

M.Sc. ZOOLOGY
Third Semester (Repeat)
GENETICS & EVOLUTION
(MSZ - 11)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

Answer any four from Question no. 2 to 8
Question no. 1 is compulsory.

1. What is the difference between macro and micro evolution? State the various types of Micro Evolution. State the significance of macro evolution. (1+4+5=10)
2. What is meant by Cell cycle Checkpoint? How does the activity of Anaphase Promoting Complex, Cyclosome (APC/C) leads to the separation of sister chromatids? (3+7=10)
3. What are the factors responsible for autosomal chromosome aberration in number? Discuss the causes of and clinical syndrome of Down syndrome. (5+2+3=10)
4. What is meant by DNA packaging? Describe the various steps of DNA packaging leading the process Inactivation in the metaphase stage of a given cell. (2+6+2=10)
5. Define Somatic cell fusion. How do propagate somatic cell fusion in HAT medium? State the significance of HGPRT enzyme system (Strain) for the culture of somatic cell hybrids. (2+3+5=10)
6. Explain about the origin of life with reference to its evolution of prokaryotes and eukaryotes. How Prokaryotic and eukaryotic evolution leads to the diversity of plants and animals. (5+5=10)

7. Prepare a phylogram from the sequences given below using both UPGMA and maximum parsimony methods. (10)

	1	2	3	4	5	6	7	8	9
Human	G	T	C	A	C	A	T	G	T
Chimpanjee	C	T	C	A	C	A	T	C	T
Gorilla	C	A	C	C	C	A	T	T	C
Orangutang	A	A	A	C	C	A	G	C	C

8. What is speciation? What are the different types of speciation? Explain with examples. (2+4+4=10)

M.Sc. ZOOLOGY
Third Semester (Repeat)
GENETICS & EVOLUTION
(MSZ - 11)

Duration: 20 minutes

Marks – 20

(PART A - Objective Type)

I. Tick (✓) the correct answer:

1×20=20

1. The telemetric region of a chromosome is
 - (a) repetitive sequence
 - (b) RNA sequence
 - (c) contains heterochromatin region
 - (d) condensed with H₂A

2. H₁ in the nucleosome formation acts
 - (a) to form dimeric structure
 - (b) as linker in the octomere
 - (c) itself in octomeric region
 - (d) carrying high molecular weight

3. DNA evidences refers to
 - (a) Genetic character
 - (b) Mutation
 - (c) Divergence of common ancestor
 - (d) None of these

4. Evolution has taken place over
 - (a) Hundred years
 - (b) Thousand years
 - (c) Million years
 - (d) Billion years

5. Older fossils are found
 - (a) in the deepest rock layers.
 - (b) in the shallowest rock layers.
 - (c) only in rocks over 1 million years old.
 - (d) evenly dispersed in all rock layers.

6. XY- male and XY- female are very in humans. They are due to-
- (a) Genes of Y chromosome are on X chromosomes.
 - (b) Crossing over between X and Y.
 - (c) Non-disjunction of chromosomes.
 - (d) All of the above.
7. Which of the following statements regarding X- inactivation in mammal is false?
- (a) The process is entirely random.
 - (b) X- Inactivation may occasionally occur in males.
 - (c) This ensures a homogeneous phenotype in heterozygote.
 - (d) X- inactivation occurs early in embryonic development.
8. In a given CPG strand in the promoter region of a gene is characterized by
- a) They are arranged linearly.
 - b) Arranged in the form of diestric bond between C and G.
 - c) Arranged in complementary manner.
 - d) All of these.
9. First life originated on Earth was
- a) Chemoautotrophs b) Bacteria
 - c) Autotrophs d) Photoautotrophs
10. The effects of natural selection may be countered by
- a) Gene flow b) Genetic drift
 - c) Mutation d) None
11. Motoo Kimura's theory that opposed Natural selection was the
- a) Natural theory b) nearly neutral theory
 - c) Neutral theory d) Adaptive theory
12. The random loss of allele in a population is called
- a) Mutation b) Selection
 - c) Genetic drift d) None

13. The movement of new genes into a population as a result of migration or hybridization is called

- a) Founder principle b) Selection c) Bottleneck effect d) Adaption

14. A species inhabiting same geographical area with different species is known as

- a) Sympatric b) Allopatric c) Sibling d) Biospecies

15. The Mutation may be described as

- a) Continuous genetic variation b) Phenotypic change
c) Discontinuous genetic variation d) Change due to hybridization

16. Genetic drift is found in

- a) Small population with or without mutated genes.
b) Large population with random mating.
c) Plant population.
d) Animal population.

17. How many DNA molecules are present in the nucleus of a human somatic cell in G₂ stage of cell cycle?

- a) 23 b) 46 c) 69 d) 92

18. The diagrammatic representation of karyotype (morphological representation of chromosomes) of a species is called-

- a) Cladogram b) Idiogram c) Ecogram d) Chromogram

19. Patau's syndrome occurs due to-

- a) Trisomy of 13th chromosome b) Trisomy of 18th chromosome
c) Trisomy of 21st chromosome d) Trisomy of 22nd chromosome

20. The loss of genetic variation that occurs when a new population is established by a very small number of individuals from a larger population is called

- a) Bottle neck effect b) mutation
c) genetic recombination d) founder effect
