## M.Sc. ZOOLOGY THIRD SEMESTER (SPECIAL REPEAT) **GENETICS & EVOLUTION**

MSZ-301

[USE OMR SHEET FOR OBJECTIVE PART]



Full Marks: 70

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**Objective** 

Time: 30 mins.

Duration 2 has

Marks: 20

## Choose the correct answer from the following:

 $1 \times 20 = 20$ 

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1.	Which of the following	ng apes have s	maller brain	s than monkeys	
	a. Orangutan		b.	Gorilla	
	c. Gibbon		d.	Chimpanzee	
2.	The Neanderthals appeared in Europe aboutyears ago.				
	a. 130,000		b.	600,000	
	<b>c.</b> 350,000		d.	90,000	

- 3. Assumptions underlying Hardy-Weinberg equilibrium are: a. Organisms are diploid

b. Mating is random

c. Population size is infinitely large

- d. All of these
- 4. The reproductive isolating factor that occurs when individuals of a species mate at different times is referred to as \_
  - a. Temporal isolation

b. Ecological isolation

c. Gametic isolation

- d. Behavioural isolation
- 5. The appearance of ancestral characteristics in a new born baby such as multiple mammae and tail is very rare. These organs are called:
  - a. Analogous organs

b. Vestigial organs

c. Atavistic organs

- d. Homologous organs
- 6. Who said "Molecular evolution proceeds in a rather regular fashion with respect to time"?
  - a. Allan Wilson

b. Mooto Kimura

c. Zuckerkandl

- d. King and Juke
- 7. The small population that gets separated from the main population is known as a:
  - a. Random population
- b. Splinter population

c. Bottleneck effect

- d. Shift Population
- 8. Speciation refers to evolution of:
  - a. New genus

b. Endangered species

c. New species

d. Rare species

- 9. Stromatolites are:
  - a. Viral mats

b. Fossilized Bacteria

c. Fossilized plants

d. None

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10.	A species inhabiting different geographic  a. Allopatric c. Biospecies	cal area is known as:  b. Sympatric d. Sibling
11.	What changes occur in the chromosome ta. Methylation c. Acetylation	to make it inactive?  b. Glycosylation  d. Phosphorylation
12.	Which of the following controls the cell ca. Cyclin-cdk c. Cell Adhesion Molecule	ycle progression from G2 to M phase?  b. Cyclin d. cAMP
13.	Barr bodies (Seen in saliva test in Olympiassociated with:  a. Male autosome  c. Male sex chromosome	<ul><li>b. Female autosome</li><li>d. Female sex chromosome</li></ul>
14.	During the progression from G2 to M phowould lead to:  a. Premature Cell Division c. Prolonged Cell growth	<ul> <li>b. Normal Cell Division</li> <li>d. Cell Cycle Arrest</li> </ul>
5.	Which region of embryonic gonad is inditestis formation?  a. Cortex  c. Peripheral	uced by Testis Determining Factor (TDF) for  b. Medulla d. Both a and b
6.	Down's Syndrome is due to: a. Crossing over c. Sex linked inheritance	<ul><li>b. Linkage</li><li>d. Nondisjunction of chromosome</li></ul>
7.	Cyclic dependent kinases which control totally activated by:  a. Binding to cyclin, plus phosphorylation by a cdk activating protein kinase  c. Phosphyralation by cdk activating protein kinase	<ul><li>b. Binding to cyclin</li><li>d. Phosphyralation by a tyrosine kinase</li></ul>
	Match the following:  Column -I  A. Down's syndrome  B. Cri-du-chat  C. Klinefelter's syndrome  D. Turner's syndrome  a. A-S, B-T, C-Q, D-R  c. A-S, B-Q, C-R, D-P  The distinct Zig-Zag appearance of the column and core  a. Nucleosome  c. Histone core	Column-II P. An additional sex chromosome Q. Loss of a part of chromosome R. Absence of sex chromosome S. Presence of an extra chromosome T. Presence of two extra chromosome b. A-T, B-S, C-P, D-Q d. A-S, B-Q, C-P, D-R hromatin is due to b. Histone H <sub>1</sub> d. Linker DNA
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- 20. In an experiment you add the short arm of Y chromosome to a Cell line with composition AA+XX. What will you see?

  a. The cell rejects the Y Chromosome

  - c. The cell develops male character
- b. The cell develops female character
- d. The cell develop neuter gender character

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## (<u>Descriptive</u>)

T	Time: 2 hr. 30 mins.	
	[Answer question no.1 & any four (4) from the rest]	
1	. What is somatic cell genetics and explain its use on the chromosome mapping in a given somatic cell.	3+7=10
2	What are Cell Cycle Checkpoints? Explain how APC/C helps in regulation and separation of sister chromatids to progress cell into Anaphase.	3+7=10
3.	<ul> <li>a) Write about the Prokaryotic and Eukaryotic evolution.</li> <li>b) Discuss the development of multicellular organisms from early prokaryotes.</li> </ul>	5+5=10
4.	What are CpG Islands? What are the important roles played by CpG Islands in the human genome?	4+6=10
5.	How did Cro-Magnons differ from Neanderthals? Is there any evidence that they coexisted with Neanderthals? If so, where and when?	2+6+2=10
6.	Define Endosymbiotic theory. Describe about the brief history of Origin of life. How Miller & Urey explains about the conditions of primitive Earth.	2+5+3=10
7.	What is meant by Dosage Compensation? Explain the mechanism of inactivation of 'X' chromosome in human female.	2+8=10
8.	A population of rabbits may be brown (the dominant phenotype) or white (the recessive phenotype). Brown rabbits have the genotype BB or Bb. White rabbits have the genotype bb. The frequency of the BB genotype is 0.35. What is the frequency of heterozygous rabbits, the 'B' allele and the 'b' allele?	10

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