DPP - Daily Practice Problems

Name : _____ Date : _____

Start Time : _____ End Time : _____

CHEMISTRY 57

SYLLABUS : Bimolecules - II : Fats and Lipids, Vitamins, Hormones and Nucleic acids

Max. Marks : 120 **Time : 60 min.**

GENERAL INSTRUCTIONS

- The Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.
- You have to evaluate your Response Grids yourself with the help of solution booklet.
- Each correct answer will get you 4 marks and 1 mark shall be deduced for each incorrect answer. No mark will be given/ deducted if no bubble is filled. Keep a timer in front of you and stop immediately at the end of 60 min.
- The sheet follows a particular syllabus. Do not attempt the sheet before you have completed your preparation for that syllabus. Refer syllabus sheet in the starting of the book for the syllabus of all the DPP sheets.
- After completing the sheet check your answers with the solution booklet and complete the Result Grid. Finally spend time to analyse your performance and revise the areas which emerge out as weak in your evaluation.

DIRECTIONS (Q.1-Q.24) : There are 24 multiple choice questions. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE choice is correct.

Q.1 The 'acid value' of an oil or fat is measured in terms of weight of

(a) NH_4OH (b) NaOH

(c) KOH (d) CH_3COOH

Q.2 The 'saponification value' of an oil or fat is measured in terms of

(a) NH_4OH

(b) NaOH

(c) KOH

(d) C_6H_5OH

Q.3 The 'iodine value' of an oil indicates

(a) Its boiling point

(b) Inflammability

(c) Unsaturation present in acid contents

(d) Solubility of salt in oils

Q.4 The most important food reserves of animals and plants are

(a) Carbohydrates (b) Proteins

(c) Vitamins (d) Fats

Q.5 The energy change produced by the combustion of food is called the 'calorific value'. The highest calorific value is given by

(a) Proteins (b) Fats

(c) Carbohydrates (d) Vitamins

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ	5. ⓐⓑⓒⓓ

Space for Rough Work

Q.6 The alcohol obtained by the hydrolysis of oils and fats is
(a) Glycol (b) Glycerol
(c) Propanol (d) Pentanol

Q.7 Oleic, stearic and palmitic acids are
(a) Fatty acids (b) Amino acids
(c) Nucleic acids (d) Essential acids

Q.8 An example for a saturated fatty acid, present in nature is
(a) Oleic acid (b) Linoleic acid
(c) Linolenic acid (d) Palmitic acid

Q.9 A nucleotide consists of
(a) Base and sugar
(b) Base and phosphate
(c) Sugar and phosphate
(d) Base, sugar and phosphate

Q.10 The base adenine occurs in
(a) DNA only (b) RNA only
(c) DNA and RNA both (d) Protein

Q.11 The protein which maintains blood sugar level in the human body
(a) Haemoglobin (b) Oxytocin
(c) Insulin (d) Ptyalin

Q.12 The chemical name of vitamin C is
(a) Ascorbic acid
(b) Folic acid
(c) Nicotinic acid
(d) Tartaric acid

Q.13 In DNA the complementary bases are
(a) Uracil and adenine; cytosine and guanine
(b) Adenine and thymine; guanine and cytosine
(c) Adenine and thymine; guanine and uracil
(d) Adenine and guanine, thymine and cytosine

Q.14 Vitamin B_1 is
(a) Riboflavin
(b) Cobalamin
(c) Thiamine
(d) Pyridoxine

Q.15 A gene is a segment of a molecule of
(a) DNA (b) *m*-RNA
(c) *t*-RNA (d) Protein

Q.16 Which of the following is not a sex hormone?
(a) Testosterone (b) Estrone
(c) Estradiol (d) Cortisone

Q.17 The base present in DNA, but not in RNA is
(a) Guanine
(b) Adenine
(c) Uracil
(d) Thymine

Q.18 Mutation of DNA occurs due to changes in the sequence of one of the following ?
(a) Bases (b) Ribose units
(c) Phosphate units (d) Sugar units

Q.19 The hormone that helps in the conversion of glucose to glycogen in
(a) Adrenaline (b) Insulin
(c) Cortisone (d) Bile acids

Q.20 A nucleoside on hydrolysis gives
(a) A heterocyclic base and orthophosphoric acid
(b) An aldopentose, a heterocyclic base and orthophosphoric acid
(c) An aldopentose and a heterocyclic base
(d) An aldopentose and orthophosphoric acid

RESPONSE GRID					
	6. ⓐⓑⓒⓓ	7. ⓐⓑⓒⓓ	8. ⓐⓑⓒⓓ	9. ⓐⓑⓒⓓ	10. ⓐⓑⓒⓓ
	11. ⓐⓑⓒⓓ	12. ⓐⓑⓒⓓ	13. ⓐⓑⓒⓓ	14. ⓐⓑⓒⓓ	15. ⓐⓑⓒⓓ
	16. ⓐⓑⓒⓓ	17. ⓐⓑⓒⓓ	18. ⓐⓑⓒⓓ	19. ⓐⓑⓒⓓ	20. ⓐⓑⓒⓓ

Space for Rough Work

Q.21 Vitamin B_6 is known as

(a) Pyridoxin

(b) Thiamine

(c) Tocopherol

(d) Riboflavin

Q.22 Which of the following is not a lipid?

(a) Oils

(b) Fats

(c) Waxes

(d) Proteins

Q.23 Which of the following indicates the number of free –OH groups in an oil or fat?

(a) Iodine value

(b) Acid value

(c) Acetyl value

(d) Saponification value

Q.24 Which of the following is not glyceride?

(a) Lipids (simple)

(b) Phospholipids

(c) Sphingolipids

(d) All of these

DIRECTIONS (Q.25-Q.27) : In the following questions, more than one of the answers given are correct. Select the correct answers and mark it according to the following codes:

Codes:

(a) 1, 2 and 3 are correct **(b)** 1 and 2 are correct

(c) 2 and 4 are correct **(d)** 1 and 3 are correct

Q.25 Which of the following statements about the assembly of nucleotides in a molecule of deoxyribose nucleic acid (DNA) is incorrect ?

(1) A pentose of one unit connects to a pentose of another

(2) A pentose of one unit connects to the base of another

(3) A phosphate of one units connects to the base of another

(4) A phosphate of one unit connects to a pentose of another

Q.26 Which of the following is a constituent of RNA?

(1) Ribose (2) Phosphate

(3) Adenine (4) Pyridine

Q.27 Which of the following compounds do not belong to lipids?

(1) Fats (2) Amino acids

(3) Phospholipids (4) Carbohydrates

RESPONSE GRID					
	21. ⓐⓑⓒⓓ	22. ⓐⓑⓒⓓ	23. ⓐⓑⓒⓓ	24. ⓐⓑⓒⓓ	25. ⓐⓑⓒⓓ
	26. ⓐⓑⓒⓓ	27. ⓐⓑⓒⓓ			

Space for Rough Work

DIRECTIONS (Q. 28-Q.30) : Each of these questions contains two statements: Statement-1 (Assertion) and Statement-2 (Reason). Each of these questions has four alternative choices, only one of which is the correct answer. You have to select the correct choice.

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.

(c) Statement -1 is False, Statement-2 is True.

(d) Statement -1 is True, Statement-2 is False.

Q.28 Statement-1 : Valine is an essential amino acid.

Statement-2 : The lack of essential amino acids in the diet causes Kwashiorkor.

Q.29 Statement-1 : DNA as well as RNA molecules are found in the nucleus of a cell.

Statement-2 : On heating, the enzymes do not lose their specific activity.

Q.30 Statement-1: ATP molecules are energyrich molecules.

Statement-2 : ATP consists of a purine base adenine, pentose sugar ribose and a string of three phosphate groups.

RESPONSE GRID	28.ⓐⓑⓒⓓ	29.ⓐⓑⓒⓓ	30.ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM SHEET 57 - CHEMISTRY			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	44	Qualifying Score	64
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

Space for Rough Work

DAILY PRACTICE PROBLEMS

CHEMISTRY SOLUTIONS

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1. **(c)** Acid value is the number of mg of KOH required to neutralize 1 gm of the fat or oil.

2. **(c)** Saponification value is the number of mg of KOH required to neutralize the fatty acid resulting from the complete hydrolysis of 1 gm of oil or fat.

3. **(c)** Iodine number is the number of gms of I_2 which combine with 100 gm of oil or fat. It shows the degree of unsaturation of acids in fat or oil.

4. **(d)** Fats are called energy bank of the body.

5. **(b)** 1 gm carbohydrate on oxidation gives 17 kJ of energy while 1 gm fat provides 37 kJ of energy.

6. **(b)**

$$\underset{\text{Lipid or Triglyceride}}{\begin{matrix}CH_2OOCR\\ |\\ CHOOCR\\ |\\ CH_2OOCR\end{matrix}} + H_2O \longrightarrow \underset{\text{Glycerol or Trihydric alcohol}}{\begin{matrix}CH_2OH\\ |\\ CHOH\\ |\\ CH_2OH\end{matrix}} + \underset{\text{Monocarboxylic acid}}{3R-COOH}$$

7. **(a)** Oleic acid, stearic acid and palmitic acid are produced by the hydrolysis of fats hence called fatty acids.

8. **(d)** Oleic acid – $C_{17}H_{33}COOH$, linoleic acid-$C_{17}H_{31}COOH$, linolenic acid - $C_{17}H_{29}COOH$, palmitic acid - $C_{15}H_{31}COOH$.

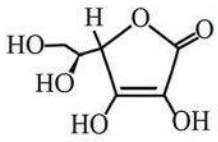
Saturated monocarboxylic acids form a homologous series which has a general formula $C_nH_{2n+1}COOH$ or $C_nH_{2n}O_2$. Only palmitic acid follows this.

9. **(d)** $\underbrace{\text{Nitrogen base} + \text{Sugar}}_{\text{Nucleoside}} + \text{Phosphate} = \text{Nucleotide}$

10. **(c)** Adenine is a purine base common in both RNA and DNA.

11. **(c)** Insulin hormone which is secreted by pancreas.

12. **(a)**



Ascorbic acid (vitamin C)

13. **(b)** Adenine = Thymine, Guanine ≡ Cytosine
(2 hydrogen bonds; 3 hydrogen bonds)

14. **(c)** Vitamin B_1 is thiamine. Its main source is cereals.

15. **(a)** Gene is a part of the DNA molecule that codes for a specific protein.

16. **(d)** Cortisone is not a sex hormone, it regulates metabolism of fats , carbohydrates, proteins etc.

17. **(d)** Thymine is present only in DNA while in RNA there is uracil.

18. **(a)** Mutation is a chemical change in the sequence of nitrogenous bases along the DNA strained which can lead to the synthesis of protein with altered amino acid sequence.

19. **(b)** Insulin is a hormone secreted by pancreas. It lowers blood glucose level by promoting the uptake of glucose by cells and the conversion of excess of glucose to glycogen by liver and skeletal muscles.

20. **(c)** Nucleoside on hydrolysis gives an aldopentose and a heterocyclic base (purine and pyrimidine).

21. **(a)** Vitamin B_6 is called pyridoxin. It is found in fruits, green-vegetables, milk etc. Due to its deficiency, anaemia disease is caused.

22. **(d)** Proteins are polymers of amino acids.

23. **(b)**

24. **(c)** Sphingolipids are not glycerides.

25. **(a)** A pentose of one unit connects to a pentose of another through phosphate group.

26. **(a)** Pyridine is not a constituent of RNA.

27. **(c)**

28. **(b)** Valine is an essential amino acid. The amino acids which the body cannot synthesize are called essential amino acids.

29. **(d)** DNA is found mainly in the nucleus of the cell and RNA occurs mainly in the cytoplasm of the cell. So assertion given is false.

Enzymes are very good biological catalysts in certain temperature range but they lose their specific activity on heating.

Hence reason is also a wrong statement.

30. **(b)** ATP has four negatively charged oxygen atoms very close to each other. So the repulsive forces between them is high. On hydrolysis of ATP, a $H_2PO_4^-$ ion is eliminated and the number of negatively charged oxygen atoms decreases. Thus, repulsive forces decreases and a large amount of energy is set free. When ATP changes to ADP, which in turn changes into AMP, energy is released at each step. This is how ATP can act as a source of energy.