

U.G. 5th Semester class test-2025
Raghunathpur College
Department of Zoology
Course Code: BZOCCCHC501
Course title: Molecular Biology

Full Marks: 30

Time: 2 Hours

1. Answer any ten questions from the following:

1 × 10 = 10

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|---|--|
| <ul style="list-style-type: none"> a) In PCR, what temperature is typically used for the annealing step? b) What is RISC? c) How many promoters control the transcription of <i>E. coli</i> lac operon? d) What is catabolite repression? e) What are Riboswitches? f) Write the role of Anticodon loop at t-RNA. g) What is 'Pribnow box'? h) Mention the significance of Poly-A tail. | <ul style="list-style-type: none"> i) What are the components of prokaryotic RNA polymerase? j) Write the full form of DAM. k) What is Photoreactivation? l) Write down the Chargaff's rules m) Write down the role of sigma factor. n) State the function of DNA Gyrase. o) State the function of anticodon loop in t-RNA. |
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2. Answer any five questions from the following:

2 × 5 = 10

- a) Difference between inducible and repressible operon
- b) What is glucose effect?
- c) Mention the names of different sites of a ribosome?
- d) Write a note on stop codon.
- e) What is alternative splicing and exon shuffling?
- f) What are the roles of Mut-S, Mut-H and Mut-L in DNA repair mechanism?
- g) What are the roles of DNA pol I and ligase in DNA repair mechanism?
- h) What is the role of photolyase in DNA repair?

3. Answer any two questions from the following:

5 × 2 = 10

- a) Using + for production and – for non-production of enzymes, complete the following table: 5

Genotype	Lactose			No Lactose		
	LacZ	LacY	LacA	LacZ	LacY	LacA
I⁺P⁺ O⁺Z⁻ -Y⁻A⁺/ I⁻ P⁺ O⁺ Z⁻ Y⁺ A⁺						
I^f P⁺ O⁺ Z⁺ Y⁻ A⁻/I⁺ P⁺ O⁺ Z⁺ Y⁺ A⁺						
I⁺ P⁺ O^c Z⁺ Y⁺ A⁺/I⁺ P⁺O⁺Z⁺ Y⁻ A⁺						
I^d P⁻ O⁺ Z⁺ Y⁺ A⁺						
I^f P⁺ O⁺ Z⁻Y⁺ A⁺						

- b) Briefly describe the elongation process of translation in prokaryote with proper diagrams.
- c) What do you mean by NER? Describe the mechanism of NER in *E.coli*.

U.G. 5th Semester class test-2025
Raghunathpur College
Department of Zoology
Course Code: BZOCCCHC502
Course title: Genetics

Full Marks: 30

Time: 2 Hours

1. Answer any ten questions from the following: 1 × 10 = 10

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|---|---|
| <ul style="list-style-type: none"> a) What do you mean by maternal effect? b) What is linkage group? c) What is kappa particle? d) What is Hfr? e) What is transposase? f) Write the role of SOX9 gene. g) What are epistatic and hypostatic gene? h) What do you mean by cis-trans test? | <ul style="list-style-type: none"> i) What is penetrance? j) Define Pleiotropy. k) Give example of multiple allelism. l) What is Holiday junction? m) Give example of epistatis. n) What do you mean by lethal alleles? o) What are retrotransposons |
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2. Answer any five questions from the following: 2 × 5 = 10

- a) State the correlation that exists between coincidence and interference.
- b) What are LINEs and SINEs?
- c) What are auxotroph and prototroph?
- d) Distinguish between sex limited and sex influenced inheritance.
- e) What is genic balance theory?
- f) What is codominance? Give example.
- g) g)What is polygenic inheritance? Give example.
- h) write the role of SOX gene?

3. Answer any two questions from the following: 5 × 2 = 10

- a) Calculate the gene map distance, coefficient of coincidence and interference of the following data: 5

F_2				Genotype of maternally inherited X chromosome	Number observed
Class	Phenotype				
1	Scute, echinus, crossveinless	sc	ec	cv	1158
2	Wild-type	sc ⁺	ec ⁺	cv ⁺	1455
3	Scute	sc	ec ⁺	cv ⁺	163
4	Echinus, crossveinless	sc ⁺	ec	cv	130
5	Scute, echinus	sc	ec	cv ⁺	192
6	Crossveinless	sc ⁺	ec ⁺	cv	148
7	Scute, crossveinless	sc	ec ⁺	cv	1
8	Echinus	sc ⁺	ec	cv ⁺	1
Total:					3248

- b) What is crisscross inheritance? Describe crisscross type of inheritance in human. 1+4
- c) Write down mechanism of sex determination in Human. 5

U.G. 5th Semester class test-2025
Raghunathpur College
Department of Zoology
Course Code: BZOODSHC2 [DSE2]
Course title: Fish and fisheries

Full Marks: 30

Time: 2 Hours

1. Answer any ten questions from the following:

1 × 10 = 10

- | | |
|---|---|
| a) Write scientific name of any ornamental fish | h) What is hapa? |
| b) Give example of two transgenic fish. | i) Write scientific name of two exotic carp. |
| c) What is brood stock management? | j) What is Isinglass? |
| d) Name any two law fish law. | k) What is gill raker? |
| e) What is fish glue? | l) Mention two features of placoid scale |
| f) What are the different types of cages used in cage culture? | m) What is the difference between gills and gill slits? |
| g) Name two synthetic hormones used in induced breeding in carps. | n) What is physoclistous swim bladder? |
| | o) What are Weberian ossicles? |

2. Answer any five questions from the following:

2 × 5 = 10

- a) What are canning and smoking?
- b) Differentiate between shell fish and fin fish.
- c) Write two advantages and two disadvantages of induced breeding.
- d) Write two advantages and two disadvantages of polyculture.
- e) What is the function of the caudal and anal fins in fish?
- f) What is a diphyrcercal tail, and mention its function.
- g) Give two example of fish which shows bioluminescence.
- h) Differentiate between holobranch and hemibranch.

3. Answer any two questions from the following:

5 × 2 = 10

- a) Write down the steps in transgenic fish production. Write down the causative agent of black spot disease and itch/ich in fish. 4 +1
- b) Briefly describe different types of accessory respiratory organs in fishes. 5
- c) Write short note on Fish by products.5

U.G. 5th Semester class test-2025
Raghunathpur College
Department of Zoology
Course Code: BZOODSHC1 [DSE1]
Course title: Animal Biotechnology

Full Marks: 30

Time: 2 Hours

1. Answer any ten questions from the following:

1 × 10 = 10

- a) What is expression vector?
- b) Who proposed the dideoxy method of DNA sequencing?
- c) From which organism Taq polymerase is isolated?
- d) What is passage number?
- e) Write the full form of BAC and MAC.
- f) What is gene knockout?
- g) What is chimera?
- h) Write the name of the first cloned animal.
- i) What is the difference between clone and genetically modified organisms?
- j) What do you mean by GMOs?
- k) What is probe?
- l) Name one Restriction enzyme and its restriction site
- m) What is sticky end?
- n) What is DNA microarray
- o) Mention the importance of Primer in PCR

2. Answer any five questions from the following:

2 × 5 = 10

- a) Cite one example each of anchorage dependent and anchorage independent cell line.
- b) What are the essential features of an ideal cloning vector?
- c) Name two blocking agent used in Western blot.
- d) What is electroporation?
- e) Write the characteristics of plasmid vectors.
- f) Mention two usages of cloning.
- g) Differentiate between multipotency and totipotency.
- h) What is gene knockdown?

3. Answer any two questions from the following:

5 × 2 = 10

- a) Briefly describe the procedure for construction of genomic libraries with proper diagram.5
- b) Briefly describe the application of transgenic animals. What is nuclear transplantation? 4+1
- c) Describe the process of cloning in sheep. Name two therapeutic protein that can be produced from the domestic animals. 4+1