

3 Hours

Total marks:100

**Instructions:****Please check that you have received the correct question paper.**

- All questions are compulsory. Choice is internal.
- Figures to the right indicate full marks.
- Draw structures/flowcharts/diagrams wherever necessary.

**Q.1 (A) State True or False:****(04)**

- Saponification number is used to determine the amount of free fatty acids in fats.
- Oleic acid is a monounsaturated fatty acid
- Rancidity can be caused due to prolonged exposure to sunlight.
- Stearic acid contains 1 double bond.

**Q.1 (B) Attempt any three:****(09)**

- State the common and IUPAC names of saturated fatty acids containing 6, 10 and 14 carbon atoms.
- Mentioning the structure write a note on lecithin.
- With the help of reactions explain the process of saponification.
- What are neutral fats? Write a short note on the same.
- Enlist the functions of lipids.
- Elucidate ozonolysis with appropriate reactions.

**Q.1 C) Answer any two in detail:****(12)**

- With the help of reactions, explain: 1) auto oxidation and 2) iodination.
- Discuss cholesterol under following: a) structure b) occurrence c) biological significance.
- Discuss the types of compound lipids, giving one example for each.
- Give a detailed account of rancidity and its types.

**Q.2 (A) State True or False:****(04)**

- Adenine is an example of a pyrimidine.
- Heat causes decrease in UV absorption of DNA solution.
- The pentose sugar present in DNA is deoxyribose.
- Guanosine forms double bonds with Cytosine.

**Q.2 (B) Attempt any three:****(09)**

- Orcinol reagent helps detect presence of RNA. With the help of reaction explain the principle of the same.
- Write a short note on denaturation of DNA.
- With the help of an example explain ribozymes.
- Compare and contrast: DNA and RNA
- The following base sequence represents part of the transcribing strand of DNA. 5'TAGGATAAGCTCC3'. 1) Give the orientation and base sequence of the complementary strand. 2) Give the orientation and base sequence of the RNA that is synthesized from it.
- Give an account of Chargaff's rule.

**Q.2 (C) Answer any two in detail:**

**(12)**

- (i) Describe the structural characteristics and functions of 1) mRNA and 2) rRNA.
- (ii) Elaborate on the Watson and Crick model of structure of DNA and its features.
- (iii) Explain pyrimidine under a) different types and their structure and b) IUPAC Nomenclature of the bases c) Nucleosides and nucleotides.
- (iv) Discuss the effect of heat on the physical properties of DNA.

**Q.3 (A) State True or False:**

**(04)**

- (i) 1 KJ is equal to 0.24 calories
- (ii) Unit of BMI is kg/m<sup>2</sup>.
- (iii) Vitamin D helps in calcium absorption.
- (iv) DIT stands for diet induced toxicity.

**Q.3 (B) Attempt any three:**

**(09)**

- (i) Give a brief explanation on any two protein indices.
- (ii) What is a balanced diet? Add a note on formulation of the same.
- (iii) Which anthropometric parameter is used to represent clinical obesity? Write a brief note on the same.
- (iv) Write a note on role of fibres in human nutrition.
- (v) Describe the importance of water as a part of diet.
- (vi) Discuss any two vitamins that act as coenzymes.

**Q.3 (C) Answer any two in detail:**

**(12)**

- (i) Kaustubh's dietician has recommended him to consume only 1800 calories a day for a healthier lifestyle. His everyday meal contains 160g carbohydrates, 130g proteins and 120g fats and 2.5 litres of water. 1) Calculate the total calorific value of the food. 2) Does his daily intake go beyond the recommendation?
- (ii) Justify: Minerals play wide variety of functions in the body.
- (iii) Traditional Indian diet includes perfect combinations to ensure adequate protein intake. Describe the importance of the same for a healthy life.
- (iv) Explain the role of lipids as nutrient.

**Q.4 (a) Define and explain any five:**

**(10)**

- |                          |                               |                     |             |
|--------------------------|-------------------------------|---------------------|-------------|
| (i) Essential Fatty Acid | (ii) Phosphatidylethanolamine | (iii) Hyperchromism | (iv)        |
| SDA                      | (v) Vitamin A                 | (vi) Joule          | (vii) Waxes |

**Q.4 (b) Write elaborate notes on any three:**

**(15)**

- (i) Why are PUFA indispensable for the body?
- (ii) Define and give one significance of 1) Acid number 2) Iodine number
- (iii) Explain in detail the structure of t-RNA with the help of a diagram.
- (iv) DNA gives a colored product when reacted with DPA reagent.
  - a) Explain the principle of the test.
  - b) Give the reactions involved in the same.
  - c) Can this test be used for quantitative estimation of DNA?
- (v) Write a detailed note on any five factors affecting BMR.
- (vi) Discuss the apparatus used for determination of calorific value of food.

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