

FIVE-YEAR INTEGRATED M.Sc., EXAMINATION 2021-2022

SEMESTER - VII

Paper code: LS-4-7-5

Paper: Evolution

Time: Three hours

Full marks: 40

Questions are of value as indicated in the margin.

Answer Question No.1 and any three from the rest.

1. Write short notes on *any ten* of the following

10x1 = 10

- a) Neutral evolution
- b) Molecular clock
- c) Sewall Wright effect
- d) Gene pool
- e) Gene frequency and genotype frequency
- f) Hardy Weinberg equilibrium
- g) Coacervation
- h) UPGMA
- i) *Homo erectus*
- j) Mesozoic era
- k) modern synthesis of evolution
- l) Struggle for existence

2. What is genetic drift? How genetic drift change the gene frequency when population is small and when population is large. Explain with example. 10

3. What do you mean by geological time scale? Write about major events in organismal evolution in relationship to geological time scale. 10

4. Reconstruct evolutionary history (gene tree) from molecular sequence provided

10

Human (Hu)	MVHLTPEEKSAVTALWGKVNVDVGGGEALGRLLVVYPWTQRFFESFGDLS
Baboon (Ba)N.....D.....
Cow (Co)	---A...A...F...K.....
Sheep (Sh)	---A...A...GF...K...A.....H.....
Mouse (Mo)DA...A...SG.....A.....Y...D.....
Hamster (Ha)DA...AL...G.....A...A...A.....H.....
Chicken (Ch)	...W...A...QLI...G.....A...C...A...A...I.....A...N...

5. i) Name the factors that deviate Hardy Weinberg equilibrium.

1+3+3+3 = 10

ii) If the gene frequency of a recessive allele t is 0.2 what will be the percentage of individual in genotype TT, Tt, tt?

iii) What is the frequency of heterozygote 'Aa' in a random mating population in which frequency of all dominant allele is 0.19?

iv) What is the frequency of heterozygote 'Aa' in a random mating population if the frequency of recessive phenotype 'aa' is 0.09?

6. Explain the four main stages during the evolution of man.

10