- **All questions are compulsory.**
- **Draw diagram wherever necessary**

Q I.(A) Give the function of the following(any two). **(4)**

1. Primase 2. DnaB 3. DNA pol 1 4. SSB proteins

QI.(B) Explain the following (any two). **(4)**

1. Lagging strand 2. Proof-reading activity 3. Replisome 4.Template DNA

QI.(C) Answer any two of the following. **(12)**

1. Give an account of the experiment which provided that DNA replication takes place by semi-conservative mode.
2. Explain in detail the Θ (theta) model of DNA replication.
3. Write a note on DNA polymerases of *E.coli*
4. Explain the semi discontinuous mode of DNA replication

QII. (A) State whether the following statements are true or false. (any two). **(2)**

1. Photoreactivation occurs when and enzyme called amylase is activated by a photon of light.
2. DNA polymerase removes wrong nucleotide by its exonuclease proofreading activites.
3. Nonreciprocal intrachromosomal translocation involves exchange of gene segments in same chromosome.
4. Cri-du-chat syndrome is an example of deletion mutation.

QII.(B) Explain the following terms. (any three) **(6)**

1. Transition mutation.
2. Transversion mutation
3. chromosomal mutation
4. Silent mutation
5. Neutral mutation
6. Missense mutation

QII.(C) Answer any two of the following. **(12)**

1. Write a note on Mismatch Repair by DNA polymerase proofreading activity.
2. Illustratively explain types of inversion mutation.
3. Repair by Methyl-Directed Mismatch repair.
4. Explain about translocation mutation with types.

Q III (A) Explain the terms (any three) **(06)**

1. Proband 2. Tetrad analysis 3. Ascus
4. Repulsion phase 5. Holandric trait 6. Linked genes

Q III B) Give symbols used in pedigree for (any two) of the following **(02)**

1. Proposita 2. Consanguineous marriage 3.Carrier female 4. Affected male

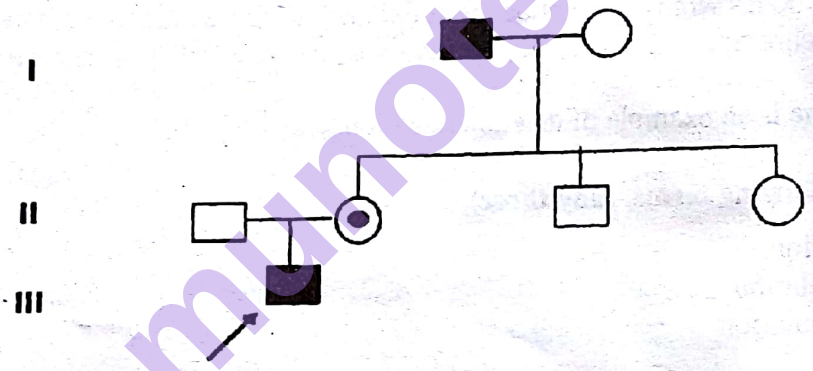
(12)

Q III C) Attempt (any two) of the following

1. Describe the Holliday model of recombination.
2. Illustrate mapping of linked genes in diploid eukaryotes using a three point test cross.
3. Solve:- A *Neurospora* strain that required leucine (leu) and tryptophan (trp) for growth was mated to a wild type strain (leu + and trp+) following products were obtained. Compute the distance between the two linked genes

	1	2	3	4	5	6	7
Spore pair 1	leutrp	leu +	leutrp	leutrp	leutrp	leu +	+ trp
Spore pair 2	leutrp	leu +	leu +	+ trp	+ +	+ trp	+ +
Spore pair 3	+ +	+ trp	+ trp	leu +	leutrp	leu +	Leutrp
Spore pair 4	+ +	+ trp	+ +	+ +	+ +	+ trp	leu +
TOTAL	**50**	**2**	**15**	**8**	**10**	**10**	**5**

4. Observe the following pedigree and answer the following questions:- A person has a history of colour blindness in his family given is his pedigree chart



i. Which individual is the proband?
ii. What is the mode of inheritance?
iii. Explain criss –cross inheritance?
iv. Give clinical condition of the disease?
v. Which generation progeny is the carrier female?
vi. What is the percentage of daughters affected if the carrier female marries a normal male?

Q IV. Write a note on (any Three) of the following. (15)

1. Initiation of replication in eukaryotes
2. Rolling circle mode of replication
3. DNA replication errors.
4. Radiation as an induced mutagen.
5. Corn experiments to prove chromosomal exchange during crossing over.
6. Importance of pedigree analysis

—— The End ——