

DPP - Daily Practice Problems

Chapter-wise Sheets

Date :

Start Time :

End Time :

BIOLOGY

CB09

SYLLABUS : Biomolecules

Max. Marks : 180

Marking Scheme : + 4 for correct & (–1) for incorrect

Time : 60 min.

INSTRUCTIONS : This Daily Practice Problem Sheet contains 45 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

- A nucleotide is formed of
 - Purine, pyrimidine and phosphate
 - Purine, sugar and phosphate
 - Nitrogen base, sugar and phosphate
 - Pyrimidine, sugar and phosphate
- Glycogen is a polymer of
 - galactose
 - glucose
 - fructose
 - sucrose
- Most abundant organic compound on earth is
 - Protein
 - Cellulose
 - Lipids
 - Steroids
- Protein synthesis in a cell takes place
 - only in the cytoplasm
 - in the nucleolus as well as in cytoplasm
 - in cytoplasm as well as in mitochondria
 - only on ribosomes attached to the nuclear envelope
- In RNA, thymine is replaced by
 - Adenine
 - Guanine
 - Cytosine
 - Uracil
- Which of the following is a reducing sugar?
 - Galactose
 - Gluconic acid
 - β -methyl galactoside
 - Sucrose
- An enzyme that can stimulate germination of barley seeds is
 - lipase
 - protease
 - invertase
 - α -amylase
- Carrier ions like Na^+ facilitate the absorption of substances like:
 - amino acids and glucose
 - glucose and fatty acids
 - fatty acids and glycerol
 - fructose and some amino acids

RESPONSE
GRID

- | | | | | |
|--|--|--|--|--|
| 1. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 2. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 3. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 4. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 5. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 6. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 8. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | | |

Space for Rough Work

9. An enzyme brings about
 (a) decrease in reaction time
 (b) increase in reaction time
 (c) increase in activation energy
 (d) reduction in activation energy
10. The enzymes hexokinase which catalyses glucose to glucose-6-phosphate in glycolysis is inhibited by glucose-6-phosphate. This is an example of
 (a) competitive inhibition
 (b) non-competitive inhibition
 (c) feedback allosteric inhibition
 (d) positive feedback
11. The enormous diversity of protein molecules is due mainly to the diversity of
 (a) amino groups on the amino acids
 (b) R groups on the amino acids
 (c) amino acid sequences within the protein molecule
 (d) peptide bonds
12. Length of one turn of the helix in a B-form DNA is approximately
 (a) 3.4 nm (b) 2 nm
 (c) 0.34 nm (d) 20 nm
13. The catalytic efficiency of two different enzymes can be compared by the
 (a) formation of the product
 (b) pH optimum value
 (c) K_m value
 (d) molecular size of the enzyme
14. Which of the following sets contains polysaccharides?
 (a) Glucose, fructose, lactose
 (b) Starch, glycogen, cellulose
 (c) Sucrose, maltose, cellulose
 (d) Galactose, starch, sucrose
15. Sigmoid growth curve is represented by
 (a) $dN/dt = rN$
 (b) $dN/dt = rN(1 - N/K)$
 (c) $N_t = N_0 + B + I - D - E$
 (d) $dN/dt = 1 - N/K$
16. A coenzyme is
 (a) Same enzyme that occurs in different tissues such as heart and muscle
 (b) One that shares the function of other enzyme
 (c) Organic or inorganic in nature and helps activate metabolic enzymes
 (d) Organic non-protein in nature and helps to activate metabolic enzymes
17. The most basic amino acid is
 (a) Arginine (b) Histidine
 (c) Glycine (d) Glutamine
18. Which of the following is not an aromatic amino acid?
 (a) Valine (b) Tyrosine
 (c) Phenylalanine (d) Tryptophan
19. The class of enzymes that catalyze the removal of a group from a substrate without addition of water, leaving double bonds, is
 (a) Transferases (b) Dehydrogenases
 (c) Hydrolases (d) Lyases
20. Which of the following is a component of vitamin (thiamine, biotin), Acetyl CoA, cysteine, methionine and ferredoxin?
 (a) Fe (b) S
 (c) Co (d) K
21. The helical structure of protein is stabilized by
 (a) Ester (b) Peptide bonds
 (c) Disulphide bonds (d) Hydrogen bonds
22. Cellulose is a polymer of
 (a) α -glucose (b) α -D-glucose
 (c) β -D-glucose (d) β -L-glucose

**RESPONSE
GRID**

- | | | | | |
|------------------|------------------|------------------|------------------|------------------|
| 9. (a)(b)(c)(d) | 10. (a)(b)(c)(d) | 11. (a)(b)(c)(d) | 12. (a)(b)(c)(d) | 13. (a)(b)(c)(d) |
| 14. (a)(b)(c)(d) | 15. (a)(b)(c)(d) | 16. (a)(b)(c)(d) | 17. (a)(b)(c)(d) | 18. (a)(b)(c)(d) |
| 19. (a)(b)(c)(d) | 20. (a)(b)(c)(d) | 21. (a)(b)(c)(d) | 22. (a)(b)(c)(d) | |

Space for Rough Work

32. Cellulose differs from chitin in
 (a) Branching
 (b) Type of glycosidic bond
 (c) Type of monomer unit
 (d) Abundancy in biosphere
33. Oils are rich in
 (a) Glycerol that possesses three hydroxyl groups
 (b) Saturated fatty acids
 (c) Fats that are generally liquid at room temperature
 (d) Esters of fatty acids
34. Bonds that do not exist in tertiary structure of proteins
 (a) Covalent bonds
 (b) Phosphodiester bonds
 (c) Hydrophobic interactions
 (d) Ionic bonds
35. Cleavage of specific covalent bonds and removal of groups without hydrolysis is the property of
 (a) Isomerases (b) Lyases
 (c) Hydrolases (d) Transferases
36. The catalytic efficiency of two different enzymes can be compared by the
 (a) K_m value
 (b) pH value
 (c) Formation of the product
 (d) Molecular size of the enzyme
37. Which of the following is an example of isozyme?
 (a) α -Amylase
 (b) Glucokinase
 (c) Lactate dehydrogenase
 (d) All of these
38. Essential amino acids include
 (a) leucine (b) valine
 (c) tryptophan (d) all of these
39. Acidic amino acids have two $-\text{COOH}$ groups and one $-\text{NH}_2$ group per molecule. Select the pair that consists of acidic amino acids.
 (a) Aspartic acid, glutamic acid
 (b) Lysine, arginine
 (c) Glycine, alanine
 (d) Both (a) and (b)
40. The structure of glucose and galactose are same except with regard to
 (a) First carbon atom
 (b) Second carbon atom
 (c) Third carbon atom
 (d) Fourth carbon atom
41. All the following statements are true with regard to glucose, except :
 (a) It is an aldohexose
 (b) It is a reducing sugar
 (c) It is present in starch and cellulose
 (d) It is an epimer of fructose
42. Guanylic acid is a
 (a) Nucleoside of purine
 (b) Nucleoside of pyrimidine
 (c) Nucleotide of purine
 (d) Nucleotide of pyrimidine
43. Long chain molecules of fatty acids are formed by
 (a) Polymerisation of 2 carbon compounds
 (b) Decomposition of fats
 (c) Polymerisation of glycogen
 (d) Conversion of glycogen
44. Read the following four statements (A to D) and mark the option that has both correct statements
 A. Blood conc. of glucose in a normal healthy man is 4.5 to 5.0 mM
 B. In proteins only left handed helices are observed
 C. The pitch of B-DNA is 3.4 Angstrom
 D. At each step of ascent the strand of DNA turns 36 degree
 (a) A, B (b) B, C (c) C, D (d) A, D
45. Which one of the following biomolecules is correctly characterized?
 (a) Lecithin - A phosphorylated glyceride found in cell membrane.
 (b) Palmitic acid - An unsaturated fatty acid with 18 carbon atoms.
 (c) Adenylic acid - Adenosine with a glucose phosphate molecule.
 (d) Alanine amino acid - Contains an amino group and an acidic group anywhere in the molecule.

**RESPONSE
GRID**

32. (a)(b)(c)(d) 33. (a)(b)(c)(d) 34. (a)(b)(c)(d) 35. (a)(b)(c)(d) 36. (a)(b)(c)(d)
 37. (a)(b)(c)(d) 38. (a)(b)(c)(d) 39. (a)(b)(c)(d) 40. (a)(b)(c)(d) 41. (a)(b)(c)(d)
 42. (a)(b)(c)(d) 43. (a)(b)(c)(d) 44. (a)(b)(c)(d) 45. (a)(b)(c)(d)

Space for Rough Work

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 9 - BIOLOGY

Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	45	Qualifying Score	55
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct \times 4) – (Incorrect \times 1)			

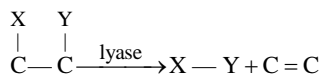
HINTS & SOLUTIONS

DPP /CB09

- | Some Secondary Metabolites | |
|----------------------------|---------------------------------|
| Pigments | Carotenoids, anthocyanins, etc. |
| Alkaloids | Morphine, Codeine, etc. |
| Terpenoids | Monoterpenes, Diterpenes, etc. |
| Essential oils | Lemon grass oil, etc. |
| Toxins | Abrin, Ricin |
| Lectins | Concanavalin A |
| Drugs | Vinblastin, Curcumin, etc. |
| Polymeric substances | Rubber, Gums, Cellulose. |

Vinblastin is used as an anticancer drug, whereas curcumin is a component of turmeric and also used as drug.

30. (b) Lyases enzyme catalyze the breakage of specific covalent bonds and removal of groups without hydrolysis producing double bonds or removal of double bonds by adding groups e.g., histidine decarboxylase that splits C–C bond of histidine, forming CO₂ and histamine.



Fructose-1, 6 diphosphate $\xrightarrow{\text{Aldolase}}$ Dihydroxyacetone-3-phosphate + Glyceraldehyde-3-phosphate.

31. (c) Successive glucose units are linked together by α 1 \rightarrow 4 linkage and at branchings α 1 \rightarrow 6 linkage is present.
32. (c) **33. (c)**
34. (b) Tertiary structure of proteins is devoid of phosphodiester bonds. These bonds are present in nucleic acids.
35. (b)
36. (a) A high k_m indicates low affinity of an enzyme for its substrate.
37. (d) The multiple molecular forms of an enzyme occurring in the same organisms and having a similar substrate activity are called isoenzymes or isozymes. They have similar properties but different molecular weights and location. Over 100 enzymes are known to have isoenzymes. α -amylase of wheat endosperm has 16 isozymes, lactate dehydrogenase has 5 isozymes.
38. (d) Essential amino acids are the amino acids which cannot be synthesized by organisms in the body and are obtained from plants e.g., valine, leucine, isoleucine, phenylalanine, threonine, lysine, tryptophan, methionine.
Non-essential amino acids can be synthesized by the organism and may not be the requisite components of diet e.g., serine, tyrosine, aspartate, cysteine, glutamate, proline, glycine, alanine, asparagine, glutamine and tyrosine.
39. (a) Acidic amino acids have an extra carboxylic group (mono-amino dicarboxylic), e.g., glutamate (glutamic acid, Glu), aspartate (aspartic acid, Asp).
Basic amino acids have an additional amino group without forming amides (diamino monocarboxylic), e.g., arginine (Arg), lysine (Lys).
Neutral amino acids have one amino group and one carboxylic group (mono-amino monocarboxylic) with noncyclic hydrocarbon chain, e.g., glycine (Gly), alanine (Ala), valine (Val), Leucine (Leu), isoleucine (Ile). Essential amino acids are the amino acids which cannot be synthesized by organisms in the body and are obtained from plants e.g., valine, leucine, isoleucine, phenylalanine, threonine, lysine, tryptophan, methionine.
Non-essential amino acids can be synthesized by the organism and may not be the requisite components of diet e.g., serine, tyrosine, aspartate, cysteine, glutamate, proline, glycine, alanine, asparagine, glutamine and tyrosine.
40. (d)
41. (b) Trehalose is a non-reducing sugar. It is made up of 2 molecules of glucose
42. (c) **43. (a) 44. (d)**
45. (a) Palmitic acid is one of the most common saturated fatty acids found in animals and plants. It has 16 carbons including the carboxyl carbon.