2024

(CBCS)

(6th Semester)

ZOOLOGY

NINTH PAPER

(Molecular Biology and Genetics)

Full Marks: 75

Time: 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A-OBJECTIVE)

(Marks: 10)

Γick	(/) the correct answer in the brackets	provided:	1×10=10
	Polyteny of giant chromosome is ach (a) mitosis () (c) endomitosis ())
2.	The 5' end of tRNA always has a ba (a) guanine () (c) thymine ()	se (b) cytosine () (d) adenosine ()	
3.	In DNA replication, the strand which is (a) lagging strand () (c) leading strand ()	s synthesized continuously is cal (b) Okazaki fragment ((d) template strand (lled))
4.	Pyrimidine bases fused by UV light (a) DNA ligase () (c) Photolyase ()	are separated by which enzyme (b) DNA polymerase ((d) Glycosylase ()) 5
5.	In lac operon, conversion of lactose in (a) β-galactosidase () (b) galactoside permease () (c) transacetylase () (d) operator gene ()	to glucose and galactose is done	by

6. Wh (a) (c)	UAA	the follow () ()	ring is not		AG	() (),		
(a)	ninant epis 9:3:3:1 9:3:4	stasis has () ()	a ratio of	(b) 9: (d) 12	-	()		
(a) (b) ; (c) ;	kappa par	ticles in F eritance i g in snail	mic inherita Paramecium n Mirabilis ()	' ()			
(a) I (b) H (c) T	h one of itance? Down synd Iaemophili Urner syn Ilinefelter s	rome a (drome	owing general () () () ()	ric disor	ders is	due t	o sex-l	inked
10. The k	ind of mut	ation whe	re purine ba	se is sub	ostituted	by pyri	midine	base
(a) tr	led ansition anslocation	()			sversion	()	
		(SECT	ION : B—SH	ORT ANS	WERS)			
			(Marks	: 15)	•			
Write notes	on the foll	owing in 5	to 8 senten	ces each	:			3×5=15
			Unit-	– I				
1. Function	ons of histo	one protei	ns					
2. Polyten	e chromos	ome						
/540			ė					

/549

Unit—II

3. RNA polymerase enzyme

OR

4. Semi-conservative DNA replication

Unit—III

5. Central dogma of molecular biology

OR

6. Termination of prokaryotic translation

UNIT-IV

7. Incomplete dominance

OR

8. Alleles

UNIT-V

9. Complete linkage

OR

10. Missense mutation

(SECTION : C-DESCRIPTIVE)

(Marks: 50)

Answer the following questions:

10×5=50

UNIT-I

Discuss, in detail, the higher order of chromosome organization in the cell.
 OR

2. Describe the double helical structure of DNA and the different forms of DNA.

Contd.

UNIT-II

3. Describe the mechanism of DNA replication in prokaryotic cells.

10

OR

4. Explain the mechanisms of mismatch repair and nucleotide excision repair.

10

UNIT-III

5. Write notes on the following:

5+5=10

- (a) Structure and role of tRNA in translation
- (b) The elongation process of translation

OR

 Explain the term 'gene expression'. Also describe the rho dependent and rho independent forms of transcription termination in prokaryotes. 4+6=10

UNIT-IV

7. Give a detailed account of Mendel's laws of inheritance giving suitable examples.

8. Write notes on the following:

5+5=10

10

- (a) Multiple alleles
- (b) Chromosome theory of inheritance

OR

UNIT-V

9. Write a note on the mechanism of non-disjunction of chromosomes. Explain the effect of non-disjunction with suitable example taking human genetic disease as an example.
4+6=10

OR

10. Write notes on the following:

5+5=10

- (a) Crossing-over and recombination of genes
- (b) Numerical changes in chromosomes

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(SECTION : A-OBJECTIVE)

(Marks: 10)

					•							
Tick	(/)	the correct ar	nswer in	the	brack	ets prov	rided:				1×10	=10
1.	Poli (a) (c)	yteny of gian mitosis endomitosis	()	10SO)	me is	(b) (d)	repeated salivary (()	
	(a) (c)	e 5' end of tR guanine thymine	()			(b) (d)	cytosine adenosin)			
3.		ONA replication lagging strand leading stran	nd	trar ((nd whice))	ch is syr (b) (d)	ithesized o Okazaki template	iragmen	usly t	is c	alled))	
4.	Pyr (a) (c)	imidine bases DNA ligase Photolyase	fused (by))	UV lig	ht are s (b) (d)		merase	h er	ızyn ()	ne?)	
5.		ac operon, con β-galactosida galactoside p transacetylas operator gen	ise permeas se	(lactose) ())	into glu	icose and	galactos	e is	done	by	

	b. which one of the follows	ng is not a sto	ob codon 5		
	(a) UAA ()	(b)) UAG	()	
	(c) UGA ()	(d,) AUG	()	
	7. Dominant epistasis has	a ratio of .			
	(a) 9:3:3:1 ()	(b)	9:7	()	
	(a) 9:3:3:1 () (c) 9:3:4 ()	(d)	9:7 12:3:1	()	
	8. The example of cytoplasm	nic inheritance	is		
	(a) kappa particles in Pe	aramecium	()		
	(b) plastid inheritance in	Mirabilis	()		
	(c) shell coiling in snail(d) rRNA in eukaryotes				
	(a) Have in editaryotes	ř)			
9	9. Which one of the follo inheritance?		disorders is	s due to	sex-linked
	(a) Down syndrome (b) Haemophilia ((c) Turner syndrome (d) Klinefelter syndrome	()			
	(c) Turner syndrome))			
	(d) Klinefelter syndrome	` (')			
10	The kind of mutation when is called	re purine base is	s substitute	d by pyri	midine base
	(a) transition ()	(b)	transversio	n (1
	(c) translocation () (d)	inversion	()	, ,
			*	` '	
	(SECT	ION : B—SHORT	ANSWERS)	
		(Marks : 15)		
Wr	ite notes on the following in 5	to 8 sentences	each :		3×5=15
		Unit—I			
1.	. Functions of histone prote	ins	14		
	OR	1000			
2.	Polytene chromosome				

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UNIT—II

3. RNA polymerase enzyme

OR

4. Semi-conservative DNA replication

UNIT-III

5. Central dogma of molecular biology

OF

6. Termination of prokaryotic translation

UNIT-IV

7. Incomplete dominance

OR

8. Alleles

UNIT-V

9. Complete linkage

OR

Missense mutation

(SECTION : C-DESCRIPTIVE)

(Marks : 50)

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