PG3S-381-A-23
M.Sc. III Semester (CBCS) Degree Examination
BIOCHEMISTRY
Metabolism II
Paper - HCT 3.1

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

Instructions to Candidates:

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

1.   Answer **any Ten** of the following: (10×2=20)
   a)   How is acetyl CoA produced in mitochondria?
   b)   Write the enzymatic steps of degradation of TAG.
   c)   What is the role of CO_2 in fatty acid biosynthesis?
   d)   What is metabolic water? Give an example for the production of the same.
   e)   How atmospheric ammonia is assimilated?
   f)   Define α oxidation of fatty acids and mention its biological significance.
   g)   What is cholelithiasis?
   h)   What is the function of THF? Enlist its derivatives.
   i)   Name the precursors of biosynthesis of purines and pyrimidines.
   j)   Write the mechanism of action of azaserine?
   k)   What is genetic defect in phenylketonuria? Mention the recommended treatment.
   l)   Give the molecular basis of albinism.

2.   a)   Enumerate the steps involved in the β-oxidation of palmatic acid and add a note on its energetics.
   b)   Discuss the biosynthesis of fatty acid.   (8+7=15)

3.   a)   Describe the biosynthesis and regulation of cholesterol
   b)   Explain the nitrogen cycle. Add a note on its importance in plants.   (8+7=15)

4.   a)   Explain the enzymatic steps involved in the biodegradation of arginine.
   b)   Discuss the mechanism of biosynthesis of lysine.   (8+7=15)

5.   a)   Write the steps involved in the biosynthesis of heme and its regulation.
   b)   Write the biochemical steps of purine biosynthesis.   (8+7=15)

6. a) Discuss the steps involved in the degradation of pyrimidines.
    b) Explain the biosynthesis and importance of NAD and FAD.   (8+7=15)
7. Answer **any Three** of the following   (3×5=15)
    a) Physiologically active amines.
    b) Errors of aromatic amino acid metabolism
    c) Inhibitors of purine biosynthesis
    d) Nitrogenase complex.

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PG3S-382-A-23
M.Sc. III Semester (CBCS) Degree Examination
BIOCHEMISTRY
Immunology
Paper - HCT 3.2

Time : 3 Hours   Maximum Marks : 80
Instructions to Candidates:
    Answer question No.**1** and any **FOUR** of the remaining.

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

    a)   What is a heptanes? Give example.

    b)   Write the characteristic features of hypervariable region.

    c)   Distinguish between primary and secondary immune responses.

    d)   What is SCID?

    e)   What is the difference between active and passive immunity?

    f)   Distinguish between allotypic and idiotypic variation.

    g)   What is complement? Give its function.

    h)   What are split genes?

    i)   What is autoimmunity? Give examples.

    j)   What is immunological tolerance?

    k)   Write the principle of ouchterlony double diffusion.

    l)   Distinguish between monoclonal and polyclonal antibodies.

2. a)   Discuss the alternate pathways of compliment activation. Mention the biological effect of compliment activation.

    b)   Classify antibodies. Describe the general structure of an antibody.   (8+7=15)

3. a)   Describe different types of immunity? Add a note on humoral immune response?

    b)   How are monoclonal antibodies produced? Discuss their applications.   (7+8=15)

4. a)   Discuss the mechanism of processing and presentation of antigens on MHC-II.

    b)   What is precipitin and agglutinin? Discuss different methods of precipitin and agglutinin reactions.   (7+8=15)

5. a) Discuss in detail the process of maturation of T-cells.

    b) Explain the principle, types and applications of ELISA.   (7+8=15)

6. a) Describe the process of immunoglobulin heavy chain gene rearrangement during B cell maturation.

    b) Explain Type I and Type IV hypersensitive reactions.   (7+8=15)

7. Write notes on **any THREE** of the following.   (3×5=15)
    a) Graft rejection.
    b) Vaccines.
    c) Allergy
    d) RIA.

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PG3S-383-A-23
M.Sc. III Semester (CBCS) Degree Examination
BIOCHEMISTRY
Clinical Biochemistry and Hormones
Paper - SCT 3.1

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidate:

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

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

    a)   What is ESR? Give its significance.

    b)   Give molecular basis of sickle cell anaemia.

    c)   What is Rh factor? Give its significance.

    d)   Differentiate between nephritic and nephrotic syndrome?

    e)   What is van den Berge reaction? Give its significance.

    f)   Differentiate kidney stones from gall stones on the basis of composition.

    g)   What is Lactose intolerance? Mention underlying cause.

    h)   Outline classification of lipoproteins.

    i)   Give molecular basis of Alkaptonuria.

    j)   What is glycated haemoglobin? Mention its normal range.

    k)   What are protoonco genes?

    l)   How do you classify hormones?

2. a)   Discuss mechanism of blood coagulation.

    b)   Give an account on pathophysiology of thalassemia.   (7+8=15)

3. a)   Outline classification of renal function tests. Add note on urea clearance test.

    b)   Discuss haemodialysis and peritoneal dialysis.   (8+7=15)

4. a)   Describe etiology and classification of diabetes mellitus. Add on its complications.

    b)   What are glycogen storage diseases? Discuss.   (8+7=15)

5. a)   Give an account on clinical significance of SGOT and SGPT.

    b)   What is Zollinger-Ellison syndrome? Discuss.   (8+7=15)

6. a) What are disorders of thyroid hormones? How do you diagnose them?
    b) Describe mechanism of action of steroid hormones.   (8+7=15)
7. Write note on any **THREE** of the following.   (3×5=15)
    a) PKU
    b) Cirrhosis
    c) Carcinogenesis
    d) Intestinal Hormones.

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PG3S-384-A-23
M.Sc. III Semester (CBCS) Degree Examination
BIOCHEMISTRY
Applied Biochemistry
Paper - OET 3.1

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

Instructions to Candidates:

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

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

   a)   What are enzymes?

   b)   Name two clinical enzymes and mention their importance.

   c)   Write the characteristics of industrial microorganisms.

   d)   What is downstream processing?

   e)   What is penicillin? How does it act?

   f)   Define single cell protein.

   g)   Hydrogen is a biofuel. Justify.

   h)   What are biofertilizers?

   i)   Write the principle and applications of GLC.

   j)   Write the principle and one application of SDS-PAGE.

   k)   What is biological leaching?

   l)   Define radioactivity.

2.   a)   Write a note on enzyme nomenclature.

     b)   Describe the biotechnological applications of enzymes.

     c)   Explain the methods of enzyme immobilization.   (3×5=15)

3.   a)   Write a note on secondary metabolites.

     b)   Explain the design and operation of fermenter.

     c)   Describe the process of solid state fermentation.   (3×5=15)

4. a) Describe the screening of antibiotic producers.
   b) Explain the mechanism of action of streptomycin.
   c) Write an account on steroid transformation. (3×5=15)

5. a) Describe production of alcohol from molasses.
   b) Explain the production of biogas.
   c) Write a note on production of citric acid. (3×5=15)

6. a) Describe gel permeation chromatography.
   b) Write a note on agarose gel electrophoresis.
   c) Write the applications of radioactivity in cancer therapy. (3×5=15)

7. Write note on **any THREE** of the following. (3×5=15)
   a) Applications of immobilized enzymes.
   b) Single cell proteins.
   c) Microbial Pesticides.
   d) Paper Chromatography.

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