

**M.Sc. ZOOLOGY**  
**THIRD SEMESTER**  
**GENETICS & EVOLUTION**  
**MSZ-301**

**Duration: 3 Hrs.**

**Marks: 70**

PART : A (OBJECTIVE) = 20  
PART : B (DESCRIPTIVE) = 50

**[ PART-B : Descriptive ]**

**Duration: 2 Hrs. 40 Mins.**

**Marks: 50**

**[ Answer question no. One (1) & any four (4) from the rest ]**

1. What is the difference between macro and micro evolution? State the various types of Micro Evolution. State the significance of macro evolution and evolutionary synthesis. (2+4+4=10)
2. What are the patterns of inheritance of Dominant & Recessive Traits? How is pedigree helpful in Genetic Counselling? (10)
3. What is the Etiology (cause) of Chromosomal disorders? Explain any one of the disorder in details. (10)
4. Explain the various theories of mechanism of speciation. (10)
5. What are Cro-Magnons? Explain with suitable example for the successful evolution of Cro-Magnons in the Human Evolution. (10)
6. Define Stromatolites. How does fossil presents the evidence of evolution? Briefly explain the origin of life on the basis of Oparin and Haldanes theory. (10)
7. What is meant by Dosage Compensation? Explain the mechanism of inactivation of X chromosome in human female. (10)
8. What are Cell Cycle Checkpoints? Explain how APC/C helps in regulation and separation of sister chromatids to progress cell into Anaphase. (10)

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**[ PART-A : Objective ]**

**Choose the correct answer from the following :**

**1×20=20**

1. Cystic Fibrosis is a kind of:
  - a. Autosomal disorder.
  - b. Chromosomal Disorder.
  - c. Metabolic Disorder.
  - d. None of these.
2. Achondroplasia means:
  - a. Werewolf Syndrome
  - b. Dwarfism
  - c. Hypertrichosis
  - d. None of these
3. HAM F 10,TC99 used in Karyotyping are:
  - a. Antibiotics
  - b. Phytohaemagglutinin
  - c. Culture Medium
  - d. None of these
4. What do the following symbols used in a pedigree chart signifies?  

  - a. Carrier Individuals
  - b. Unaffected Individuals
  - c. Dead Individuals
  - d. None of these
5. Which of the following describes gene flow?
  - a. Random mating
  - b. Migration
  - c. Genetic drift
  - d. Selection
6. In the process of evolutionary changes, the resultant alterations and loss of genetic variability has been termed as:
  - a. Genetic drift
  - b. Bottleneck effect
  - c. Mutation
  - d. Founder effect
7. The effects of natural selection may be countered by:
  - a. Gene flow
  - b. Genetic drift
  - c. Mutation
  - d. None of these
8. The occurrence of large or small beak sizes among seed crackers in the absence of medium sized beaks is an example of:
  - a. directional selection
  - b. stabilizing selection
  - c. disruptive selection
  - d. none of the above
9. Why is genetic polymorphism important to evolution?
  - a. Genes cannot mutate unless they are polymorphic.
  - b. Individual variety provides the raw material for natural selection to act on.
  - c. Only heterozygous populations are selected in natural populations.
  - d. None of these.
10. The microevolution is associated with the process of:
  - a. Mutation, recombination and natural selection.
  - b. Recombination, allele frequency suffling and natural selection.
  - c. Mutation, selection, gene flow, genetic drift and gene migration.
  - d. None of these.
11. Which one of the following statement is incorrect?
  - a. Genetic drift is an evolutionary force operating in small population.
  - b. Genetic drift is random.
  - c. It supports Hardy Weinberg equilibrium.
  - d. It fixes new alleles.
12. The new species which has established in different ecological niches within the normal parental population is called:
  - a. Parapatric
  - b. Allopatric
  - c. Sympatric
  - d. Peripatric



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13. In a population, 600 individuals have MM blood group, 100 have NN blood group and 300 have MN blood group. What will be the frequency of M and N alleles in this population?
  - a.  $A=0.08$  and  $a=0.14$
  - b.  $A=0.63$  and  $a=0.36$
  - c.  $A=0.68$  and  $a=0.32$
  - d.  $A=0.68$  and  $a=0.14$
  
14. The *Ramapithecus* were more close to:
  - a. Gibbon                      b. Orangutan
  - c. Gorilla                      d. Chimpanzee
  
15. Which of the following is the earliest known Hominid fossil?
  - a. *Homo ergaster*
  - b. *Australopithecus anamensis*
  - c. *Ardipithecus ramidus*
  - d. *Ramapithecus paranthropus*
  
16. The earliest known Australopithecine fossil belongs to:
  - a. *Australopithecus anamensis*
  - b. *Australopithecus boisei*
  - c. *Australopithecus afarensis*
  - d. *Australopithecus robustus*
  
17. \_\_\_\_\_ evolved in Africa and migrated from there to Asia, Europe.
  - a. *Homo sapiens*
  - b. *Homo neanderthalensis*
  - c. *Homo heidelbergensis*
  - d. *Homo erectus*
  
18. When would a Cyclin B break?
  - a. During Prophase                      b. During Anaphase
  - c. During Metaphase                      d. During G1/M transition
  
19. Which of the following controls the cell cycle progression from G2 to M phase?
  - a. Cyclin-cdk
  - b. Cyclin
  - c. Cell Adhesion Molecule
  - d. cAMP
  
20. During the progression from G2 to M phase in fission yeast cell, the mutation in *cdc-25* would lead to:
  - a. Premature Cell Division
  - b. Normal cell Division
  - c. Prolonged Cell growth
  - d. Cell Cycle Arrest

Course : .....

Semester : ..... Roll No : .....

Enrollment No : ..... Course code : .....

Course Title : .....

Session : ..... 2017-18 ..... Date : .....

**Instructions / Guidelines**

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

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Scrutinizer's Signature

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Examiner's Signature

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Invigilator's Signature