

- Note: 1) All questions are compulsory.
 2) Figures to Right indicate marks.
 3) Draw diagram wherever necessary.

Q. I.A. Answer the following questions (any 4) [8M]

1. State Gregor Mendel's law of dominance.
2. Define homozygote
3. Define Over-dominance.
4. What is selfing?
5. Mention two differences between dominant trait and recessive trait.
6. What is gene?
7. Define epistasis
8. Define test cross.

Q. I.B. Answer the following questions in brief (any 2) [6M]

1. Define multiple alleles. Explain with an example.
2. What is incomplete dominance? Explain with an example.
3. Why Mendel has chosen pea plant for his experiment-explain with reason.
4. A cross between round radishes (RR) and long radishes (LL) produces oval radishes (RL). What would the offspring be like if you crossed a round radish and an oval radish?

Q. I.C. Answer the following questions in detail (any 1). [6M]

1. Explain correspondence between Mendelian factors and chromosomes.
2. In addition to colour in summer squash, it is known that disk shape is dominant to sphere shape. A cross between a plant with white disk fruit and one with yellow sphere fruits yielded 25 plants with white disk, 26 plants with white sphere, 24 with yellow disk, and 25 with yellow sphere fruits. If the white disk parent is self-fertilized, what proportion of its offspring will have yellow disk fruits?

Q.II.A. Answer the following (any 4) [8M]

1. What is chromatid?
2. Give a short note on non-histone proteins.
3. What are auxotrophs? Explain with a suitable example.
4. Define conjugation and give its significance.
5. Give a short note on Hfr strain.
6. What is a difference between generalized transduction and specialized transduction?
7. Give differences between DNA and RNA.
8. Give short note on anaphase I of meiosis.

Q.II.B. Answer the following (any 2) [6M]

1. Explain- lytic cycle in E.coli.
2. Explain gene segregation in meiosis.
3. Explain- structure of eukaryotic chromosomes.
4. Give a short note on 'sex factor F'

[6M]

Q.II.C. Answer the following (any 1)

1. Explain- Transformation in *Streptococcus pneumoniae*.
2. Give characteristics of Watson and Crick's model of DNA and explain three types of DNA

[8M]

Q. III. A. Answer the following (any 4)

1. What are the different kinds of membrane transport proteins? Name any two.
2. Comment on the selective permeability of the plasma membrane.
3. What kind of molecules can diffuse across a lipid bilayer without the help of transport proteins?
4. Explain the term passive diffusion.
5. Explain the term carbamino-haemoglobin.
6. Explain the term influx.
7. Explain the term phosphorylation.
8. Explain the term net flux.

[6M]

Q. III. B. Answer the following (any 2)

1. Diagrammatically explain pinocytosis.
2. Explain the term receptor mediated endocytosis.
3. Write in brief about transportation of oxygen with respect to blood.
4. Write a note on dissociation curve for oxygen.

[6M]

Q. III. C. Answer the following in brief (any 1)

1. Compare and contrast between passive diffusion and facilitated diffusion.
2. Explain in brief about active transport of glucose from intestinal lumen.

Q.IV.1.A. Answer in short. (any 1)

1. Law of segregation.
2. Define back cross

[2M]

Q.IV.1.B. Answer the following in one line. (any 3)

1. Who is father of genetics?
2. Give the ratio of F₂ generation of monohybrid cross.
3. Define hypostatic gene.
4. Human blood group shows which type of dominance?
5. Give an example of maternal effect.
6. Define dominant allele.

[3M]

Q.IV.2.A. Answer the following (any 1)

1. Define- nucleoside
2. Define- homologous chromosomes.

[2M]

Q.IV.2. B. Fill in the blanks (any 3)

1. _____ is a genetic material of all living organisms and some viruses. (RNA, DNA, mRNA)

[3M]

2. The non-histones are _____ from cell to cell within an organism. (vary, constant, non-conserved)
3. The _____ region of each eukaryotic chromosome is responsible for the accurate segregation of the replicated chromosome to the daughter cells during mitosis and meiosis. (telomere, centromere, ribosomes)
4. In _____, the F factor can integrate into the bacterial chromosome. (F+, F-, Hfr)
5. In transduction, the transfer of genetic material is _____. (Unidirectional, bidirectional, multidirectional)
6. _____ eukaryotic cells have two haploid sets of chromosomes. (diploid, haploid, triploid)

Q.IV.3.A. Answer the following (any 1)**[2M]**

1. Explain the term exocytosis.
2. Explain MDR transporter.

Q.IV.3. B. Fill in the blanks (any 3)**[3M]**

1. Individuals suffering from the following inherited disease are unable to transport certain amino acids. (Gout, polyuria, Cystinuria)
2. proteins are responsible for the facilitated diffusion of amino acids and nucleosides across the plasma membrane. (Channel, carrier, Glucose transporter)
3. The cell organelle combines with vesicle in phagocytosis. (lysosome, phagolysosome, nucleus)
4. The energy currency used in the active transport is..... (ADP, ATP, AMP)
5. is much more soluble in blood than oxygen. (Carbondioxide, Nitrogen, Methane)
6. Uniport transport only a molecule across the membrane. (Single, Double, three)

— The End —