<div align="center">

(Time: 3 Hours)   **[Total marks: 70]**

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N.B: (1) **All** questions are **Compulsory**
         (2) Answer **all** sub questions **together.**
         (3) **Draw neat labeled diagram wherever necessary.**

1. (a) Answer the following   12
   i.   Give location and function of Areolar connective tissue
   ii.   What is pinocytosis
   iii.   Enlist functions of lymphatic system.
   iv.   Enlist the cardinal signs of Inflammation
   v.   Write the classification of muscles.
   vi.   What is erythroblastosis fetalis

   (b) **Answer the following**   3
   i.   Deficiency of which nutrients cause megaloblastic anemia.
   ii.   Holding a book with stretched hand in steady position is _____ type of contraction.
   iii.   Enlist various cellular organelles.

2. (a) Answer any **TWO** of the following.   8
   i.   Write a short note on Life Cycle of RBC.
   ii.   Classify White Blood Cells (WBCs). Name the respective conditions in which Neutrophil and Eosinophil count increases.
   iii.   Explain in brief Thrombocytopenia and leucopenia.

(b) Answer any **ONE** of the following.   3
   i.   Write a note on Leukemia
   ii.   Explain pathophysiology of megaloblastic and pernicious anemia.

3. (a) Answer any **TWO** of the following.   8
   i.   Write a note on cardiac muscles.
   ii.   Describe in detail Neuromuscular Junction
   iii.   Distinguish between skeletal muscle and smooth muscle.

(b) Answer any **ONE** of the following   3
   i.   Draw a neat, labeled diagram showing organization of skeletal muscle.
   ii.   Write a note on isotonic and isometric contractions.

4. (a) Answer any **ONE** of the following.   4
   i.   Discuss anatomy and functions of spleen
   ii. Explain the process of formation and flow of lymph.

(b) Answer any **ONE** of the following   4
   i. Explain the term Auto-immune disease. Give pathophysiology of Rheumatoid arthritis.
   ii. Write a note on Myasthenia Gravis.

(c) Answer any **ONE** of the following 3
   i.   Draw a neat labeled diagram of Stratified squamous epithelium, discuss their location and functions
   ii. Write a short note on Extracellular Matrix of connective tissue.

5. (a) Answer any **ONE** of the following. 4
   i.   Write a detail account on passive transport mechanism across membrane.
   ii. Explain the process of osmosis.

(b) Answer any **ONE** of the following 4
   i. Give location and function of different types of muscles.
   ii. Explain following terms
        a.   Nuromuscular Junction
        b.   Muscle tone

(c) Answer any **ONE** of the following 3
   i.   Compare and Contrast between Acute and Chronic type of Inflammation.
   ii. Explain in brief the process of tissue repair.

6. (a) Answer any **TWO** of the following. 8
   i.   Explain terms   a) Thrombocytopenia   b) Leukemia
                         c) Polycythemia vera   d) Anaemia
   ii. Explain the process of synthesis of RBCs.
   iii. Enlist functions of various components of blood.

(b) Answer any **ONE** of the following 3
   i. Discuss various vascular changes during inflammation.
   ii. Define inflammation, phagocytosis, and exudate

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Q.P. Code : 02737

[Time: 3 Hours]   [Marks:70]

Please check whether you have got the right question paper.

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

1.	i)	Justify the need for use of renewable sources of energy.	**2**
	ii)	Explain the need of environmental education.	**2**
	iii)	Give two benefits of Green buildings.	**2**
	iv)	Explain secondary air pollutants with examples.	**2**
	v)	What do you mean by vermicomposting?	**2**
	vi)	Enlist two non-renewable sources of energy.	**1**
	vii)	Define: Photochemical smog	**1**
	viii)	Explain the term Environmental Impact Assessment(EIA)	**1**
	ix)	Define examples of indoor air pollutants with its effect on human body.	**1**
	x)	Define Carbon credit.	**1**

2.	i)	Write the causes and effects of depletion of soil resources and measures undertaken for prevention of same.	**4**
	ii)	Give the roles and duties of Central Pollution Control Board.	**4**

OR

Give the roles and duties of State Pollution Control Board.

	iii)	Why is depletion of ozone layer a major environmental hazard.	**3**

3.	i)	Describe the types of ecosystem and functional components of ecosystem alongwith examples.	**4**
	ii)	What is wind energy and explain the working of hydropower generation	**4**

OR

What is geothermal energy? What are its forms and enlist its applications.

	iii)	Describe the need of public awareness for environment	**3**

4.	i)	Write short note on causes and effects of acid rain	**4**
	ii)	Give reason. Indoor air pollution is minimized by green buildings	**2**
	iii)	Describe the control measures for sustainable development	**2**
	iv)	Discuss the entire procedure for obtaining environmental clearance	**3**

OR

Explain "Taj Mahal" as a case study in environmental legislation.

TURN OVER

2

5.   i)   Explain Minamata disease case study   **4**

OR

What are the causes and effects of noise pollution

ii)   Write a note on techniques of disaster management with reference to earthquake   **4**

iii)   Explain the resource utilization as per the carrying capacity   **3**

6.   i)   Describe the causes and effects of depleting nature of forests on the environment.   **4**

ii)   With a neat labelled diagram explain principle and working of photovoltaic cell.   **4**

OR

With a neat labelled diagram explain principle and working of flat plate collector.

iii)   Classify municipal solid waste. Explain incineration as one of the methods of solid   **3**
waste management.

_____

(3 hrs)

[Total Marks 70]

N.B. 1. All Questions are compulsory.
    2. Figure to right indicate full marks

Q1. A. Explain the following terms (any five) `   5

    1. Polar covalent bond
    2. Heterogeneous catalyst
    3. Inductive effect
    4. Charge transfer complex
    5. First order reaction
    6. HOMO

 B. Fill in the blanks (any five)   5
    1. Ground state elect electronic configuration for Magnesium is--------
    2. Lewis structure for Nitric acid (HNO_3) is **--------**
    3. ---------- Orbital shows only one node
    4. Tetracyanoethylene is an excellent acceptor, and it forms **------**with electron   rich systems such as hexamethylbenzene.
    5. The formula for calculation of half-life for first order reaction is--------
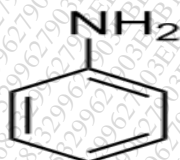   **6.** Crown ether is an example of --------

 C. Match the following   5

    1. $dx^2\text{-}y^2$ a) Charge transfer
    2. Carbon in alkane   b) example of specific base
    3. Starch iodine complex   c) sigma symmetry
    4. OH-   d) $3d^7 4s^2$
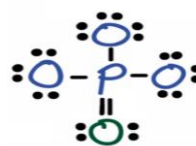   **5.** valence electron of Co (27)   e) sp^3

Q2. A. Draw the resonating structures for   2

    a.   b.

Q2. B. Draw Molecular orbital diagram for Ethane. Indicate **HOMO** and **LUMO.**   **3**

C. Fill in the blanks on the basis of Kinetic isotopic effect.   **3**

1. When k_H/k_D is greater than one, we call the isotope effect --------.and when k_H/k_D is less than one, we call the isotope effect --------

2. ------- element shows highest isotope effect

3. When isotope effect is seen not at rate determining step is called --------

D. Define turn over number. Explain metal ion catalysis with example.   **3**

Q3. A. Give Erying equation and Arrhenius rate law. Clearly name each term involved in expression   **3**

B. Calculate rate constant in hr^{-1} for the first order reaction with half life of 360 min   **2**

C. Define group orbital. Mention symmetry elements of MH_3 system. Enlist molecular orbitals for ammonia

D. Compare the energy of linear and bent form of MH_2 system using molecular orbital diagram   **3**

Q4. A. Discuss molecular orbital theory   **3**

B. What do you mean by second order mixing? State any four rules of QMOT.   **3**

C. Define fast kinetics. Enlist the method to study fast kinetics. Explain any one.   **3**

D. What is phase transfer catalysis? Give examples.   **2**

Q5. A. State true or false   **3**

i)   Bond length for an alkane is larger than alkene
ii)   KCl is less polarizable than NaCl
iii)   Group electronegativity for nitro group is lower than chloro

B. Define reaction intermediate. Explain formation of any one.   **3**

C. A first order reaction was found to have energy of activation of 2.15×10^4 J/mol. Calculate the temperature at which reaction will have a rate constant of 0.030 sec^{-1}.Frequency factor $A=5 \times 10^{13}$ sec^{-1} and R= 8.314 J/kmol.   **2**

D. Write a short note on Charge transfer complexes.   **3**

Q6. A. Complete the following table on the basis of hybridization. 3

Molecule	Hybridized state of underlined atom	Bond angle
$\underline{S}F_6$		
$\underline{C}H_2=CH_2$		
$\underline{Be}F_2$		

B. Write a short note on general acid catalysis. 4

C. Explain Kinetics vs thermodynamics control of reaction with suitable example. 4