

Q.P. Code: 25605**(3 HOURS)****[Total Marks: 80]**

- N.B.: 1) **All** questions are compulsory
 2) **Figures** to the **right** indicate **full** marks
 3) Draw neat, labelled diagrams wherever necessary.

Q 1 a) Answer the following**16**

- i) Define negative feedback mechanism of homeostasis
- ii) What is pinocytosis
- iii) Give location and function of Hyaline cartilage
- iv) Enlist components of lymphatic system
- v) Name the antigen and antibody present in following blood group: a) A (b) O
- vi) Enlist cardinal signs of Inflammation
- vii) Explain how Graves' disease leads to hyperthyroidism
- viii) Write classification of muscles

b) Answer the following**04**

- i) Give example of basic life processes
- ii) Deficiency of which nutrients cause megaloblastic anemia.
- iii) Name the factor involved in the pathogenesis of erythroblastosis fetalis?
- iv) What is isotonic contraction?

Q.2. a) Answer Any TWO of the following**08**

- i) Define Hemostasis. Explain the process of Platelet Plug Formation.
- ii) Classify White Blood Cells (WBCs). Name the respective conditions in which Neutrophil and Eosinophil count increases
- iii) Describe the process of hemoglobin synthesis

b) Write a short note on Any ONE of the following**04**

- i) Define Anemia and discuss different types of anemia
- ii) Thrombocytopenia and leucopenia.

Q.3. a) Answer Any TWO of the following**08**

- i) Explain various sources of energy for muscle metabolism.
- ii) Describe in detail the mechanism of skeletal muscle contraction.
- iii) Describe microscopic anatomy of skeletal muscle.

b) Answer Any ONE of the following**04**

- i) Explain Excitation - contraction coupling in skeletal muscle.
- ii) Draw a neat, labelled diagram showing organization of skeletal muscle

Q 4. a) Answer any ONE of the following**04**

- i) Draw a neat labelled diagram of lymph node. Discuss functions of lymphatic system
- ii) Discuss anatomy and functions of spleen

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b) Write a note on (any ONE)

04

- i) Myasthenia Gravis
- ii) Rheumatic fever

c) Answer any ONE of the following

04

- i) Classify connective tissue and give example and location of each type
- ii) Write a short note on Stratified Epithelium.

Q 5 a) Answer any ONE of the following

04

- i) Compare and contrast between the active and passive transport processes.
- ii) Explain the mechanism of pinocytosis in detail.

b) Answer any ONE of the following

04

- i) Draw a neat labelled diagram of the cardiac muscles. Give role of intercalated discs.
- ii) Explain the structure and function of neuromuscular junction.

c) Answer any ONE of the following

04

- i) Give significance of inflammation. Explain the role of histamine and Prostaglandins in inflammation.
- ii) Discuss the process of chemotaxis

Q 6 a) Answer any TWO of the following

08

- i) Describe the process of erythropoiesis.
- ii) Write a note on autoimmunity.
- iii) Write a note on hypersensitivity reactions.

b) Answer any ONE of the following

04

- i) Compare and contrast between Acute and Chronic inflammation
- ii) Discuss various vascular changes during inflammation.

(3 hours)

Total Marks: 80

N.B.: All questions are compulsory

- Q. 1 a) Draw the structure of α - D glucose by using Haworth projection formula 1
 b) Draw the structure of D-ribose by using Fischer projection formula 1
 c) Give the name and three letter code of an amino acid containing aromatic ring 1
 d) Explain anabolism with example 1
 e) Enlist water soluble vitamins 1
 f) Define isoelectric pH 1
 g) Give the structure of coenzyme of Vitamin B₆ 1
 h) Name the purine nitrogenous bases 1
 i) Draw the structure of sucrose 1
 j) Draw the structure of cephalin 1
 k) Draw the structure of ADP 1
 l) Deficiency of Vitamin-D leads to..... 1
 m) Give the name and draw the structure of acidic amino acids 2
 n) Differentiate between non reducing disaccharides and reducing disaccharides 2
 o) Enlist essential amino acids 2
 p) Explain the primary structure of proteins 2
- Q. 2 a) Explain the β - plated secondary structure of proteins 3
 b) Explain NADH as energy carrier 3
 c) Discuss the biochemical role Vitamin –B₂ or Vitamin –B₁ 3
 d) Write a note on nucleoside and nucleotide 2
 e) Enumerate salient features of digestion of fatty acid 1
- Q. 3 a) Write a note on polysaccharides 3
 b) Write a note on biochemical role of Vitamin- A or Vitamin –D 3
 c) Explain Watson and crick model of DNA with diagram 3
 d) Explain standard free energy and transformed free energy 2
 e) Comment on conversion of glucose to energy in RBCs 1
- Q. 4a) Classify amino acids based on functional group with examples (No structures required) 3
 b) Write a note on phospholipids 3
 c) Discuss the biochemical role B-9 3
 d) Write a note on Vitamin-B₃ or Vitamin –B₁₂ 2
 e) State second law of thermodynamics 1
- Q. 5 a) Write a note on polysaccharides 3
 b) Write a note on Vitamin- B5 or Vitamin –B7 3
 c) Write a note on Vitamin –C 3
 d) Draw the structures of two monounsaturated fatty acid 2
 e) Write salient features of protein digestion 1
- Q. 6 a) Explain melting and annealing of DNA 3
 b) Write a short note on Vitamin-K or Vitamin –E 3
 c) Write a note on Triglycerides 2
 d) Explain thermodynamically unfavorable reaction 2
 e) Write a note on rancidity 2

Q. P. Code: 22581**(3 Hours)****Total Marks: 80**

- N.B.:** (1) All questions are compulsory
 (2) Answer all sub questions together
 (3) Figures to right indicate full marks

Q.1 (a) Explain the terms (Any 5)

- Radioactivity
- Antiseptic
- Hypocalcemia
- Half life
- Principal Quantum Number
- Sclerosing agent

b) Answer the following (Any 5)

- What are physiological functions of zinc?
- Draw Lewis structure for PO_4^{3-} and HNO_3
- Give ground state electronic configuration of Neon and Potassium.
- Explain phase transfer catalysis in brief.
- Enlist ionic composition of the body fluids and state the significance
- Arrange the following compounds in increasing order of s-character:
 CH_4 , PCl_5 , SF_6 , BeF_2

c) Match the following**Column A**

- HPO_4^{2-}
- Zinc oxide
- Roentgen
- NH_3
- Sodium potassium tartrate

Column B

- Rochelle salt
- Topical protective agent
- Principal intracellular anion
- Exposure dose
- Triagonal pyramidal

Q.2 a) What is Kinetic isotope effect? Why kinetic isotopic studies are performed? How to express it, explain with suitable example?**b) Answer the following (Any 2)**

- Give the uses of Talc and potassium permanganate.
- What are expectorants? How do they act?
- Write a note on antioxidants?

Q. P. Code: 22581c) **Fill in the blank:**When $^{226}\text{Ra}_{88}$ emits -----the atomic number decreases by _____ and atomic mass

number decreases by _____ of resulting nuclei

2

d) Define hyponatremia. What are its causes?

2

Q.3 a) What is catalysis? Give its principle and elaborate on covalent catalysis

4

b) Classify gastrointestinal agents. Elaborate on saline cathartic with suitable example.

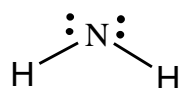
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c) Define Inductive effect and electronic configuration.

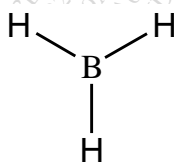
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d) Calculate the formal charge on central atom (Any 2)

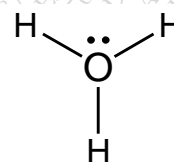
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(i)



(ii)



(iii)

Q.4 a) Complete the following table on the basis of hybridization concept.

4

Molecule	Hybridized state of <u>underlined atom</u>	Bond angle
<u>PCl</u> ₅		
<u>CH</u> ₃ -CH ₃		
<u>Al</u> Cl ₃		
<u>S</u> F ₆		

b) Classify and Give mechanism of action of following agents

4

Zinc peroxide, Silver nitrate, Titanium dioxide, Povidone iodine

c) State and explain the Curtin-Hammet principle.

2

d) In the Sulphonation of naphthalene, identify which is a kinetically controlled and which is thermodynamically controlled product.

2

Q. P. Code: 22581**Q.5 a) State true or false. (Any 4) 4**

- i) Electronegativity is related to ionization energy and electron affinity.
- ii) Bond angle of BF_3 is 180° by hybridization theory.
- iii) Red colour in electrostatic potential surface indicate electronegative region.
- iv) $\text{H}_2\text{C}=\text{CHCl}$ behaves as nonpolar molecule

b) Write a note on specific acid catalysis or general base catalysis. 4**c) Define antidote. Classify them based on mechanism of action with suitable example. 2****d) Define buffer capacity and buffer action. Enlist different physiological buffers that maintains physiological acid-base balance. 2****Q.6 Answer the following (Any 6) 12**

- i) Calculate rate constant and half-life for first order reaction, if 90% of substance reacted within 10 min.
- ii) Write a note on electrolyte replacement therapy.
- iii) Enlist biochemical functions of copper.
- iv) Discuss the biological effect of radiation.
- v) Give any four clinical application of I-131.
- vi) The half-life of Zn-71 is 2.4 minutes. If a patient had 100 mg at the beginning, how many grams would be left over after 7.2 minutes has elapsed?
- vii) Draw the reaction coordinate diagram for two step exothermic reaction and show which is a rate determining step