation and experimentation
56. What did Francesco Redi prove through his experiment?
    A. Maggots appear spontaneously on foods placed anywhere
    B. Maggots do not appear in foods kept in jars that are protected with a cover
    C. Maggots do not appear in foods kept in open air.
    D. Flies appear spontaneously on rotting meat kept in closed or open jars.
57. What an ethologist study?
    A. Insect diets B. Soil types C. Fossil fuel D. Animal behavior
58. What do you call the reasoning technique in science where general principles are used to analyze specific cases?
    A. Induction B. Deduction C. Pseudo-deduction D. Pseudo-induction
59. Choose the step comes at the last step in the scientific method
    A. Proposing the hypothesis C. Formulation of a scientific theory
    B. Conducting experiment D. Making prediction
60. Which of the following is a worthwhile biological problem for scientific investigation?
    A. Estimation of the amount of carbon in a forest ecosystem
    B. How a crying dog can tell who among elders of the village is going to die next
    C. How witchcraft inflict bad health by cursing a healthy person
    D. How the traditional medicine men/women cure a possessed person
61. Which of the following is the correct sequence of the steps in scientific research?
    A. AHypothesis formulation ➜ conclusion ➜ experiment ➜ question
    B. Question ➜ Hypothesis formulation ➜ experiment ➜ conclusion
    C. Hypothesis formulation ➜ question ➜ experiment ➜ conclusion
    D. Question ➜ hypothesis formulation ➜ conclusion ➜ experiment
62. Which of the following types of cancer is known to mostly developed in AIDS patients?
    A. Cervical cancer B. Stomach cancer C. Kaposi's sarcoma D. Breast cancer
63. For what purpose do biologists use the GPS receiver?
    A. To produce area maps C. To measure tree heights
    B. To estimate tree ages D. To count tree rings
64. In an experiment designed to study the effect of temperature on the rate of seed germination, which of the following the experimenter varies?
    A. Seed number B. Water quality C. Temperature D. Seed size
65. "Rats can be produced by keeping rags and grains at a corner of a room". Which of the following line of thinking supports this statement?
    A. Darwinian evolution C. Spontaneous generation
    B. Alternation of generation D. Sexual reproduction
66. What is the specific name of biological scientists who do research that tries to find evidence of life on other planets in solar system?
    A. Neurobiologists B. Paleontologists C. Astrobiologists D. Biogeographers
67. Which of the following is NOT a universal property of all living things?

A. Heritable characters B. Reproduction C. Photosynthesis D. Growth and development

68. How does a simple microscope differ from a compound microscope?
    A. A simple microscope has no lens C.A simple microscope has got two lens
    B. A simple microscope uses mirrors as lens D. A simple microscope has only one lens.
69. Which of the following is the major mechanism by which AIDS is transmitted?
    A. Mother to fetal transmission C. Heterosexual intercourse
    B. Homosexual intercourse D. Contaminated blood transfusion
70. Which of the following types of microscopes is most suitable for a detailed study of surface structure of an object?
    A. Field microscope C. Optical microscope
    B. Scanning electron microscope D. Dissecting microscope
71. Which of the following is consistent with science?
    A. Proof by investigation of the causes of a phenomenon
    B. Proof by reference of a respected leader
    C. Proof by reference to an unknown object
    D. Proof based on lessons from a person one believes
72. Which of the following are all the tools mainly used in the laboratory rather than in field situation?
    A. Centrifuges, microscopes, measuring cylinders, petri dishes
    B. Flow meters , centrifuges, theodolites, microscopes
    C. Centrifuges, plant presses, flow meters, microscopes
    D. Theodolites, petri dishes, GPS receivers, measuring cylinders
73. Which research can most likely discover a vaccine that may be used against AIDS?
    A. Agricultural research B. Biological research C. Social research D. Space research
74. What is the good thing about having a control group in scientific experimentation?
    A. It reduces the validity of experimental results by reducing the factors
    B. It reduces the reliability of the experimental results by adding more samples
    C. It provides a means for correcting experimental data & adjust to expectations
    D. It provides a standard against which the experimental results can be compared
75. Which tool of the biologist is expected to be found in a standard dissecting kit?
    A. A magnifying glass B. An insect net C. A pitfall traps D. A centrifuge
76. Suppose you have observed a spot where somebody had urinated is swarmed by ants, Which of the following would you do first if you want to study the reason in a scientific manner?
    A. Making prediction C. Formulating hypothesis
    B. Carrying out experiments D. Gathering background information
77. In scientific investigation, which of the following variables CANNOT be controlled by the experimenter?
    A. Independent variable B. Dependent variable C. Confounded variable D. Experimental variable
78. Which of the following equipment is used by field biologists to estimate the abundance of organisms in an area?
    A. Quadrant B. Theodolite C. Plaint press D. Global positioning system (GPS
79. In which of the following health problems can the signal for the final stage of HIV/AIDS infection be found?
    A. Nervous system B. Digestive system C. Circulatory system D. Immune system
80. The word science comes from the Latin word ‘scienta’ meaning what?
    A. Study B. experiment C. life D. knowledge

81. Which of the following laboratory tools is LEAST accurate to measure 1ml of liquid?
    A. Pipette B. Measuring cylinder C. Burette D. Beaker
82. In a report of a scientific experiment, description of which of the following comes before all the other?
    A. Procedure B. result C. hypothesis D. conclusion
83. From among the following, chose the field which is a branch or parts of biotechnology.
    A. Parasitology B. immunology C. phycology D. genetic engineering
84. Which of the following laboratory glassware is used for culturing bacteria?
    A. Petri dish B. Test tube C. Filter paper D. Measuring cylinder
85. Which of the following is publicly an UNDESIRED research activity?
    A. Breeding a new crop variety C. synthesis of new vaccine
    B. Manufacturing of a new medicines D. breeding a new pathogenic microorganism
86. Which of the following is the first step in starting a research process?
    A. Identification of problem C. searching solution to the problems
    B. Searching sources of information to local problem. D. survey of related literature
87. For which of the following purposes is Global Positioning System (GPS) used?
    A. Map of the area B. Theodolite C. Satellite signal D. Microwave
88. Which one of the following is the best scientific approach to come to conclusive evidence showing that a given event is caused by a certain factor?
    A. Conducting an experiment C. making a good guess
    B. Having a strong belief D. making systematic observation
89. Which of the following tools is used by a biologist to study the internal anatomy of experimental animals?
    A. Hand lens B. dissecting kit C. petri dish D. Microscope
90. What material do microbiologists use to culture bacteria in the laboratory?
    A. Agar nutrient B. the royal jelly C. Moist soil D. mixture of iodine and sugar
91. The sets in which scientists usually conduct two or more sets of the same experiment at the same time is:
    A. Experimental group C. control group
    B. Experimental design D. replication
92. The hypothesis which a scientist tries to disprove is called:
    A. Alternative hypothesis C. Null hypothesis
    B. Ad hoe hypothesis D. Auxiliary hypothesis
93. Within a few weeks after a heavy rain, pools become teemed with tadpoles. What is the source of the tadpole?
    A. The rain water C. the eggs laid by frogs
    B. The decaying vegetation of the pond D. the mud on the floor
94. In which of the following is the current state of biology more of promises that realized major contribution?
    A. Food production by GMO and genetic engineering
    B. Pest control and understanding about diseases
    C. Food production and population control
    D. Understanding of health and biodiversity conservation
95. Through which of the following methods can blood be separated into its cellular and fluid parts?
    A. Separating funnel B. fractional distillation C. centrifuging D. simple diffusion

Biology Grade – 11

Unit – 2

1. Which of the following elements occur more abundantly in living organisms than the others?
   A. Aluminum B. Phosphorus C. Lead D. Zinc
2. Both plant and humans keep in their bodies the stored forms of carbohydrates. What are these stored forms called, respectively?
   A. Glycogen, starch B. Starch, cellulose C. Starch, glycogen D. Cellulose, glycogen
3. In which of the following is the macromolecule correctly matched with its monomer building blocks?
   A. Carbohydrates – Glycerol C. Lipids – Amino acid
   B. Proteins – Fatty acids D. Nucleic acids – Nucleotides
4. How many carbon atoms are contained in two molecules of glucose?
   A. 6 B. 12 C. 16 D. 24
5. Of the constituents of protoplasm, which one is inorganic in nature?
   A. Starch B. Protein C. Water D. None of the above
6. Which of the following is the most abundant form of carbohydrate on earth?
   A. Starch B. Cellulose C. Glycogen D. Chitin
7. In which of their constituents do the nucleotides of DNA and RNA differ from each other?
   A. In the purine bases C. In the phosphate group
   B. In the pyrimidine bases D. In all of the above
8. Which one of the following elements is found in protein and nucleic acids but does not occur in carbohydrates?
   A. Carbon B. Nitrogen C. Oxygen D. Hydrogen
9. What is the stored form of sugar that is found human tissues?
   A. Cellulose B. Coenzyme C. Nucleic acid D. Glycogen
10. Which of the following classes of crops is a good source of proteins?
    A. Leafy vegetables B. Cereals C. Pulses D. Roots and tubers
11. What makes phospholipid molecules arrange themselves into a bilayer in a water medium?
    A. The double bonds of the fatty acids C. The length of the fatty acids
    B. The presence of hydrophilic and hydrophobic groups D. Their high solubility in water
12. Which of the following is a polysaccharide?
    A. Sucrose B. Glucose C. Cellulose D. Fructose
13. Choose the alternative that shows the monomer and polymer of carbohydrates?
    A. Nucleotied, amino acid C. Monosaccharide, polysaccharide
    B. Polypeptide, polynucleotide D. Nucleic acid amino acid
14. Which of the following is the most abundant polysaccharide found in plants?
    A. Glycogen B. Cellulose C. Sucrose D. Starch
15. What term is used to describe the chemical process of living organisms that involves both the joining up of monomers to produce polymers and the splitting of polymers to monomers?
    A. Anabolism B. Metabolism C. Catabolism D. Polymorphism
16. Which alternative correctly marches the polymer with its monomer?
    A. Carbohydrate- amino acid C. Nucleic acid – nucleotide
    B. Protein – monosaccharide D. Lipid – fat
17. All of the following carbohydrates are polysaccharides except which?

A. Glucose B. Cellulose C. Starch D. Glycogen

18. Which one of the following sugars do babies get from the milk of their mother
A. Maltose B. Sucrose C. Lactose D. Fructose

19. Which of the following are **not** included in lipids?
A. Nitrogenous bases B. Waxes C. Steroids D. Phospholipids

20. Which of the following is true about both DNA and RNA?
A. Both are single stranded C. Both have a five carbon sugar
B. Both are polymers of amino acids D, Both contain the same four nitrogenous bases

21. Which property of water keeps the bottoms of lakes and the life in there from being frozen during cold winters in the temperate regions?
A. Its highest density at 4 C^0 C. its high boiling point
B. Its high heat of vaporization D. Its high latent heat of fusion

22. Which of the following helps to keep the biological membranes in a fluid state?
A. Waxes B. Phospholipids C. Cholesterol D. Water

23. Which of the following compounds is an important component of the exoskeleton of arthropods such as insects?
A. Oil B. Sugar C. Protein D. Chitin

24. How many carbon atoms are contained in a single molecule of sucrose?
A. 6 B. 12 C. 24 D. 48

25. Which of the following compounds is an important component of the bacteria cell wall?
A. Chitin B. Peptidoglycan C. Cellulose D. Pectin

26. Which of the following pairs of elements are fond in all carbohydrates in addition to the element carbon?
A. Nitrogen and Oxygen C. Hydrogen and Oxygen
B. Hydrogen and nitrogen D. Phosphorus and nitrogen

27. In the process of amino acid condensation, which one of the following happens?
A. Oxygen is used up. C. Carbon dioxide is released
B. Water is released as a byproduct D, Protein is broken down into amino acid

28. Which of the following properties of water makes sweat an effective body cooler?
A. Its high specific heat. C. Its low density when frozen.
B. Its high surface tension. D. Its high heat of vaporization.

29. Why does sucrose give a negative result when mixed and heated with Benedict's solution?
A. Because it is not a sugar molecule C. Because it is a reducing sugar
B. Because it is a non - reducing sugar D. Because it is not a monosaccharide

30. What color is expected upon hearing a mixture of glucose and Benedict′s solution?
A. Blue black B. Brick red c. Yellow D. Light blue

31. Among the molecules found in cells, which of the following contains less energy?
A. A glucose molecules B. An amino acid C. A triglyceride D. A water molecule

32. In which one of their structural parts do different molecules of amino acids differ from one another?
A. In their R group C. In their amino group
B. In their carboxyl group D. In their alpha-carbon group

33. If one mixes a sample of a fruit juice and some drops of Benedict's solution and obtains a brick-red precipitate upon warming the mixture, what does the juice contain?
A. Starch B. Reducing sugar C. Sucrose D. Protein

34. The main component of the plant cell wall is _____?

A. Starch B. Cellulose C. Protein D. Chitin

35. How many carbon atoms are there in one disaccharide molecule?
    A. 6 B. 12 C. 18 D. 24
36. All proteins contain carbon, hydrogen, oxygen and what other element?
    A. Chlorine B. Flourine C. Nitrogen D. Sulphur
37. What makes unsaturated fatty acids different from saturated fatty acids?
    A. The presence of long chain of carbon. C. The presence of one or more double bonds.
    B. The presence of large number of hydrogen atoms. D.Their occurrence as solid at room temperature.
38. What is the name of the sugar found in milk?
    A. Glucose B. Lactose C. Maltose D. Sucrose
39. In which of its contents RNA differs from DNA?
    A. Deoxyribose and guanine C. Ribose and thymine
    B. Ribose and uracil D. Phosphate and adenine
40. Which of the following groups of substances are all inorganic?
    A. Water, sugar, calcium carbonate C. Sugar, fatty acid, amino acid
    B. Water, calcium carbonate, carbon dioxide D. Carbon dioxide, amino acid, fatty acid
41. In which of the following compounds are both members of the pair are polymers of carbohydrates that naturally occur in plants only?
    A. Starch and chitin C. Starch and cellulose
    B. Glycogen and cellulose D. Glycogen and chitin
42. Which of the following is generally expected to give better health benefits when present in human diet?
    A. Animal fat C. Saturated Fatty acid
    B. Monounsaturated fatty acid D. Polyunsaturated fatty acid
43. Which of the following is a distinguishing feature of amino acids that is **NOT** found in carbohydrates?
    A. Carbon B. Oxygen C. Hydrogen D. Nitrogen
44. Which one of the following molecules in living things is **NOT** an organic molecule?
    A. Sugar B. Nucleotide C. Amino acid D. water
45. How many carbon and oxygen atoms are there in a molecule of maltose?
    A. 6 carbon and 6 oxygen C. 12 carbon and 11 oxygen
    B. 11 carbon and 12 oxygen D. 24 carbon and 12 oxygen
46. Which of the following carbohydrates has structural function?
    A. Cellulose B. Glycogen C. Starch D. Sucrose
47. What can one conclude about the contents of the foodstuff if a mixture of Benedict solution and a foodstuff remain blue after heating?
    A. It contains proteins. B. It lacks starch C. it contains fats. D. it lacks reducing sugar.
48. Which group of organic compounds includes the enzymes?
    A. Proteins B. Lipids C. Starches D. Carbohydrates
49. Which of the following is true about saturated fatty acids?
    A. They have single bonds between carbon atoms
    B. They are the same as polyunsaturated fatty acids
    C. They are the same as monounsaturated fatty acids
    D. They have double bonds between the carbon atoms
50. Which protein structure found in antibodies is responsible for the ability of a protein to bind to a specific antigen and destroy it during antigen-antibody reaction?

A. Primary C. Secondary C. Quaternary D. Tertiary

51. Which of the following is true about the substance represented by the chemical formula "$C_2H_2NO_2$"?
    A. Simple sugar B. Inorganic substance C. Fatty acid D. Amino acid
52. Choose the one that represents a chemical formula of an organic compound?
    A. $C_{12}H_{22}O_{11}$ B. $Mg(OH)_2$ C. NH_3 D. NaCl
53. How are unsaturated fats distinguished?
    A. They are made up of glucose & fructose
    B. They are made up of amino acids & glycerol
    C. They have double bonds in their carbon chains
    D. They have only single bonds at the points of attachment
54. Which of the following is produced when a lipid molecule is hydrolyzed?
    A. Amino acids & water C. Fatty acids & glycerol
    B. Amino acids & glucose D. Glucose & glycerol
55. A carbohydrate compound is known to have 12 carbon atoms in the whole molecule. What could this compound be?
    A. A polypeptide B. A disaccharide C. A monosaccharide D. A polysaccharide
56. If certain food stuff gave a positive result with Benedict test only after it was hydrolyzed with hydrochloric acid, which of the following substances could it be ?
    A. Non-reducing sugar B. Nucleic acid C. Lipid D. Protein
57. Which of the following molecules is **not** a polymer?
    A. Protein B. Lipid C. RNA D. Starch
58. Which of the following classes of organic molecules is the least important source of energy for cellular respiration?
    A. Nucleic acid B. Lipids C. Carbohydrates D. Proteins
59. Which element is found in nucleic acids?
    A. Calcium B. Iron C. Magnesium D. Phosphorus
60. What is the base found in RNA in place of thymine of DNA?
    A. Cytosine B. Guanine C. Thymine D. Uracil
61. In the formation of a macromolecule, what type of reaction would join two subunits together?
    A. Hydrolysis reaction B. Denaturation reaction C. Dehydration reaction D. Hydrophobic reaction
62. Which of the following is an inorganic molecule?
    A. $CaCO_3$ B. CH_4 C. $C_6H_{22}O_{11}$ D. $C_{18}H_{36}O_2$
63. To which group of organic compounds do the triglycerides and waxes belong?
    A. Carbohydrates B. Proteins C. Lipids D. Vitamins
64. Which of the following is true about all proteins?
    A. They are twenty amino acids long C. They are globular in shape
    B. They perform the same function D. The monomers are held together by peptide bond
65. Which two nitrogenous bases belong to the purines?
    A. Adenine and thymine B. Adenine and guanine C. Guanine and cytosine D. Thymine and uracil
66. Which one of the following is a functional group of fatty acids?
    A. A ketone group B. An aldehyde group C. An amino group D. A carbohydrate group
67. Which of the following food types would most likely give a negative result upon addition of iodine solution?
    A. Bread B. Butter C. Biscuit D. Potato
68. How many fatty acids would a cell need to form a molecule of triglyceride?

A. Two B. Four C. Five D. Three

69. Which one of the following molecules can serve as a raw material for industries that produce glucose?
A. Nucleic acids B. Proteins C. Lipids D. Starch

70. According to the fluid-mosaic model of the plasma membranes, what does the word′ mosaic′ refer to?
A. The hydrophobic property of fatty acids C. The bilayer nature of the membrane
B. The arrangement of the proteins D. The movement of the phospholipids

71. Which of the following organic compound would release both nitrogen and sulfur to the ecosystem when decomposed
A. Polysaccharides B. Sucrose C. Proteins D. Lipids

72. Which of the following classes of fatty acids is without carbon-carbon double bond?
A. Monounsaturated fatty acids C. Unsaturated fatty acids
B. Saturated fatty acids D. Polyunsaturated fatty acids

73. What is the substance that helps to keep the biological membrane in a fluid state?
A. Waxes B. Water C. Cholesterol D. Phospholipids

74. What are hexoses?
A. Disaccharides with 6 carbon atoms C. Disaccharides with 6 oxygen atoms
B. Monosaccharide with 6 carbon atoms D. Monosaccharide with 6 oxygen

75. In which of the following is the element correctly matched with its main function in human body?
A. Calcium -- builds bones , teeth & muscles C. Chlorine -- help blood carry oxygen
B. Iron-- protect teeth enamel D. Fluorine -- digest food

76. Which of the following elements is most abundant in human cells?
A. Sulphur B. Phosphorus C. Oxygen D. Nitrogen

77. Which of the following correct?
A. In a triglyceride there are three fatty acids and glycerol
B. In a triglyceride there is one fatty acids & glycerol
C. An unsaturated fatty acids has only a single C-C bond
D. A saturated fatty acids has a single C-C bond

78. What is it that distinguishes organic from inorganic molecules?
A. Presence of C & O B. Presence of H & O C. Presence of C & H D. Presence of C & N

79. What is the main physiological advantage that certain storage carbohydrates such as glycogen are highly branched polymers?
A. Fast release of glucose C. Slow polymerization of glucose
B. Easy diffusion of food between cells D. Creation of high osmotic potential in cells

80. Which of the following elements is found in the chlorophyll molecule?
A. Magnesium B. Calcium C. Iron D. Phosphorus

81. Which of the properties of water allows mosquito larvae to hung themselves dawn into the water from the water surface?
A. Its high specific heat capacity C. Its high surface tension
B. Its hihg latent of vaporization D. Its low density in solid state

82. Of the following organic molecules, which one includes a pentose sugar?
A. Glucose B. Deoxyribose C. Galactose D. Fructose

83. To which group of sugars can the molecule dihydroxyacetone be classified?
A. Triose sugar B. pentose sugar C. hexose sugar D. oligosugar

84. Which of the following two elements are found in all organic molecules

A. Carbon & oxygen B. carbon & nitrogen C. carbon & phosphorus D. carbon & hydrogen

85. If two molecules of a six carbon sugar are condensed to form a disaccharide, which of the following is the correct molecular formula of the disaccharide?

A. $C_{12}H_{22}O_{11}$ B. $C_6H_{12}O_6$ C. $C_{12}H_{24}O_{12}$ D. $C_{11}H_{12}O_{11}$

86. How many molecules of glycerol and fatty acids, respectively, are needed to form 100 molecules of triglyceride fat?

A. 100 and 300 B. 100 and 100 C. 50 and 50 D. 150 and 400

87. Which one of the following properties of water makes sweat a good body coolant?

A. Its strong surface tension C. its low density in a solid state

B. Its high heat of vaporization D. its strong adhesion to a surface

88. What is the possible effect of the weak hydrogen bond among water molecules

A. Play a significant role in the interaction of a water molecule with hydrophobic surface

B. It helps water to boil at low temperature

C. It results in the crystal shape of ice

D. It speed up photosynthesis

89. How are organic molecules distinguished from inorganic molecules? Organic molecules always contain:

A. Oxygen and hydrogen B. Carbon and hydrogen C. carbon and oxygen D. oxygen and nitrogen

90. Which of the following determines the primary structure of a polypeptide?

A. The peptide bond B. The coding gene C. The hydrogen bonds D. The disulphide bridges

91. In which of the following is the proteins structure and its description MISMATCHED?

A. Secondary protein structure - beta pleated sheet

B. Primary protein structure - folded protein chain

C. Secondary protein structure - alpha helix structure

D. Quaternary protein structure * two or more folded chains

92. At which level structural organization do proteins have the alpha-helix shape?

A. Primary structure C. Secondary structure C. Tertiary structure D. Quaternary structure

93. Of the following functions, which one do triglycerides accomplish in cells?

A. Increase density of tissues and cells C. Increase thermal insulation of cells

B. Yield limited amount of ATP for cells D. Facilitate entry of excess water into cells

94. Which of the following is made of globular proteins?

A. Enzyme B. Keratin C. Collagen D. Glycogen

95. What are the compounds that have the same chemical composition, but different arrangement of atoms?

A. Anomers B. Isomers C. polymers D. Monomers

96. Of the following four elements, which one is the least abundant in living things?

A. Oxygen B. Hydrogen C. Carbon D. Sulfur

96. Which of these elements known to have less than 10% occurrence in many cells?

A. Carbon B. hydrogen C. Nitrogen D. oxygen

97. One of the following is none – carbohydrate molecule.

A. Starch B. Cellulose D. glycogen D. Collagen

98. When glucose molecules are joined by α-linkage which of the following carbohydrate is obtained?

A. Lactose B. Starch C. Glycogen D. Cellulose

99. Lipids to become sphingolipids must contain:

A. Glycerol B. Nitrogen C. Alcohol D. Triglycerides

Biology Grade – 11

Unit – 3

1. What is the shape of an enzyme molecule?
   A. Globular B. linear C. Branched D. pleated
2. To which group of compounds do enzymes belong?
   A. Lipoproteins C. Globular proteins
   B. Fibrous proteins D. Deoxyribonucleic acid
3. If an enzyme has its optimum activity at neutral P^H, to which of the following P^H values does this correspond?
   A. P^H 14 B.P^H 7 C. P^H 12 D. P^H4
4. What is true about the rate of an enzyme catalyzed reaction if the enzyme concentration is kept constant and the substrate is supplied in excess? The rate would:
   A. Rise continuously C. Decline sharply
   B. Stay constant D. None of the above
5. Among the following, identify the molecule that is an enzyme:
   A. Starch B. Cellulase C. Cellulose D. Glycogen
6. An enzyme known as catalase converts hydrogen peroxide into water and oxygen. In this reaction which one is the substrate?
   A. Catalase B. Hydrogen peroxide C. water and oxygen D. water only
7. Identify the enzyme that is used to cut DNA molecules into small pieces?
   A. Urease B. Reverse transcriptase C. DNA polymerase D. Restriction endonuclease
8. Identify the statement that more correctly explains why each cell contains so many different types of enzymes? Enzymes are
   A. Consumed in the process of catalysis C. Used over and over again
   B. Specific to their substrates. D. Easily synthesized
9. To which category of enzymes do the digestive enzymes that breakdown food substances in the human alimentary canal belong
   A. Intracellular enzymes C. Extracellular enzymes
   B. Globular enzymes D. Fibrous enzymes
10. If an enzyme is provided with its normal substrate plus another molecule having the same shape and size as the substrate, which one of the following would happen?
    A. Allosteric inhibition C. Irreversible inhibition
    B. Competitive inhibition D. End product inhibition
11. If one keeps on adding a substrate to a fixed amount of an enzyme, when does the reaction rate reach a plateau?
    A. When all the substrate is converted to products
    B. When all the active sites of the enzymes are occupied
    C. When most of the enzyme molecules are consumed
    D. When much of the products are accumulated
12. Which of the following is **true** about those bacteria which dwell in hot springs
    A. They are not metabolically active C. They get energy of activation from the spring heat
    B. They use non-protein enzymes D. Their enzymes do not denature at that temperature
13. Which factor has a more negative effect on the functions of enzymes than the others?

A. Neutral PH C. Very high temperature.
B. Optimal amount of salt concentration. D. Optimal amount of substrate concentration

14. What do we call the substance upon which an enzyme acts?
A. Product C. Substrate
B. Activation energy D. Enzyme-substrate complex

15. When an enzyme is denatured by heat or extreme PH, which one of the following does it lose?
A. The peptide bond. C. Secondary structure.
B. Primary structure. D. Tertiary structure.

16. In Which one of the following points does the induced-fit model of enzyme action differ from the lock-and-key model?
A. Enzyme lower the energy of activation
B. Substrates bind at the active site of the enzyme
C. During the reaction, an enzyme-substrate complex is formed.
D. The shapes of the substrate and active site are complementary.

17. Which of the following mechanisms do cells use to regulate enzymes catalyzed reactions in metabolic pathways?
A. Enzyme denaturation C. Irreversible inhibition
B. End product inhibition D. Competitive inhibition

18. Suppose 25% of the molecules of an enzyme are inhibited by a non-competitive inhibitor, which one of the following would happen if the amount of the substrate is increased by 50%?
A. The reaction rate would double.
B. More enzyme molecules would get inhibited.
C. The rate of the reaction would decrease by 50%.
D. The rate of the reaction would remain unchanged.

19. In competitive inhibition, which one of the following factors determines the rate of the inhibition?
A. The reaction temperature. C. The enzyme concentration
B. The substrate concentration D. The ratio of inhibitor to enzyme concentration

20. What are the environmental advantages of using enzymes in industry?
A. It makes high production possible with less input of heat.
B. It makes high production possible with high input of heat.
C. It makes high production possible with emission of more CO_2.
D. It helps high production with supply of more heat and emission of more CO_2

21. Which of the following classes of enzymes digests carbohydrates?
A. Amylases B. Lipases C. Proteases D. Nucleases

22. One of the following molecules is the building units of an enzyme molecule.
A. Amino acids B. Glucose C. Nucleotides D. Fatty acids

23. Which of the following pairs of molecules are known to have catalytic activity?
A. Lipids and proteins C. Proteins and RNAs
B. Carbohydrates and proteins D. Proteins and DNAs

24. To which class of enzymes do the digestive enzymes belong?
A. Esterases B. Transferases C. Hydrolases D. Isomerases

25. Which of the following types of enzyme inhibitions can be removed when the end product of the metabolic pathway is depleted?
A. Allosteric inhibition C. Non-reversible inhibition

B. Competitive inhibition D. Reversible competitive inhibition

26. In the case of enzymatic chemical reactions, what do you call the substance that is acted upon by an enzyme?
    A. Polypeptide B. Coenzyme C. Vitamin D. Substrate
27. Which of the following is the common characteristic of all enzymes?
    A. They act inside cells only C. They are proteins
    B. They require cofactors D. They operate at any PH
28. Which of the following pH values represents the strongest base?
    A. 2 B. 7 C. 13 D. 15
29. Into which of the following organic compounds can lipase, maltase and sucrase be grouped?
    A. Hormones B. Carbohydrates C. Nucleic acids D. Enzymes
30. For a biological detergent to effectively remove oily and greasy dirt, which of the following enzymes should it contain?
    A. Cellulose B. Protease C. Amylase D. Lipase
31. Which region of the human digestive tract contains enzymes that perform well at low pH?
    A. Mouth B. Stomach C. Small intestine D. Large intestinal
32. To which one of the following organic molecules do enzymes belong ?
    A. Carbohydrates **B**. Amino acids C. Proteins D. Lipids
33. Which of the following is a coenzyme?
    A. NAD B. Carbohydrates C. Water molecule D. Protein
34. Which of yhe following substances has a shape which is similar to that of the substrate of an enzyme?
    A. The reaction product C. A competitive inhibitor
    B. A cofactor D. An allosteric inhibitor
35. Which one of teh following terms refers to how fast an enzyme acts on its substrate?
    A. Turn over number B. Substrate number C. Enzyme number D. Product number
36. What does a restriction enzyme do?
    A. Restricts transcription C. Prevent DNA from replicating
    B. Cuts DNA at specific sites D. Hydrolyzes the DNA molecule
37. The optimum temperature of enzymes found in thermophilic bacteria is:
    A. Lower than for enzymes in the human body C. higher than enzymes in the human body
    B. the same as enzymes found in human body D. lower than enzymes found in warm blooded animals
38. If the rate of enzyme catalyzed reaction remains constant even when more substrate is added to the reaction, which of the following might be the reason?
    A. Saturation of the enzyme C. Inhibition of enzyme- substrate complex formation
    B. Inactivation of the enzyme D. Loss of substrate specificity by the enzyme
39. Which of the following will primarily happen if the enzymes in the lysosomes of a cell are defective?
    A. Cellular debris will not be removed C. Chromosome replication will cease
    B. ATP production will stop D. Diffusion process will stop
40. Which of the following properties of enzymes makes it possible that a single enzyme molecule can act on many substrate molecules?
    A. Enzymes are proteins C. Enzymes lower the energy of activation
    B. Enzymes are reused over and over again D. Enzymes are substrate specific
41. Which process produces mRNA during protein synthesis?
    A. Translation B. Replication C. Mutation D. Transcription

42. Which part of the human alimentary canal contains digestive enzymes that functions at acidic pH 7?
A. Stomach B. Mouth C. Esophagus D. Small intestine
43. In which area of enzyme application is invertase injected to sucrose paste in order to produce liquid chocolate?
A. Detergent making industry C. Pharmaceutical industry
B. Palp and paper industry D. Food processing industry
44. Which one of the following functions best at higher optimum pH than all the rest?
A. Pepsin B. Salivary amylase C. Trypsin D. Enzyme in stomach
45. Which class of enzyme joins two molecules together by formulation of new bonds?
A. Ligase B. Isomeras C. Lyase D. Hydrolase
46. In an enzymes that contains non- protein organic molecules, in addition to the protein component, what is the protein component called?
A. Apoenzyme B, Coenzyme C. Holoenzyme D. Cofactor
47. Which one of the following should be done in order to remove an enzyme inhibition caused by a competitive inhibitor?
A. Remove affected enzyme molecules C. Add more substrate to the system
B. Remove the end product of the reaction D. Add more inhibitor to the system.
48. How many amino acids are there in all known proteins?
A. About 10 B. About 35 C. About 20 D. About 46
49. Deficiency of which of the following nutrients in human diet is likely result in a deficiency of some co-enzymes like FAD?
A. Essential amino acids B. Vitamins C, Carbohydrates D. Saturated fatty acids
50. What causes tomato fruits to ripen much more slowly when kept in a refrigerator than if left on a table at room temperature?
A. Low temperature slows the normal action of ripening enzymes
B. Enzymes produced by bacteria normally inhibit ripening
C. Humidity accelerates enzyme activity and ripening process
D. Normal temperature arrests the action of ripening enzymes
51. In what way is the lock - and -key model of enzyme molecule assumed to be different from the induced-fit model?
A. It has low turnover rate
B. It does not form enzyme-substrate complex
C. It cannot effectively reduce the activation energy
D. Shape of active site and the substrate complement
52. Which property listed below is NOT true about enzymes?
A. They speed up specific chemical reactions
B. . They are used up in the reaction they catalyze
C. They are affected by pH and substrate concentration
D. Small amounts can change large amounts of substrate
53. Which of the following belongs to the class of enzymes known as transferase?
A. Kinases B. Esterases C, Fumerases D.Aldolases
54. What is the functional group of the building blocks of proteins called?
A. Amino group B. Ketone group C. Carboxyl group D. Aldehyde group
55. What is an alternative name for the enzyme pepsin?

A. Trypsin B. Lipase C. Gastric protease D. Gastric polymerase

56. Which of the following statement is **INCORRECT** with respect to an enzyme's ability to catalyze a reaction?
    A. An enzyme binds reactants such that they are positioned correctly and can attain their transition - state configurations.
    B. An enzyme allows the reaction to go through a more stable transition state than would normally be the case.
    C. An enzyme can weaken bonds in reactants through the binding process.
    D. An enzyme provides a reaction surface and a hydrophilic environment for the reaction to take place.
57. What does an enzyme do to a chemical reaction that allows it to proceed optimally?
    A. It increase the amount of the substrate C. it lowers the required activation energy
    B. It increase the required activation energy D. it modifies both the PH and the temperature
58. Which of the following is **NOT** a characteristic of an enzyme?
    A. It is converted to products C. it function as a catalyst
    B. It is globular protein D. it lowers activation of energy
59. Choose the one in which the human digestive enzyme is **incorrectly** matched with the substance that it normally catalyzed?
    A. Lipase – fat C. pepsin – protein
    B. Trypsin – starch D. pancreatic amylase – starch
60. Significant change in PH that can affect an enzyme molecule include:
    A. Altering the change on some substrate making it difficult to bind to enzyme.
    B. Building strong ionic bonds leading to stabilization of enzyme
    C. Changing the color and palatability of food items
    D. Increasing the boiling temperature of the substrate
61. In a metabolic pathway (A→ B→C→ →D), where each step is catalyzed by a separate enzyme, which substance in the pathway serves as an allosteric regulator?
    A. substance A B. substance B C. substance C D. substance D
62. Which kind of enzyme inhibitors bind to enzymes only weakly and the bond that holds them breaks easily releasing the inhibitor to allow the enzyme to become active again?
    A. Irreversible inhibitors C. inhibitors that bind strongly to enzymes
    B. Inhibitors that permanently alter enzyme structure D. reversible inhibitor
63. In which industrial enzyme technology is lactase practically applied to produce lactose free milk for use by lactose intolerant individuals?
    A. Diary product manufacturing industry C. chocolate manufacturing industry
    B. Human hormone manufacturing industry D. cereal food manufacturing industry
64. Which one of the following condition is least likely to denature an enzyme?
    A. High temperature B. extreme PH C. Heavy metal ions D. Low temperature
65. The industrial use of enzymes is helpful for the environment as it contribute to reduction of CO_2 emission. In which of the following is there more mass of CO_2 emission saved per ton of products by using enzyme technology rather than traditional method?
    A. Bread making B. manufacturing of cosmetics C. paper making D. cheese making
66. Which model of enzyme action requires that the shape of the substrate molecules is complementary to that to the active site?
    A. The induced – fit model C. the lock-and –key model

B. The activation energy model D. the enzyme function model

67. Which of the following statement is NOT correct about the effect of temperature on enzymes?
    A. Raising the temperature increase the kinetic energy of the molecules
    B. A ten degree centigrade increase in temperature may increase the activity of most enzymes by 50% to 100%.
    C. Most enzymes are insensitive to temperature
    D. Most enzymes are denatured at 40 degree centigrade
68. Which of the following factors affects enzyme activity without denaturing the enzyme molecule?
    A. High temperature B. Low temperature C. High PH D. Low PH
69. Which of the following can reverse or reduce an allosteric enzyme inhibition?
    A. Adding more substrate C. Depleting the substrate
    B. Adding more end products D. Depleting the end product
70. In the human body; which conditions are generally considered optimum for most enzymes?
    A. 37^0C and PH1.0 B. 90^0C and PH7.0 C. 5^0C and PH9.0 D. 37^0C and PH7.0
71. Where other conditions were to remain constant, which one of the following changes would explain a reduced rate of activity in an enzyme – controlled reaction? Increase in
    A. Concentration of end product C. enzyme concentration
    B. Substrate concentration D. temperature toward the optimum
72. Which of the following statements best describes an induced fit-model?
    A. An active site alters shape such that it is ready to accept a substrate.
    B. A substrate adopts the correct binding conformation before entering an active site.
    C. A substrate binds to an active site and alters the shape of the active site
    D. An active site alters the shape of the substrate such that it can adopt the necessary active conformation for binding.

Biology Grade – 11

Unit – 4

1. Lysosomes function in:
   A. Protein synthesis C. Intracellular digestion
   B. Processing and packaging D. Lipid synthesis
2. In which of the following organelles of the prokaryotic cell are enzyme synthesized?
   A. Nuclei B. Mitochondria C. Chloroplasts D. Ribosomes
3. Which one of the following is the part of a eukaryotic plant cell that is devoid of DNA?
   A. Nucleus B. Cytoplasmic fluid C. Chloroplast D. Mitochondrion
4. Which one of the following organelles of the cell is involved in the energy release of eukaryotic cells?
   A. Chloroplast B. Endoplasmic reticulum C. Nucleus D. Mitochondrion
5. Which one of the following terms refers to the diffusion of water across a selectively permeable membrane?
   A. Dialysis B. Osmosis C. Cohesion D. Cytoplasmic streaming
6. Which of the following are structurally and evolutionary more related to prokaryotic cells?
   A. Fungi and protozoa C. Chloroplasts and mitochondria
   B. Higher plants and animal D. Unicellular green algae and fungi
7. Select the kingdom of life in which the cellular organelles are without membranes around them?
   A. Plantae B. Protista C. Monera D. Fungi
8. What is the process by which water passes across the cell membrane?
   A. Active transport B. Osmosis C. Facilitated diffusion D. Pinocytosis
9. What would be the approximate image size of a cell with the size of 0.03 microns viewed under a compound microscope with magnification powers marked as 10X on the eye piece and 100X on the objective lenses?
   A. 10 microns B. 20 microns C. 30 microns D. 40 microns
10. When does a hypotonic condition exist in the environment of the cell?
    A. When there is equal concentration of solutes outside and inside the cell
    B. When the solute concentration outside the cell is higher than inside the cell
    C. When the solute concentration inside the cell is greater than outside the cell
    D. When the net movement of water is from the cell to the outside environment
11. Which of the following is important to regulate the entry and exit of materials into and out of plant cells?
    A. Cell wall B. Cell membrane C. Nucleus D. Central vacuole
12. All the living components of the cell collectively known as what?
    A. Cytoplasm B. Nucleus C. Cell membrane D. Protoplasm
13. Which of the following is found in both plant and animal cells?
    A. Cell wall B. Chromoplasts C. Chromosomes D. Leucoplasts
14. What happens to a human red blood cell when it is placed in a hypertonic solution?
    A. It becomes turgid C. it might lose water and shrink
    B. It might swell and burst D. It will remain unchanged
15. Which organelle of the cell has a function of modifying proteins for secretion?
    A. Goldi body B. Ribosome C. Food vacuole D. Lysosome
16. What is the process by which cells like amoeba and white blood cells engulf and internalize particles such as bacteria?

A. Osmosis B. Pinocytosis C. Active transport D. Phagocytosis

17. Among the following, which one can be an example of prokaryotic organisms?
    A. Paramecium B. Amoeba C. Liverwort D. Bacteria
18. If pieces of fresh potato are kept for some time in sugar solution of 20%, 10%, 5% and distilled water, which piece will gain the highest percentage of weight?
    A. The one in 20% solution C. the one in 5% solution
    B. The one in 10% solution D. The one in distilled water
19. Among the following scientists who contributed to the cell theory , identify the one who stated that " a cell can arise only from another cell like it"
    A. Robert Hooke B. Theodor Schwann C. Mathias Schneider D. Rudolf Virchow
20. Which is not true of prokaryotic? They:
    A. Are living cells C. All are parasitic
    B. Lack a true nucleus D. Are either archaebacteria or eubacteria
21. The cells of which group of micro-organisms can be described as prokaryotic?
    A. Viruses B. Protozoa C. Algae D. Bacteria
22. Which one of the following is largely made up of phospholipids
    A. Cell wall B. Cell membrane C. Nucleus D. Chromosomes
23. Choose the name of the researcher/scientist who introduced the term cell for the first time?
    A. Aristotle C. Robert Hooke
    B. Anton Van Leeuwenhoek D. Robert Brown
24. Which of the following is a process by which cells take in fluid by means of vesicles?
    A. Pinocytosis B. Endocytosis C. Osmosis D. Phagocytosis
25. Among the following discoveries in biology which one is the latest of all?
    A. The low of heredity C. The double helix nature of the DNA
    B. The cell theory D. The binomial system of classification
26. Which of the following organelles are likely to be more abundant inactive cells such as the muscle cells of human heart?
    A. Lysosomes B. Chromosomes C. Mitochondria D. Golgi bodies
27. Solution ions pass from a region where they are at lower concentrations to a region where they are found at higher concentrations inhuman cells. This is an example of which of the following processes?
    A. Osmosis B. Simple diffusion C. Passive transport D. Active transport
28. Choose the structure that is usually present only in the cells of animals?
    A. Vacuole B. Cell wall C. Nucleus D. Centriole
29. Who was the person that first observed living cells moving around when he examined drops of water under the microscope?
    A. Robert Brown B. Robert Hooke C. Anton van Leeuwenhoek D. Theodor Schwann
30. Why is it that the leaves and soft young stems of plants that have started wilting become stiff again when they are provided with water? This is because of:
    A. Fast intake of mineral C. Increased turgor pressure
    B. The cooling effect of water D. Increased rate of photosynthesis
31. In which kingdom of life are the unicellular eukaryotes grouped?
    A. Monera B. Proissta C. Plantae D. Anmalia
32. Which of the following statements is in agreement with the modern cell theory?
    A. Cells come from nothing C. .Cells come from existing cells

B. Cells come from non-living material D .Cells arise by means of spontaneous generation.

33. Which of the following ideas in cell theory was contributed by Rudolf Virchow?
    A. All plants are made up of cells C. All animals are made up of cells
    B. Cells are the structural unit of life. D. Cells come from pre-existing cells.
34. Which of the following modes of material transport across the cell membrane is **NOT** governed by the concentration gradient of the transported material?
    A. Simple diffusion B. Facilitated diffusion C. Osmosis D. Active transport
35. Which of the following require expenditure of ATP?
    A. Osmosis B. Facilitated diffusion C. Simple diffusion D. Endocytosis
36. Which means of particle transport requires input of energy by the cell?
    A. Simple diffusion B. Facilitated diffusion C. Osmosis D. Active transport
37. Suppose we consider four hypothetical cells (designated A, B, C and D) having cubic shape with their sides measuring 2, 4, 6 and 8 arbitrary units respectively which of these cells has the largest surface area to volume ratio?
    A. Cell A B. Cell B C. Cell C D. Cell D
38. Suppose three potato cylinders are kept for some time in 15%, 8% and 4% sucrose solutions, respectively, and the fourth cylinders is kept in distilled water, which of the cylinders will be more flaccid?
    A. The cylinder in 4% solution C. The cylinder in 8% solution
    B. The cylinder in 15% solution D. The cylinder in distilled water
39. What type of molecules cannot pass across the cell membrane by simple diffusion?
    A. Charged molecules C. Lipid soluble molecules
    B. Non-polar molecules D. Molecules of very small size.
40. Which of the following kingdoms of life is consisting of prokaryotic organisms?
    A. Fungi B. Monera C. Protista D. Plantae
41. Which one of the following is the main constituent of biological membranes?
    A. Phospholipids B. Glycoproteins C. Glycolipids D. Cholesterols
42. Which unit is best to use for measuring the smallest cells and organelles?
    A. Micrometer. B. Milliliter C. Millimetre D. Nanometre
43. If a suspension of a mixture of cellular of organelles is spun in a centrifuge, which organelle settles to the bottom first?
    A. Mitochondria B. Nuclei C. Chloroplasts D. Ribosomes
44. If the size of a cell increases, which one of the following gets smaller?
    A. The volume of the cell C. The surface area of the cell
    B. Surface area to volume ratio of the cell D. Volume to surface area ratio of the cell
45. Which of the following is an important function of the Golgi apparatus?
    A. Protein synthesis C. Packaging of proteins for export out of the cell.
    B. Removing of debris from cell D. Storage of waste materials not needed by the cell
46. In which of the following features are eukaryotic cells distinguished from prokaryotic cells?
    A. They have mitochondria C. Their nuclei lack membranes
    B. They have no DNA D. They have smaller ribosome
47. What will happen if human red blood cells are kept in a hypotonic solution?
    A. Lose water by osmosis and burst C. Lose water by osmosis and shrink
    B. Take in water by osmosis, swell and burst. D. Take in water by osmosis, swell and remain turgid.
48. In which type of solution is the water potential more negative than in the cells?

A. Hypotonic B. Hypertonic C. Isotonic D..Equal solute and solvent concentration

49. Which of the following paired organelles are membrane-bound?
    A. Ribosomes and peroxisomes C. Chloroplasts and ribosomes
    B. Mitochondria and ribosomes D. Chloroplasts and mitochondria
50. Most cell membranes are primarily composed of which compounds?
    A. Proteins and lipids B. DNA and ATP C. Chitin and starch D. Nucleotides and amino acids
51. If red blood cells shrink when placed in a certain solution, what is the strength of the solution relative to the strength of the protoplasm of the cells?
    A. Hypotonic B. Isotonic C. Hypertonic D. Isoosmotic
52. Which of the following cell types can be rich in lysosmes?
    A. Red blood cells B. Nerve cells C. Phagocytic cell D. Muscle cells
53. One of the following would be harder to see under the ordinary light microscope that is more likely to be available in school laboratories.
    A. Nucleus B. A bacterium C. A mitochondrion D. A ribosome
54. Which of the following cellular forms did Robert Hooke observe under his crude microscope?
    A. Bacteria B. Protozoa C. Yeast D. Empty cell wall
55. On which of the following organelles of the eukaryotic cell does protein synthesis take place?
    A. The nucleus B. The ribosome C. The chloroplast D. The mitochondrion
56. Which molecule in the cell is the constituent of the gene?
    A. Nucleic acid B. Protein C. Lipid D. Carbohydrate
57. Which of the following structures is **NOT** present in animal cells?
    A. Cell wall B. Nucleus C. Protoplasm D. Nucleic acid
58. Choose the organisms that belong to the eukaryotes?
    A. Bacteria B. Blue-green algae C. Amoeba C. Virus
59. What is the general term for the part of the protoplasm that lies outside the nucleus?
    A. Cytosol B. Cytoplasm C. Central vacuole D. Plasma membrane
60. Which of the following cellular structures is possessed by all cells?
    A. Cell membrane B. Nucleus C. Cell wall D. Golgi apparatus
61. Which of the following eukaryotic cell organelles was a free living cell before eukaryotic cells evolved?
    A. Nucleus B. Ribosome C. Chloroplast D. Nucleolus
62. Which of the following mechanisms moves digested amino acids and glucose across the plasma membrane of the cells lining the wall of the small intestine?
    A. Osmosis B. Simple diffusion C. Facilitated diffusion D. Active transport
63. If a cell fails to clear its cellular debris, which one of its organelles is most likely **NOT** functioning?
    A. Nucleus B.Mitochondria C. Endoplasmic reticulum D. Lysosomes
64. Among the following identify the organelle in which nucleic acid is **NOT** found?
    A. Mitochondria B. Chloroplast C. Ribosome D. Golgi apparatus
65. Suppose a hypothetical cube-shaped cell has sides of 10 micrometers, what is the surface area to volume ratio of this cell?
    A. 6 : 10 B. 10 : 10 C. 3 : 6 D. 4 : 8
66. In which of the following solutions does an animal cell undergo haemolysis?
    A. In hypotonic solution C. In hypertonic solution
    B. In isotonic solution D. In both hypotonic & hypertonic solutions
67. Which of the following will happen if a plant cell is kept in a solution that is stronger than its protoplasm?

A. The cell will become turgid C. The central vacuole will expand
B. The protoplasm will get plasmolysed D. The cell will swell and burst

68. Which of the following units of measurement is more c0nvenient to express the size of cellular organelles?
A. Meter B. Centimeter C. Millimeter D. Micrometer

69. Which of the biologist is more frequently is used to study cell structure in laboratory?
A. Dissecting kit B. Centrifuge D. Petri- dish D. Microscope

70. What does it mean when biologists express the cell membrane as a unit membrane?
A. A cell is covered by a single membrane C. A membrane is only one lipid layer thick
B. B. All cells have essentially similar membrane D. A membrane is covered by a single layer of protein

71. Which of the following classes of molecules **CANNOT** pass easily across the cell membrane by simple diffusion?
A. Small non-polar molecules C. Lipid soluble molecules
B. B. Non- polar molecules D. Polar molecules

72. Which the following modes of transport is used by cells to move substances against their concentration gradients?
A. Osmosis B. Simple diffusion C. Facilitated diffusion D. Active transport

73. Which one of the following factors determines the rate at which organelles settle out of cell homogenate if span in centrifuge ?
A. Mass of the organelle C. Function of organelle in the cell
B. Location of the organelle in the cell D. Thickness of the membrane covering the organelle

74. Of the following four cells whose surface area to volume ratio is given , which cell can more efficiently transport its needs of material across the surface
A. 24 : 8 ratio B. 54 : 27 ratio C. 96 : 64 ratio D. 150 : 125 ratio

75. What is the best term that expresses the movement of substances in cells against their concentration gradients?
A. Active transport B. Passive transport C. Osmosis D. Diffusion

76. Which of the following has a bigger size than all the others?
A. A ribosome taken from animal cell C. A mitochondria taken from a plant cell
B. A nerve cell taken from a human brain D. A glucose molecule taken from a plant cell.

77. Which of the following parts of the plant cell is NOT a living component of the cell?
A. Cell membrane B. Cell wall C. Cytoplasm D. Nucleus

78. If two species are known to belong to the same order ,they must also belong to which taxonomic category?
A. Class B. Family C. Species D. Genus

79. Which of the following mechanisms of cellular transportation depends only on the kinetic movement of the transported substances?
A. Simple diffusion B. Facilitated diffusion C. Active transport D. Phagocytosis

80. What would happen to relative size of surface area and volume as the cell size increase?
A. Both increase at same rate C. The volume increase faster
B. The surface area increase faster D. As volume increases surface area decreases

81. Which of the following liquid media would cause plasmolysis if plant cells are kept in it?
A. Distilled water B. Hypotonic solution C. Hypertonic solution D. Isotonic solution

82. In which of the following alternatives do both organelles have double membranes?
A. Peroxisomes and lysosomes C. Chloroplasts and lysosomes

B. Ribosomes & mitochonderia D. Mitochondria and chloroplasts

83. Which of the following is correct according to the cell theory?
    A. All organisms are made up of one cell
    B. Cells are built spontaneously from organic molecules
    C. Only the higher multicellular organisms are made up of cells
    D. Cells are the structural and functional units of all living things
84. Which one of the following do all prokaryotic cells have?
    A. Cell wall B. Chloroplast C. Nuclear envelop D. Mitochondrion
85. Why is the surface -area -to-volume ratio of a cell important?
    A. It measures cell′s efficiency in obtaining the oxygen it needs
    B. It measures how efficient the cell is in conserving energy
    C. It measures how efficiently the cell uses the energy it releases
    D. It measures how efficiently the cell releases energy in respiration
86. Which of the following is true about cells kept in different solution?
    A. Plant cell in hypertonic solution swell C. Plant cells in hypotonic solution become turgid
    B. Red blood cells in hypotonic solution shrink D. Red blood cells in hypertonic solution haemolyse
87. Which one of the following is the smallest of all?
    A. A red blood cell B. A virus C. A bacterium D. An amoeba
88. In which of the following groups of living organisms do the cells lack organized nuclei?
    A. Fungi B. Protozoa C. Bacteria D. Algae
89. Which one of the following events happened before all the others ?
    A. The cell theory was proposed C. The protozoa were discovered
    B. The compound microscope was invented D. The structure of DNA was described
90. Which of the following is lacking in prokaryotic cells?
    A. Cellulose B. Ribosome C. DNA strand D. Cytosol
91. Cells were first seen using the microscope by:
    A. Schleiden B. Leeuwenhoek C. Schwann D. Robert Hooke
92. Who was the first person who believed to have seen live moving cells under a microscope?
    A. Robert Hooke C. Theodor Schwann
    B. Rene Dutrochet D. Anton van Leeuwenhoek
93. Through which process can inorganic ions from the soil be absorbed into the root hairs?
    A. Dehydration B. Active transport C. Diffusion D. Osmosis
94. The organelle of the cell which is concerned with the synthesis of lipids in addition to being associated with carbohydrate metabolism and detoxification is:
    A. Golgi body C. smooth endoplasmic reticulum
    B. Thylakoid membrane D. rough endoplasmic reticulum
95. Which of the following is NOT a requirement for a molecule to direct diffuse across the cell membrane?
    A. Small size B. Non-polar C. lipid soluble D. large size and polarity
96. Which of the following organelles settles out last when homogenized cells are centrifuged?
    A. Chloroplast B. Ribosome C. Mitochondria D. Nucleus
97. Cell organelles that contain hydrolytic enzymes are called:
    A. Peroxisomes B. mesosomes C. lysosomes D. ribosomes
98. Which part of the cell makes necessary changes, packages and secretes proteins?
    A. Mitochondria B. Golgi apparatus C. endoplasmic reticulum D. cell wall

99. Of the following models describing the nature of the cell membrane, which one was proposed before all the others?
    A. The sandwich model C. the unit membrane model
    B. Phospholipid bilayer D. fluid mosaic model
100. Which of the following molecules is known as the energy currency of the cell?
    A. Glucose B. Starch C. Fat D. ATP
101. If a homogenate of eukaryotic cells is spun in a centrifuge, which of the cellular organelles settles out first?
    A. Nucleus B. Ribosomes C. Chloroplast D. Mitochondria
102. If the average diameter of the human red blood cell is 0.000007m, which one is its correct diameter when expressed in a smaller unit?
    A. 0.00007μm. B. 0.007μm C. 7mm D. 7000nm
103. Which procedure allows biologists to separate different cellular organelles and study their structures and compositions separately?
    A. Dehydrogenation B. cell fractionation C. phosphorylation D. Polymeryzation
104. Organelles in the cytoplasm that are known as ‘power house’ of the cell are:
    A. Mitochondria B. Chloroplast C. Ribosome D. Cellulose
105. Which of the following is NOT the function of lysosomes?
    A. Autophagy B. Autolysis C. Digestion D. Synthesis
106. Which of the following has the highest water potential than all the other?
    A. Animal cells B. different solution C. pure liquid water D. different suspension

Biology Grade – 11

Unit – 5

1. Which molecule in plaint cells first captures the energy from sunlight during photosynthesis?
   A. Adenosinetriphosphate B. Chlorophyll C. Carbon dioxide D. Glucose
2. Which one of the following alternatives gives the products of fermentation of glucose by yeast?
   A. Lactic acid, CO2, 2ATP C. Alcohol, CO2, 2ATP
   B. CO2, H2O, 36ATP D. Alcohol, CO2, 36ATP
3. If a cell contains 10NADH + 10 $FADH_2$ molecules, a total of how many ATP molecules would it produce from them?
   A. 20 ATP B. 30 ATP C. 50 ATP D. 60 ATP
4. Which of these is not true of fermentation?
   A. Net gain of only two ATP C. NADH donated electrons to electron transport system
   B. Occurs in cystol D. Begins with glucose
5. Which one of the following compounds contains more energy
   A. $FADh_2$ B. Pyruvic acid C. NADH D. ATP
6. Which one of the following is the correct sequence for the main processes of cellular respiration?
   A. Krebs cycle, electron transport system, glycolysis
   B. Glycolysis, Krebs cycle, electron transport system
   C. Electron transport system, Glycolysis, Krebs cycle
   D. Glycolysis, Electron transport system, Krebs cycle
7. Which of the following is the most important pigment for photosynthesis?
   A. Chlorophyll a B. Chlorophyll b C. Carotenoids D. Xanthophylls
8. The greatest contributor of electrons to the electron transport system is:
   A. Oxygen B. The Krebs cycle C. The transition reaction D. Glycolysis
9. Which of the following processes releases oxygen to the atmosphere?
   A. Respiration B. Photosynthesis C. Transpiration D. Burning of fossil fuels
10. What is the source of the oxygen that green plants relese during photosynthesis
    A. Sugar B. Carbon dioxide C. water D. Chlorophyll
11. Choose the final electron acceptor in eh electron transport chain during aerobic respiration of eukaryotic cells?
    A. H_2O B. O_2 C. CO_2 D. NADP
12. Where in the plant cell does the Krebs cycle (citric acid cycle) take place?
    A. Nucleus B. Cytoplasm C. Mitochondrion D. Chloroplast
13. Which of the following is true about the first stage of photosynthesis?
    A. Light dependent B. Temperature dependent C. ATP driven D. Glucose driven
14. To which of the following molecules is most of the energy released during the Krebs cycle transferred?
    A. ATP B. $FADH_2$ C. NADH D. ADP
15. Where in the mitochondria does the Krebs cycle take place?
    A. On the cristae C. In the matrix
    B. Between the outer and inner membrane D. On the inner surface of the outer membrane
16. Which of the following defines ATP?
    A. Adenine + adenosine + a phosphate C. Adenosine + ribose sugar + double phosphate
    B. Adenine+ ribose sugar + triple phosphate D. Nitrogen + sugar + monophosphate

17. Which process of respiration helps to release most of the energy stored in glucose?
    A. Oxidative phosphorylation C. Fermentation reaction
    B. Glycolysis D. Anaerobic reaction
18. If an animal inhales a radioactive form of oxygen, in which of the following products of the cellular respiration would the radioactivity be detected?
    A. Water B. Carbon dioxide C. ATP D. NADH
19. Which of the following steps in cellular respiration can take place in the absence of oxygen?
    A. Electron transport B. Glycolysis C. Krebs cycle D. Acetyl COA formation
20. In aerobic respiration of cells, in which cellular part does the krebs cycle (citric acid cycle) take place?
    A. Chloroplasts B. Mitochondria C. Nuclei D. Lysosomes
21. What is the final electron acceptor in the electron transport chain of cellular respiration?
    A. H_2 B. O_2 C. $NADP^+$ D. NAD^+
22. Which of the following pairs are both organelles concerned with energy transformation?
    A. Nucleus and nucleolus C. Chloroplast and vacuole
    B. Mitochondria and nucleus D. Chloroplast and mitochondria
23. When the muscle cells are in short supply of oxygen, which of the following compounds would be accumulated in them?
    A. Ethanol B. Acetic acid C. Lactic acid D. Carbon dioxide
24. Which of the following processes of photosynthesis does **NOT** require the presence of light to take place?
    A. The splitting of water B. ATP formation C. Reduction of NADP. D. Carbon fixation.
25. What amount of net gain ATP does glycolysis provide to a cell?
    A. 2 ATP molecules. B. 4 ATP molecules C. 18 ATP molecules. D. 36 ATP molecules.
26. What is the correct equation for cellular respiration?
    A. $6CO_2 + 6H_2O + Energy = 6O_2 + C_6H_{12}O_6$
    B. $6O_2 + C_6H_{12}O_6 = 6CO_2 + 6H_2O + Energy$
    C. $6O_2 + C_6H_{12}O_6 + Energy = 6CO_2 + 6H_2O$
    D. $6CO_2 + 6H_2O = 6O_2 + C_6H_{12}O_6 + Energy$
27. Which of the following is **NOT** one of the stages in cellular respiration?
    A. Calvin cycle B. Glycolysis C. Electron transport D. Krebs cycle
28. Which of the following is true for cellular respiration?
    A. Restricted to plant cells C. Restricted to animal cells
    B. Occurs in all eukaryotic cells D. Occurs in prokaryotic cells only
29. How many moles of ATP will be generated as a result of the oxidation of one mole of $FADH_2$ in an actively respiring mitochondrion?
    A. 0 B. 3 C. 2 D. 6
30. In cyclic photophosphorilation what is the source of the recycled electron?
    A. Reduced NADP C. Chlorophyll molecule
    B. Adenosine triphosphate. D. Photolysis of water molecule
31. If there were no free oxygen to breath, which one of the following steps of the respiration process can operate in our body?
    A. Glycolysis B. Electron transport chain C. Krebs cycle D. link reaction
32. What is the source of the oxygen that is produced during the process of photosynthesis by higher plants?
    A. CO_2 B. H_2O C. ATP D. Chlorophyll
33. Which energy rich organic compound contains adenine in its molecule?

A. Lipid B. Carbohydrate C. Glucose D. ATP

34. During chemiosmosis, what substance diffuses from one side to the other side of the membrane?
    A. Water molecules B. Protons C. Electrons D. ATP molecules
35. Which of the following is **NOT** true about photosystem-II?
    A. Its reaction center molecule is P680.
    B. It passes is excited electrons to Photosystem-I.
    C. The energy lost from its excited electrons reduces NADP.
    D. It replenishes its lost electrons from photolysis of water
36. What is the importance of chemiosmosis in photosynthesis and cellular respiration?
    A. Splitting of water molecule C. Operating the proton pump
    B. Combining hydrogen and carbon D. Synthesizing ATP
37. Where does the light dependent reaction of photosynthesis occur in the chloroplast?
    A. In the thylakoid membrane C. In the fluid of the stroma
    B. In all parts of the chloroplast B. In the stomatal opening
38. For which of the following is the sugar produced by photosynthesis **NOT** used?
    A. To produce biomass C. To make new DNA
    B. To produce ATP in respiration D. To produce enzaymes
39. In which process is ATP generated during short distance high speed running?
    A. Aerobic respiration C. Mitochondrial energy transformation
    B. Anaerobic respiration D. The Krebs cycle
40. How many net ATP molecules are generated through anaerobic respiration, when a single glucose molecule is changed to pyruvate in the human body?
    A. Two B. Three C. Four D. Six
41. During the Krebs cycle, which of the following molecules temporarily stores most of the energy released from food molecule?
    A. ADP B. ATP C. NADH D. FADH
42. At which stage is most of the ATP generated in aerobic respiration?
    A. Glycolysis B. Link reaction C. Krebs cycle D. Electron transport
43. Which of the following substances is **NOT** necessary for photosynthesis to take place?
    A. Chlorophyll B. Carbon dioxide C. Oxygen D. Water
44. The molecule of which pigment is located at the reaction center of photosynthesis?
    A. Chlorophyll a B. Chlorophyll b C. Carotenoid D. Accessory pigments
45. Where exactly in the cell does the Krebs cycle take place?
    A. Inner mitochondrial matrix C. Inner mitochondrial membrane
    B. Cytoplasmic fluid D. Outer mitochondrial membrane
46. If present in the fermentation system, which one of the following would negatively affect alcohol production by yeasts?
    A. Water B. Oxygen C. Glucose D. Fermentation enzyme
47. In which of the following ways is the carbon dioxide of the atmosphere fixed into the carbon found in organic molecules?
    A. In the decomposition of organic molecules C. In the process of photosynthesis by green plants
    B. In all the cellular respiration processes of organisms? D. In the breathing processes of all animals
48. Which of the following groups of plants carry out lightdependent and light independent reactions of photosynthesis in separate cells?

A. C-3 plants B. C-4 plant C. CAM plant D. Plants without chlorophyll

49. From which of the processes of cellular respiration is the majority of the ATP generated?
    A. Anaerobic fermentation C. Glycolysis & link reaction
    B. Electron transport & chemiosmosis D. Krebs cycle & glycolysis
50. On which of the following does the rate of algal photosynthesis in a lake depend?
    A. The oxygen content of the water C. The nitrogen content of the water
    B. The elevation where the lake is found D. The amount of light that penetrates the lake water
51. During aerobic respiration, what is the route through which protons return from the mitochondrial inter-membrane space back to its matrix?
    A. Proton pump B. ATP synthase C. Ion channel D. Membrane lipid
52. What is molecule that supplies the quickest and suitable source of energy to cells ?
    A. Lactose B.Sucrose C. ATP D. Lipid
53. Which of the following is **NOT** true about mitochondria and chloroplast?
    A. Both contain chlorophyll C. Both contain nucleic acid
    B. Both have double membrane D. Both transduce energy
54. From where do plants get most of their nutrients
    A. Chlorophyll B. Soil C. Light D. Atmosphere
55. When athletes take part in short distance running, how do the cells generate most of energy that is quickly needed?
    A. Aerobic respiration in muscle clls C. Mitochondrial respiration in any cells
    B. Anaerobic respiration in muscle cells D. Yeast fermentation in the stomach
56. Which of the following happens in both cycle and non-cyclic photophosphorilation?
    A. ATP is formed B. Oxygen is generated C. NADP is reduced D. Water molecule splits
57. Which of the following is NOT true about C4 plants such as tef (Eragrostis tef)?
    A. CO_2 is harvested during the night time
    B. Light - dependent reaction occurs in mesophyll cells
    C. The bundle sheath cells contain chloroplast
    D. Chloroplast of bundle sheath cells lack thylakoids
58. Of the following, which one is the main source from which plants get nutrients necessary for their growth and development?
    A. Light B. Chlorophyll C. Atmosphere D. Soil
59. From which of the following does the O_2 released during the process of photosynthesis originates?
    A. Pyruvic acid B. CO_2 C. Sugar D. Water
60. What happens in the first reaction of the Kerbs cycle during energy transformation?
    A. A 2-C compound is produced C. A 6-C compound is produced
    B. A 4-C compound is produced D. A 5-C compound is produced
61. In the carbon cycle, which of the following processes removes carbon dioxide from atmosphere?
    A. Respiration B. Decomposition C. Combustion D. Photosynthesis
62. Which of the following processes release CO_2 in to the atmosphere?
    A. Respiration B. Assimilation C. Feeding D. Photosynthesis'
63. During which of the following processes in cellular respiration are most of the ATPs formed?
    A. Glycolysis B. Chromosome C. Link reaction D. Kerbs cycle
64. Which of the following is the adaptation by C4 plants that help them to avoid photosynthesis?
    A. Harvesting of carbon dioxide at night C. Using separate cells for light and dark reactions

B. Storing carbon dioxide in the vacuole D. Keeping the stomata closed during the day

65. Which phosphate bond of the ATP is broken when the energy it contains is needed for cellular activity?
A. The first bond B. The C- C bonds C. The second bond D. The third bond

66. What is the advantage that a photo system containing molecules of different types of light sensitive pigments have?
A. To absorb light of different wave lengths C. To increase the site of photosystem
B. To increase the complexity of the photosystem D. To increase the surface area for light absorption

67. Which of the following is responsible for the bending of a young plant toward a unidirectional souce of light?
A. Reduced photosynthesis on dark side C. Faster growth rate on the dark side
B. Reduced auxin concentration on the dark side D. Increased rate of drugs cell division on the light side

68. Under what conditions do C4 plants have more photosynthetic efficiency than C3 plants?
A. Low water supply B. Low temperature C. Low light intensity D. Low CO_2 concentration

69. Which of the following processes release energy that is used by the cell in its ATP synthesis ?
A. Oxidation of glucose C. Synthesis of macromolecules
B. Conduction of nerve impulses D. Protein synthesis from amino acids

70. Which of the four stages of aerobic respiration of glucose takes place outside the mitochondria?
A. The Kerbs cycle B. Glycolysis C. Electron transport chain D. The link reaction

71. One of the following is NOT part of the light reaction of photosynthesis . Which is it?
A. Photosystem I B. Photosystem II C. Electron carrier D. Calvin cycle

72. From where do plants get the phosphates that they use in the synthesis of ATP?
A. Air B. Heat C. Soil D. Sun

73. Which of the following plants has the photosynthetic pathway known as CAM?
A. Mango B. Maize C. Sugarcane D. Pineapple

74. To which of the following classes of molecules is ATP more related chemically?
A. Nucleotides B. Disaccharides C. Lipids D. Phospholipids

75. Commercial crop growers increase the CO_2 concentration and the temperature (up to a certain limit) to increase the rate of photosynthesis and crop yield in glass house production. To which of the following is this action best related? understanding of ----------
A. soil nutrient requirement in crop production
B. limiting factors in plant growth and crop production
C. fluctuations in the amount of available nitrogen and oxygen
D. market factors and relations in commercial crop production

76. In athletics, why should long distance races be made at slower speed than short distance running?
A. To allow aerobic respiration produce the ATP needed
B. To generate more ATP over very short period of time
C. To generate sufficient ATP through anaerobic respiration
D. To produce more lactic and ATP and avoid muscle fatigue

77. What do yeasts primarily achieve for their survival from the process of converting pyruvic acid to alcohol during anaerobic respiration? They -----
A. Form ATP B. recycle NAD C. produce oxygen D. release carbon dioxide

78. What does the complete aerobic respiration of glucose by cells normally yields?
A. Alcohol, CO_2 , and 36 ATP C. CO_2 , H_2O , and 36 ATP
B. Alcohol, CO_2 and 2 ATP D. Lactic acid, CO_2 and 2 ATP

79. Which of the following stages of aerobic respiration occurs outside mitochondria ?
A. Glycolysis B. Chemiosmosis C. Kerbs cycle D. Link-reaction

80. Which process of photosynthesis can occur in the presence as well as in the absence of light?
A. Photolysis of water B. ATP formation C. Carbon fixation D. Release of free oxygen

81. Which of the following happens during cellular respiration but **NOT** during photosynthesis ?
A. Fixation of carbon dioxide C. Release of carbon dioxide
B. Release of free oxygen D. Formation of ATP

82. What does the fermentation of glucose by yeast normally yield?
A. Lactic acid ,CO_2, and 2ATP C. CO_2,H2O,and 36 ATP
B. Alcohol, CO_2,and 2ATP D. Alcohol,CO_2 ,and 36ATP

83. At which stage is most of the carbon dioxide released during aerobic respiration?
A. Glycolysis B. Chemiosmosis C. Krebs cycle D. Electron transport

84. One of the following groups of plant carry out light dependent and light independent reaction of photosynthesis in separate cells of the leaf.
A. C-4 plants B. C-3 plants C. plants adapted to temperate region D. Cacti

85. Among the following crops, which one uses a non-C4 photosynthetic pathway?
A. Pineapple B. sorghum C. maize D. sugarcane

86. Where is the convergence point for the metabolism of the building blocks of carbohydrates, lipids and proteins?
A. Cytoplasm B. Electron transport C. Calvin cycle D. Krebs cycle

87. During photosynthesis, which of the following is the first step in the transduction of light energy to chemical energy?
A. Carbon fixation B. photolysis of water C. ATP formation D. glucose formation

88. Which of the following molecules can provide the cell the least amount of energy per molecule?
A. Reduced FAD B. reduced NAD C. ATP D. Glucose

89. In the process of photosynthesis light is necessary to:
A. Produce ATP and a reducing substances C. release energy
B. Split carbondioxide D. combine CO_2 and H_2O

90. Which of the following takes place under normal conditions, as electrons flow down the electron transport chain of the mitochondria?
A. NADH and $FADH_2$ are oxidized C. the PH of the matrix increases
B. An electrochemical gradient is formed D. the electrons lose tree energy

91. Why it is that longer race by athletes must be run slower than shorter races?
A. To allow aerobic respiration to produce the required ATP.
B. To give time for lactic acid fermentation in muscles cells.
C. To avoid hunger as food is quickly converted to energy.
D. To adapt to the weather conditions at the racing place.

92. In which industrial product is pyruvate fermentation by yeast practically applied?
A. Brewing beer B. Swiss cheese making C. Production of vinegar D. Yoghurt making

93. Cells immediately use the energy that electrons lose as they pass along the chain of electro carriers to:
A. produce ATP B. pump protons C. spin rotor of ATP synthase D. reduce NAD

94. What is the purpose of the enfolding of the -membrane of the mitochondria?
A. Increasing the photosynthetic capacity of cell
B. Speeding up the loss of CO_2 during fermentation

C. Speeding up the process of glycolysis
D. Increasing the surface area for ATP production

95. What is the molecule in plant cell that first captures the radiant energy from sunlight?
A. ATP B. DNA C. Chlorophyll D. Carbon dioxide

96. What does the fermentation of glucose by yeast normally yield?
A. Lactic acid ,CO_2, and 2ATP
B. Alcohol, CO_2,and 2ATP
C. CO_2,H2O,and 36 ATP
D. Alcohol,CO_2 ,and 36ATP

97. Which of the following substances is NOT formed when glucose is fermented by yeast?
A. Alcohol B. ATP C. Lactic acid D. Carbon dioxide

98. Respiration is:
A. Anabolic and exergonic
B. Anabolic and endergonic
C. Catabolic and exergonic
D. Catanolic and endergonic

99. In which part of mitochondria does the Kreb's cycles take place?
A. In the matrix
B. On the inner membrane surface
C. On the outer membrane surface
D. in the inter-membrane space

100. What is the ultimate source of the electrons that replace those lost from the photosystem II during photosynthesis?
A. Photosystem I B. Chlorophyll-b C. Chlorophy D. Water

101. How many ATP molecules are produced during the complete cellular respiration of one glucose molecule?
A. 2 B. 4 C. 18 D.36

102. The complete steps for complete aerobic respiration are:
A. Glycolysis and Oxidative phosphorylation
B. Glycolysis and Krebs cycle
C. Glycolysis, Krebs cycle and terminal oxidation
D. Krebs cycle and terminal oxidation

103. Which of the following processes indicate the process of photosynthesis?
A. Reductive, exorgonic and catabolic
B. Reductive, exorgonic and anabolic
C. Reductive, indorgonic and catabolic
D. Reductive, edorgonic and anabolic

104. Which of the four stages in aerobic respiration of glucose does NOT produce ATP?
A. Glycolysis B. the link reaction C. Kerbs cycle D. ET and chemiosmosis

105. In an experiment to study photosynthesis, a plant was provided with radioactive carbon dioxide as a metabolic tracer and the radioactive carbon was incorporated first in to oxaloacetate. Which one of the following would best characterised this plant?
A. C3 plant B. C4 plant C. CAM plant D. Heterotrophic plant

106. Which one is first inhibited if a cell contains excess of ATP?
A. Krebs cycle B. Oxidative phosphorylation C. Glycolysis D. electron transport

107. Which of the following results in the production of oxygen during photosynthesis?
A. Reducing NADP+
B. Splitting of the water molecules
C. Electron transfer system of photosystem II
D. Electron transfer system of photosystem I