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PG2S-337-B-23
M.Sc. II Semester Degree Examination
BIOCHEMISTRY
Nutritional Biochemistry
Paper - OET-2.1

Time : 3 Hours   Maximum Marks :80

Instructions: **Answer Question 1 and any Four of the remaining**

Answer any TEN of the following.   **(10×2=20)**

1. a)   Define and enlist the PUFA mentioning nutritional importance.

    b)   How does fortification of protein influence nutritional quality food?

    c)   What are macronutrients? Give any two examples.

    d)   Define protein sparing action of carbohydrate.

    e)   Why is nutritive value of food(s) mentioned on the packing labels?

    f)   Enlist the factors that effect basal metabolic rate(BMR)

    g)   What are anti-vitamins? How do they influence nutritional quality of food?

    h)   List out any five diseases associated with trace elements deficiency.

    i)   What are the vitamins and mineral nutrients required for hair growth?

    j)   Why does dehydration occur? Mention the symptoms of dehydration.

    k)   What is 'Oral rehydration salt' solution? Give the composition.

    l)   Suggest the nutritional requirements for patient suffering from Lathyrism.

2. a)   What is phrynoderma? Explain the possible reasons and symptoms of phrynoderma

    b)   Write a note on the methods for the evaluation of nutritive values of proteins**(7+8=15)**

3. a)   Define nitrogen balance. Justify supplementation of food with protein improves its quality.

    b)   List out essential amino acids. Write a note on protein calorific malnutrition.**(7+8=15)**

4. a) Define SDA of food. Discuss on energy requirements for different physical activities

   b) What is nutritive value of foods? Write a note on nutritive value of meat and fruits and vegetables. **(7+8=15)**

5. a) Explain the functions and deficiency symptoms of B-complex vitamins.

   b) What are trace elements? Discuss the requirements and functions of Ca, Fe, Mg, P. **(7+8=15)**

6. a) How is electrolyte balance attained? Explain about water balance and water intoxication.

   b) Discuss on nutritional requirements during childhood, adolescence, and for athlets. **(8+7=15)**

7. Write notes on any **Three** of the following **(3×5=15)**

   a) Dietary fibers

   b) Basal Metabolic Rate(BMR)

   c) Fat soluble vitamins

   d) Distribution of water in the body.

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PG2S-336-B-23
M.Sc. II Semester Degree Examination
BIOCHEMISTRY
Microbial Biotechnology
Paper - SCT-2.1

Time : 3 Hours   Maximum Marks :80

Instructions to Candidate:

Answer question No.**1** and any **Four** of the remaining.

Answer any **Ten** of the following: (10×2=20)

1. a)   Mention any two characteristics of ideal medium.

    b)   Differentiate between solid state fermentation and submerged fermentation.

    c)   What are anti foam agents? Give examples.

    d)   Mention microorganisms used for industrial production of glutamic acid. Give any two uses of glutamic acid.

    e)   Differentiate between bactericidal and bacteriostatic agents with suitable example each.

    f)   Give applications and mode of action of streptomycin.

    g)   Mention applications and micro-organism used in production of vitamin B2.

    h)   What are bio fuels? Name various raw materials used for production of bio fuels.

    i)   What are bio fertilizers? List out micro-organisms used in their production.

    j)   Define biotransformation with suitable example.

    k)   Outline classification of alcoholic beverages based on distillation.

    l)   Mention any two differences between free cells and immobilized cells.

2. a)   Discuss the design of a typical fermenter.   (8+7=15)

    b)   Describe how fermentation product is recovered by downstream processing.

3. a)   Explain industrial production of citric acid. What are its uses?   (8+7=15)

    b)   Discuss microbial production, mode of action and applications of penicillin.

4. a)   Describe industrial production of ethanol from molasses.   (8+7=15)

    b)   Discuss production of biogas. What are its applications?

5. a) What are microbial poly saccharides? Mention their applications. (8+7=15)
   b) What is microbial mining? Explain.

6. a) Describe microbial degradation of xenobiotics. (8+7=15)
   b) Discuss various methods used in sewage treatment.

7. Write short note on **any Three** of the following. (3×5=15)
   a) Biosensors
   b) Bio surfactants
   c) Industrial production of amylase
   d) SCP

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PG2S-335-B-23
M.Sc. II Semester Degree Examination
BIOCHEMISTRY
Metabolism - I
Paper - HCT-2.2

Time : 3 Hours   **Maximum Marks :80**

Instructions to Candidate:

Answer question No.**1** and any **Four** of the remaining.

SECTION-A

Answer any **Ten** of the following: (10×2=20)

1. a) What is aspartate-malate shuttle? Give its significance.

    b) Differentiate between catabolism and anabolism with an example for each.

    c) Give the significance of amphibolic pathways in cellular metabolism.

    d) What are the symptoms of galactosemia?

    e) What are anaplerotic reactions? Give an example.

    f) Give the reaction catalysed by glycogen phosphorylase.

    g) What is futile cycle? Give its significance.

    h) What is oxidative phosphorylation? Give its importance.

    i) Define standard free energy and give its relevance in biochemical reactions.

    j) What is an uncoupler of oxidative phosphorylation? Give its mechanism.

    k) What is Hill reaction?

    l) How do you differentiate between C3 and C4 Pathways?

2. a) Discuss the enzymatic regulation of Glycolysis.   **(8+7=15)**

    b) What is gluconeogenesis? Give the gluconeogenic pathway reactions and compare its energetics with glycolysis.

3. a) Outline the reactions involved in citric acid cycle with its bioenergetics.   **(8+7=15)**

    b) Give an account on important glycogen storage diseases.

4. a) Describe the Pentose Phosphate Pathway of carbohydrate metabolism.   **(8+7= 15)**

    b) Explain the effects of hormones on glycogen metabolism.

5. a)   Give an account on F_0-F_1 ATPase Structure and function.
    b)   Discuss the importance of oxidation and reduction reactions in biology.   **(8+7=15)**

6. a)   What is RUBISCO? How does it work in photosynthesis process?
    b)   How does light and dark reactions work in photosynthesis? Explain.   **(8+7=15)**

7. Write short note on any **Three** of he following: **(3×5=15)**
    a)   Biosynthesis of peptidoglycans
    b)   Electron Transport Chain
    c)   Crassulacean acid metabolism
    d)   Glucuronate pathway

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PG2S-334-B-23
M.Sc. II Semester Degree Examination
BIOCHEMISTRY
Enzymology
Paper - HCT-2.1

Time : 3 Hours   Maximum Marks :80

Instructions to Candidate:

Answer question No.**1** and any **Four** of the remaining.

Answer any **Ten** of the following: (10×2=20)

1. a) What are multifunctional enzymes? Give example.

    b) How does ligand binding cause allosteric effect?

    c) What are hydrolases and lyases? Give example.

    d) How do noncompetitive inhibitors affect Vmax and Km?

    e) What are coupled enzyme assays? Give its importance.

    f) Define IU and Ketal.

    g) What are suicide inhibitors? Give their importance.

    h) How intracellular enzymes are localized.

    i) What are isoenzymes? How are they separated?

    j) Define Km and Vmax.

    k) What is pre-steady state kinetics? Give its importance.

    l) What are zymogens? How are they activated?

2. a) Describe in detail the nomenclature and classification of enzymes.   (5+5+5=15)

    b) Describe the mechanism of action of chymotrypsin.

    c) Describe the mechanism of action of RNase.

3. a) What is bi - substrate reactions? How do you distinguish between single displacement reactions with double displacement by isotope exchange methods?   (7+8=15)

    b) Give the importance of primary and secondary plots in bi-substrate reactions.

4. a) What are allosteric enzymes? Describe the allosteric regulation of ATCase enzyme.

   (5+5+5=15)

   b) Derive rate equation for a single substrate enzyme catalyzed reaction by King-Altman procedure.

   c) Discuss the regulation of enzyme activity by reversible covalent modification.

5. a) Define active site of an enzyme? How are amino acid residues cysteine, and serine identified at the active site? **(7+8=15)**

   b) Discuss the different types of feedback inhibition.

6. a) Explain briefly the procedure employed for the purification of enzymes. **(7+8=15)**

   b) Describe the assay of any two enzymes by spectrophotometric technique.

7. Write short note on any **Three** of the following: **(3×5=15)**

   a) MWC and KNF allosteric models

   b) Michaelis - Menten equation

   c) Clinical applications of enzymes.

   d) Adair equation

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