

BSC PART II SEMESTER III
PAPER NO – VI GENETICS AND BIOLOGICAL CHEMISTRY

OBJECTIVE TYPE OF QUESTIONS / MULTIPLE CHOICE OF QUESTION

- 1) Number of genes in an organism is
 - a) Exceeding far more than the actual number of chromosomes
 - b) Equal to the number of chromosomes
 - c) Less than the actual number of chromosomes
 - d) None of the above

- 2) Complete linkage in drosophila was observed by
 - a) Batson and Punnet
 - b) Sutton
 - c) T.H. Morgan
 - d) Boveri

- 3) Association of two dominant genes on a chromosome and their recessive on its homologue is called
 - a) Repulsion phase
 - b) Both repulsion and coupling
 - c) Coupling phase
 - d) none of the above

- 4) Complete linkage is seen in male drosophila because of
 - a) No crossing over
 - b) Crossing over
 - c) No genes on Y chromosomes
 - d) none of the above

- 5) Mechanism of crossing over occurs during
 - a) Pachytene of prophase I
 - b) Second meiotic division
 - c) Before Synapsis
 - d) Dikinesis

- 6) Pairing of homologous chromosomes is seen during
 - a) Leptotene
 - b) Zygotene
 - c) Pachytene
 - d) Diplotene

- 7) Crossing over occurs between
 - a) Sister chromatids
 - b) Non-sister chromatids

c) Nonhomologous chromatids d) none of the above

8) Cytological proof of crossing over in *Drosophila* was given by.....

- a) Mc Clung b) Stern
c) Mc Clintock d) Creighton

9) When a single chiasma occurs only at one point of the non-sister chromatids, is called.....

- a) Single crossing over b) Double crossing over
b) Multiple crossing over d) Reciprocal crossing over

10) Chance of crossing over between two gene loci is more when the genes are.....

- a) Locate very close together b) Located away from each other
b) Not on the same chromosome d) None of the above

11) The ratio obtained in complementary interaction of genes is

- a) 9:3:3:1 b) 15:1
c) 9:7 d) 13:3

12) The two dominant genes in a complementary interaction are

- a) Allelic genes b) Non-allelic genes
c) Located on different chromosomes d) None of the above

13) In supplementary interaction ratio obtained is

- a) 9:3:3:1 b) 9:3:4
c) 9:7 d) 3:1

14) Agouti colour in rabbit is due to C and A genes. A can produce its effect only in presence C, but C produce its own effect (Black) whether not is present. What will be genotype for albino?

- a) CCAA b) CCaa
c) ccaa d) CcAa

15) If A and C together produce agouti colour, C alone for black colour, A has its effect only presence of C. Their recessive genes will have albinos. This of the following is the genotype for black.

- a) CCaa
- b) CCAA
- c) CcAa
- d) ccaa

16) Genes which affect the survivability of an individual is called

- a) Lethal genes
- b) Dominant genes
- c) Silent genes
- d) Recessive genes

17) In rat dominant gene for yellow colour acts as lethal gene in

- a) Homozygous condition
- b) Heterozygous condition
- c) Homozygous recessive
- d) None of the above

18) Sickle – cell anemia is found to be lethal in one of the following condition.....

- a) $Hb^a - Hb^a$
- b) $Hb^a - Hb^s$
- c) $Hb^s - Hb^s$
- d) None of the above

19) The genes which do not kill the individual during early embryo but modify the character are called.....

- a) Fully lethal
- b) Semi lethal
- c) Supravital
- d) none of the above

20) Huntington chorea shows age related lethality. If the lethal effect is seen after producing children, it is called

- a) Lethal
- b) semi lethal
- c) Supralethal
- d) None of the above

21) In Drosophila and human beings the chromosomal type of sex determination is

- a) XX-XO
- b) ZZ-ZW
- c) XX-XY
- d) Haploid diploid type

- 22) XX-XO type of sex determination is also called
- a) Haploid –Diploid b) Honey Bee type
 *c) Protenor d) None of the above
- 23) Male are homogametic in the following one of the type of sex determination.....
- a) XX-XY b) XX-XO
 c) ZZ-ZW d) Honey Bee type
- 24) In honey bee fertilized egg gives rise to
- a) Fertile females b) Drones
 c) Gynanders d) sterile males
- 25) In *Drosophila* super females have the sex
- a) 1.0 b) 1.5*
 c) 0.75 d) 0.5
- 26) In *Bonellia* if the developing larvae are reared close to adult female
- a) They become attached to proboscis and become males
 b) They develop in to females
 c) They become sterile
 d) They become intersexes
- 27) Gynanders in *Drosophila* begin their life as
- a) Females b) Males
 c) Both male and female d) none of the above
- 28) In deoxyribose sugar one oxygen atom is less at position
- a) 1' carbon atom b) 2' carbon atom
 c) 3' carbon atom d) 4' carbon atom
- 29) A nucleoside is formed by the combination of the
- a) Sugar + Nitrogen base b) Sugar + phosphoric acid

c) Phosphoric acid + Nitrogen base d) Sugar + nitrogen base +
Phosphoric acid.

30) In a double stranded DNA molecule cytosine is held by the guanosine nucleotide by the number of bonds of hydrogen.

- a) 1 b) 2
- c) 3 d) 4

31) The bond of linkage between sugar molecule and phosphate group is called

- a) Glycosidic bond b) Peptide bond
- c) Ester bond d) Phosphodiester bond

32) The attachment of purine base to the carbon 1' of the sugar is through the position.....

- a) 1 b) 3
- c) 6 d) 9*

33) The attachment of a pyrimidine base to the carbon 1' of the sugar is through the position.....

- a) 1 b) 3*
- c) 4 d) 6

34) Ribonucleic acid does not contain

- a) Uracil b) Adenine
- c) Thymine d) cytosine

35) Ribose sugar is a

- a) Triose b) Pentose
- c) Hexose d) Heptose

36) mRNA is a complimentary copy of

- a) A single strand of DNA b) Ribosomal RNA
- c) Ribosomal DNA d) None of the above

37) The anticodon region is an important part of

- a) m RNA
- b) hn RNA
- c) t RNA
- d) rRNA

38) The 3' end of the tRNA molecule usually ends in

- a) CCA
- b) CCC
- c) ACA
- d) AAC

39) Activated amino acids are attached to

- a) mRNA
- b) rRNA
- c) tRNA
- d) DNA

40) Ribosomal RNA is produced mainly in the

- a) Ribosome
- b) Nucleolus
- c) Nucleus
- d) Endoplasmic reticulum

41) In a DNA sample, there is 20% Adenine what will be the percentage of cytosine?

- a) 20%
- b) 30%
- c) 40%
- d) 60%

42) Each turn of helix has a length of

- a) 24 Å
- b) 28 Å
- c) 34 Å
- d) 36 Å

43) Enzymes are basically formed of

- a) Proteins
- b) carbohydrates
- c) Lipids
- d) Nucleoproteins

44) Enzymes increase the rate of reaction by

- a) Increasing the free energy of activation
- *b) Decreasing the energy of activation
- c) Changing the equilibrium constant of the reaction

d) Increasing the free energy change of the reaction

45) Holoenzymes consist of

- a) Apo enzyme only
- b) Prosthetic group only
- *c) Apo enzyme + Prosthetic group
- d) none of the above

46) The substrate binding site on the enzyme is called.....

- a) Inactive site
- b) Active Site
- c) Precursor site
- d) none of the above

47) Lock and key model of the enzyme implies that

- a) The active site is flexible and adjusts the substrate
- b) The active site requires removal of PO₄
- c) The active site is complementary in shape to that of substrate
- d) Substrate change conformation prior to interaction.

48) Pure water or neutral aqueous solution has a pH

- a) 5
- b) 7
- c) 9
- c) 11

49) Hydrogen ion concentration below 7 is

- a) Acidic
- b) Basic
- c) Neutral
- d) None of the above

50) The pH of the venous blood is normally.....

- a) 7.4
- b) 7.35
- c) 7.0
- d) 8.0

51) The most important physiological buffer in the blood is.....

- a) Haemoglobin buffer system
- b) Acetate buffer
- c) Phosphate buffer
- d) Bicarbonate buffer

- 52) The pH of the buffer is determined by the equation
- | | |
|-------------------------|-------------------------------|
| a) Henderson and Joules | b) Henderson and Harrison |
| c) Henderson and smith | d) Henderson and Hasselblanch |
- 53) In a water molecule two hydrogen atoms are linked up with one oxygen atom by
- | | |
|---------------------|----------------------|
| a) Noncovalent bond | *b) Covalent bond |
| c) Double bond | d) none of the above |
- 54) In a water molecule the oxygen side is more.....
- | | |
|-------------|----------------------|
| a) Negative | b) Positive |
| c) Neutral | d) None of the above |
- 55) Milk sugar is.....
- | | |
|--------------|-------------|
| a) Mannose | *b) Lactose |
| c) Galactose | d) Glucose |
- 56) Cane sugar is
- | | |
|-------------|------------|
| a) Sucrose | b) Maltose |
| c) Fructose | d) Glucose |
- 57) Table sugar which is used in making tea is
- | | |
|-------------|------------|
| a) Sucrose | b) Maltose |
| c) Fructose | d) Glucose |
- 58) The carbohydrate reserve in animal body is
- | | |
|------------|--------------|
| a) Starch | b) Cellulose |
| c) Glucose | d) Glycogen |
- 59) A polymeric unit of starch which has a branched structure is
- | | |
|---------------|----------------|
| a) Amylose | b) Amylopectin |
| c) Cellobiose | d) Glucose |

60) The two monosaccharide molecules are linked to form a disaccharide through a linkage called

- a) Peptide linkage
- b) Ester linkage
- c) Glycosidic linkage
- d) Phosphodiester linkage

61) Starch is a polymer of

- a) Glucose
- b) galactose
- c) Sucrose
- d) Maltose

62) Cellulose is a

- a) Monosaccharide
- b) Disaccharide
- c) Oligosaccharide
- d) Polysaccharide

63) The monomeric units of a protein molecule are

- a) Monosaccharide
- b) Amino acids
- c) Fatty acids
- d) Glucose

64) In a polypeptide chain the $-COOH$ group of one amino acid is linked to group of next amino acid.

- a) $-CH$
- b) $-NH_2$
- c) $-OH$
- d) $-SH$

65) Amino acid of a protein is linked to one another by

- a) Glycosidic bond
- b) Ester bond
- c) Peptide bond
- d) None of the above

66) Fibroin is formed in

- a) Silk
- b) Three
- c) Feathers
- d) Yolk

67) Conjugated protein contains a non- protein part called

- a) Polar group
- b) Non-Polar group
- c) Prosthetic group
- d) Carboxyl group

- 68) Building blocks of the lipid are
- a) Amino acids b) Nucleotides
c) Fatty acids d) Monosaccharides.
- 69) A nucleoside composed of -----
- a) A base + a sugar **b) Base + sugar+ phosphate**
c) Base + phosphate d) None of these
- 70) Genetic mutation occur in -----
- a) RNA **b) DNA**
c) Proteins d) Nucleus
- 71) DNA is present in-----
- a) Nucleus only b) Nucleus, mitochondria, ER
c) Nucleus, mitochondria, Chloroplast d) Nucleus, mitochondria, RER
- 72) DNA is genetic material in -----
- a) Viruses, prokaryotes, eukaryotes b) Prokaryotes, eukaryotes
c) Only in eukaryotes **d) Some viruses, prokaryotes, eukaryotes**
- 73) The two strands in a DNA helix is joined by-----
- a) Covalent bond **b) Hydrogen bond**
c) Ionic bond d) Phosphodiester bond
- 74) The basic repeatating unit of DNA molecule is -----
- a) Nucleotide **b) Nucleoside**
c) Histone d) Aminoacid
- 75) Adjacent nucleotide are joined by -----
- a) Covalent bond **b) Hydrogen bond**
c) Ionic bond d) Phosphodiester bond
- 76) The type of sugar present in DNA-----
- a) Triose b) Hexose
c) Pentose d) Tetrose

77) Z-DNA have a-----

- a) Double helical nature
- b) **Zig-zac appearance**
- c) Uracil base
- d) Single stranded

78) Left handed DNA-----

- a) A- DNA
- b) B- DNA
- c) **Z- DNA**
- d) C-DNA

79) RNA is -----

- a) **Single stranded**
- b) Double stranded
- c) Triple stranded
- d) Both a & b

80) The sugar in RNA is-----

- a) Deoxyribose
- b) **Ribose**
- c) Hexose
- d) Fructose

81) Thymine is replaced by

- a) Guanine
- b) Cytocine
- c) Adenine
- d) **Uracile**

82) r- RNA is synthesized in-----

- a) Nucleus
- b) Cytoplasm
- c) **Nucleous**
- d) RER

83) RNA is present in -----

- a) Nucleus
- b) **Cytoplasm**
- c) RER
- d) SER

84) What is the nature of an enzyme?

- a)Vitamin
- b)Lipid
- c)Carbohydrate
- d)**Protein**

85) The term enzyme are coined by -----

- a) Pasture
- b) **Kunhe**
- c) Miller
- d) Bucher

86) Lock & Key theory mechanism of enzyme action was proposed by-----

- a) Koshland
- b) **Fischer**

