SET A

1. Which of the following hydrocarbon has the shortest C-C bond length?
   A. $CH_2=CH_2$
   B. CH_3-CH_3
   C. $CH\equiv CH$
   D. Benzene

2. Compound in which carbons use only sp3 hybrid orbitals for bond formation is:
   A. $CH_3-CH_2-CH_3$
   B. $CH_3-C\equiv CH$
   C. $CH_3-CH=CH_2$
   D. $CH_2=CH-CH=CH_2$

3. Which molecule has the greatest dipole moment?
   A. CH_3Cl
   B. CH_3Br
   C. CH_3F
   D. CH_3I

4. What is the name of chemical reaction which catalyses the cleavage of peptide bond?
   A. Oxidation
   B. Reduction
   C. Dehydration
   D. Hydrolysis

5. Inheritance pattern of RAPD is _____
   A. Dominant
   B. Recessive
   C. Codominant
   D. Random

6. The digestion of mRNA during RT-PCR is carried out by the enzyme____
   A. Exonuclease
   B. RNase H
   C. Bal 31
   D. Endonuclease

7. Who proposed the binomial nomenclature of organisms
   A. John Ray
   B. Lamarck
   C. Linnaeus
   D. Darwin

8. Which phylum has a true coelom?
   A. Coelenterata
   B. Porifera
   C. Annelida
   D. Protozoa

9. Which kind of symmetry occurs in sea anemone?
   A. Radial
   B. Bilateral
   C. Assymetry
   D. None

10. Cold blooded animals are
   A. Have cold blood
   B. Who feel cold a lot
   C. Who cannot regulate body temperature
   D. Who can regulate body temperature

11. Which of the amino acid has the greatest number of codons____
   A. Proline
   B. Leucine
   C. Tryptophan
   D. Aspartic acid

12. Genetically engineered male sterile plants may be produce by inserting_____
   A. BT toxin gene
   B. Lectin gene
   C. Barnase gene
   D. Chitinase gene

13. Which of the following genes is defective in patients which suffering from severe combined immunodeficiency syndrome (SCID)
   A. CFTR
   B. Adenosine deaminase
   C. Ribonucleotide reductase
   D. α_2-microglobulin

14. Taxonomically a species is
   A. A group of evolutionary related populations
   B. Group of organisms capable of interbreeding
   C. Category to which most taxonomic information is attached
   D. Group of organisms living in forest

15. Bile contribution to digestion is
    A. Nucleic acid metabolism
    B. Phagocytosis
    C. Emulsification of lipids
    D. Carbohydrate digestion

16. Hormone that stimulates the secretion of gastric juice
    A. Gastrin
    B. Rennin
    C. Enterokinase
    D. Insulin

17. YAC vectors can accommodate foreign DNA fragment upto
    A. 50 kbp
    B. 200 kbp
    C. 100 kbp
    D. 500 kbp

18. *Pfu* DNA polymerase is preferred over *Tgo* DNA polymerase, because it shows
    A. 5'-3' exonuclease activity
    B. 3'-5' exonuclease activity
    C. less error rate per base pair
    D. requires high concentration of $MgCl_2$

19. The enzyme nitrogenase is a complex of
    A. iron and molybdenum
    B. iron, molybdenum and protein
    C. molybdenum and protein
    D. iron and protein

20. Human vertebral column have
    A. 30 vertebrae
    B. 33 vertebrae
    C. 29 vertebrae
    D. 28 vertebrae

21. Which phylum has most number of species in the world
    A. Arthropoda
    B. Protozoa
    C. Mollusc
    D. Annelida

22. Darwin's finches are an excellent example of
A. Connecting links
B. Seasonal migration
C. Adaptive radiation .
D. Parasitism

23. Analogous organs are
A. Anatomically and functionally similar .
B. Anatomically similar but performing different functions
C. Anatomically different but performing similar functions
D. Anatomically and functionally different

24. Leghaemoglobin present in legume root nodules. Its function is to regulate
A. *nif* gene expression
B. oxygen supply
C. dinitrogenase activity
D. nodule growth .

25. How many ATP are required for the conversion of one N_2 to $2NH_4^+$ during biological nitrogen fixation?
A. 8 ATP
B. 10 ATP
C. 12 ATP
D. 16 ATP

26. Which of the following is not part of the triple response of etiolated pea seedling to ethylene?
A. Stunted growth
B. Increased radial expansion of cells of the stem
C. Loss of gravity perception
D. Unfolding of the apical hook of the seedling

27. Which of the following statement is correct?
A. Blue light causes phototropism
B. Auxin movement is non-polar
C. TIBA is not an anti-auxin substance
D. ABA is transported only through phloem

28. In anoxygenic photosynthesis, the green and purple bacteria do not use the following one as electron source
A. H_2O
B. H_2S
C. H_2
D. S (elemental sulphur)

29. Photosynthetic yield will be more in
A. continuous red light
B. continuous blue light
C. intermittent white light
D. green light

30. The first carboxylation product of a C_3 plant is
A. Phosphoglyceric acid
B. Oxaloacetic acid
C. Malic acid
D. Phosphoglyceraldehyde

31. Inhibition of photosynthesis in the presence of O_2 in C_3 plants is called
A. Pasteur effect
B. Warburg effect
C. Decker effect
D. Hexose monophosphate shunt

32. Which of the following is not true about autosomal dominant traits
A. Every affected person should have at least one affected parent
B. Males and females should be often equally affected
C. An affected person has a 50% chance of transmitting the dominant allele to each offspring
D. All the daughters of an affected male will be affected but none of the sons

33. Which one of the following belongs to platyhelminths?
A. Amoeba
B. Leech
C. Fasciola
D. Sponge

34. Which one of the following is oviparous?
A. Platypus
B. Elephant
C. Human
D. Whale

35. Cysticercus stage is found in
A. Tape worm
B. Plasmodium
C. Earthworm
D. Insect

36. If ^{32}P-labeled inorganic phosphate were introduced to RBCs undergoing glycolysis then which of the following glycolytic intermediate would be radiolabelled?
A. Fructose-1, 6-bisphosphate
B. 1, 3-bisphosphoglycerate
C. Glyceraldehyde-3-phoshate
D. Glucose-6-phoshate

37. Fluoride is an inhibitor of glycolysis. It inhibits glycolytic enzyme
A. Phosphofructokinase
B. Glucokinase
C. Enolase
D. Lactate dehydrogenase

38. Which of the following statement is incorrect?
A. During fermentation final electron acceptor is organic compound
B. Cardiophilin reduces the permeability of inner mitochondrial membrane to proton
C. Malate-aspartate shuttle results in the formation of 32 ATP during aerobic respiration
D. PFK-2 catalyses the formation of fructose 1, 6 bisphosphate

39. Which apparatus is used to study the rate of transpiration_____
A. Porometer
B. Perimeter
C. Potometer
D. Evaporimeter

40. As per concept of classical systematics, species is_____
A. Dynamic
B. Variable
C. Static
D. Mutable

41. A group of genera showing general resemblances of morpho-floral characters may be called as
A. Species
B. Tribe
C. Genus
D. Varieties

42. When all possible morphological characters are considered in a classification, it is termed as
A. Natural system
B. Sexual system
C. Artificial system
D. Phylogenetic system

43. Open circulatory system is found in
A. annelids and molluscs
B. arthopodes and annelids
C. molluses and arthopodes
D. annelids and nematodes

44. Body temperature is controlled by
A. corpus callosum
B. hypothalamus
C. cerebellum
D. diencephalon

45. The large fat globules are emulsified by bile salts in
A. stomach
B. large intestine
C. duodenum
D. small intestine

46. Smallest known cell is
A. *Acetabularia*
B. virus
C. *Pleuroneumonia*
D. *Chlamydomonas*

47. Amino acid with carbon rich side chains, like leucine and phenylalanine, are usually placed in protein folding_____
A. On the surface of the protein
B. Inside the protein
C. Near positively charged residues
D. Near polar residues

48. Plant tissue culture technique used to produce secondary metabolites is
A. micropropagation
B. organ culture
C. cell suspention culture
D. embryo culture

49. Homopolymer tailing can be done in DNA using
A. mungbean nuclease
B. terminal deoxynucleotidyl transferase
C. S1 nuclease
D. klenow enzyme

50. Pantothenate is the precursor of
A. biocytin
B. flavin coenzyme
C. nicotinamide coenzyme
D. coenzyme A

51. *Avena* coleoptile curvature test is used to characterize
A. Nepthlene Acetic Acid
B. Indole Acetic Acid
C. 2, 4 Di chloro Acetic Acid
D. 2, 4, 6 Tri chloro phenoxy Acetic Acid

52. The group of mammals in which embryo completes development in pouch on mother is
A. rodentia
B. chiroptera
C. primates
D. marsupialia

53. A 0.1 M solution has a water potential of _____
A. 2.3 bars
B. – 2.3 bars
C. 22.4 bars
D. 0 bars

54. Epithem tissues are associated with____
A. Transpiration
B. Guttation
C. Exudation
D. Absorption

55. The closure of stomata is affected by___
A. Cytokinin
B. GA
C. ABA
D. IAA

56. Water potential_____
A. of a solution is always greater than for pure water
B. is the potential energy of water in a system
C. is a measure of the level of the active movement of the water through a system
D. is never zero.

57. Which of the following proteins have not been used in genome editing_____
A. ZFN
B. TALLENs
C. CRISPR-Cas9
D. MHC

58. Nucleosome is made up of_____
A. Histone core proteins
B. Histone core protein and linker H1
C. DNA, Histone core protein and linker H1
D. DNA, RNA, Histone core protein and linker H1

59. Which of the following amino acid contains imidazole ring_____
A. Proline (Pro)
B. Tyrosine (Tyr)
C. Tryptophan (Trp)
D. Histidine (His)

60. What feature of an energy diagram reveals whether the reaction is endothermic or exothermic?
A. the height of the transition state
B. the number of transition states
C. the relative energies of reactant and product
D. the relative energies of the reaction intermediates

61. What is the function of the acid catalyst in the first step of the Fisher esterification of a carboxylic acid?
A. To protonate the carbonyl oxygen
B. To protonate the –OH group of the alcohol
C. To protonate the carbonyl carbon
D. To protonate the –OH oxygen of the carboxyl group

62. A meso compound:
A. is an achiral molecule which contains chiral carbons
B. contains a plane of symmetry or a centre of symmetry
C. is optically inactive
D. is characterized by all of the above

63. Which of the following is the major product of the chlorination of methane if a large excess of chlorine is used?
A. $CHCl_3$
B. CH_2Cl_2
C. CH_3CH_2Cl
D. CCl_4

64. Which product is formed in the peroxide catalysed- hydrobromination of 1- methyl cyclohexene?

A. 4-bromo 1-methyl cyclohexane
B. 2-bromo 1-methyl cyclohexane
C. 1-bromo 1-methyl cyclohexane
D. 5-bromo 1-methyl cyclohexane

65. Which of the following is the rate limiting step for the hydrolysis of *tert*-butyl bromide?

A.loss of water from the carbocation
B. dissociation of alkyl halide into a carbocation and a bromide ion
C. addition of water to the carbocation
D. reaction of the carbocation with bromide ion

66. Which of the following reaction sequence will convert toluene to *para*-chlorobenzoic acid?

A. NBS and hot $KMnO_4/H^+$
B. Cl2/light and hot $KMnO_4/H^+$
C. hot $KMnO_4/H^+$ and $Cl_2/FeCl_3$
D. $Cl_2/FeCl_3$ and hot $KMnO_4/H^+$

67. Which of the following is the best pair of starting materials to make 3-methyl-2-pentene via Witting reaction?

A. acetaldehyde and $CH_3(CH_3CH_2)C{=}PPh_3$
B. acetaldehyde and $CH_3CH{=}PPh_3$
C. 2-butanone and $CH_3CH{=}PPh_3$
D. 3-pentanone and $CH_3CH{=}PPh_3$

68. The Henry's law is applicable if:

A. the temperature and pressure are moderate
B. the solubility of the gas in the solvent is low
C. the gas does not react with the solvent to form a new species
D. all of the above

69. Sugar dissolves in water due to the formation of:

A. covalent bonds
B. ionic bonds
C. co-ordinate bonds
D. hydrogen bonding

70. How many grams of glucose are present in 100 ml of 0.1 M solution:

A. 180 g
B. 18 g
C. 1.8 g
D. 3.6 g

71. A real solution is that which
A. obeys Raoult's law
B. does not obey Raoult's law
C. obeys Henry's law
D. does not obey Henry's law

72. Freezing point depression is measured by:
A. Beckmann's method
B. Rast's camphor method
C. Both
D. none of these

73. Which structure is not found in the phloem of Gymnosperm?
A. Vessels
B. Albuminous cells
C. Companion cells
D. Sieve tubes

74. Monkey puzzle is the common name of_____
A. *Pinussmithania*
B. *Cryptomeria japonica*
C. *Gnetumula*
D. *Araucaria imbricate*

75. The protoplast fusion can be achieved through the use of
A. NaCl
B. PEG
C. KCl
D. $HgCl_2$

76. Copper can be leached from its ores by
A. *Acidithiobacillus ferrooxidans*
B. *Leptospirillum ferriphilum*
C. *Sulfolobus* spp.
D. *Leptospirillum ferrooxidans*

77. Biological control of 'quick wilt disease' is done through
A. *Cercospora rodmanii*
B. *Colletotrichum gloeosporioides*
C. *Gliocladium* spp.
D. *Phytophthora palmivora*

78. The reserve carbohydrate found in family compositae is
A. fructans
B. levans
C. inulin
D. amylase

79. Species having more than one ideal type according to their geographically isolated areas are called____
A. Allopatric
B. Polytypic
C. Sympatric
D. Ecotype

80. Type of nomenclature when the original specimen is missing is called
A. Lectotype
B. Phenotype
C. Holotype
D. Neotype

81. Which of the following is a mismatch
A. *Thermus aquaticus*------Taq polymerase
B. DNase1 ------ Cleaves only dsDNA
C. S1 endonuclease -------- Cleaves only ssDNA
D. Amino acid --------- Ninhydrin

82. Which of the following process require energy?
A. Ligation
B. Restriction digestion
C. Transformation
D. Hybridization

83. Expression vectors contain a sequence, not normally found in other vectors that is known as
A. An MCS site
B. An antibiotic resistant marker
C. A ribosome binding site
D. An *ori* site

84. Turtles are
A. Arthropod
B. Pisces
C. Reptile
D. Mollusc

85. Male mosquitoes usually feed on
A. Garbage
B. Flower sap
C. Human blood
D. All of the above

86. Earthworm eliminate cellular wastes and excess water through
A. Nephridia
B. Flame cells
C. Coelom
D. Gizzard

87. Which of the following compound will show *cis/trans* isomerism?

A. $CH_2=CCl_2$
B. $ClCH=CHBr$
C. $CH_2=CHCl$
D. D. $Cl_2C=CBr_2$

88. Which of the statements is false regarding chiral compounds?
A. rotate the plane of polarized light
B. have cis and trans isomers
C. exist as enantiomers
D. can be detected with a polarimeter

89. Which is the rate-determining step of an E1 reaction?
A. reaction of a carbocation with a nucleophile
B. heterocyclic cleavage of the C-X bond to form a carbon radical
C. heterocyclic cleavage of the C-X bond to form a carbanion
D. heterocyclic cleavage of the C-X bond to form a carbocation

90. Radio carbon dating is used for
A. Date the living plants
B. Date the living animals
C. Date the chemical compounds
D. Date the fossils

91. Serum is
A. Blood without corpuscles and fibrinogen
B. Lymph without corpuscles
C. Blood without fibrinogen
D. Lymph

92. How many pairs of cranial nerves are present in human?
A. 10
B. 18
C. 6
D. 12

93. Bronchi branch into the tubes of smaller diameter (less than 1 mm) known as
A. Trachea
B. Lung
C. Bronchioles
D. Eustachian tubes

94. Channel-forming porin proteins contain
A. beta barrels
B. alpha helix
C. beta sheath
D. alpha helical rods

95. Bacterial integral membrane protein is
A. photosynthetic reaction centre
B. cytochrome C
C. bacteriorhodopsin
D. glycophorin A

96. The development of coelomic cavity in protostome is called
A. Schizocoelus
B. Pseudocoelus
C. Enterocoelus
D. Protocoelus

97. Simple sessile animals that lack true tissues belong to
A. placozoa
B. kinorhyncha
C. cnidaria
D. porifera

98. In cryopreservation, the germplasm is protected from freezing injury by the addition of
A. citric acid
B. activated charcoal
C. DMSO + glecerol
D. polyvinyl pyrrolidine

99. Doubled haploid can be produced with the help of
A. ajmalicine
B. vincristine
C. colchicine
D. morphine

100. Membrane proteins are held in the bilayer by
A. hydrphobic forces
B. covalent bonds
C. hydrophillic forces
D. ionic Bonds