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B.Sc./5th Sem (H)/ZOOH/22(CBCS)

2022

5th Semester Examination
ZOOLOGY (Honours)

Paper : C 11-T

[Molecular Biology]

[CBCS]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

1. Answer any *five* of the following questions : $5 \times 2 = 10$

- (a) What do you mean by TATA Box and CAAT Box ?
- (b) Write the significance of histone methylation.
- (c) What do you mean by Degeneracy of genetic code ?
- (d) Why DNA is considered nucleic acid ?
- (e) Differentiate between Activators and Enhancers.
- (f) What is salting out of DNA ?

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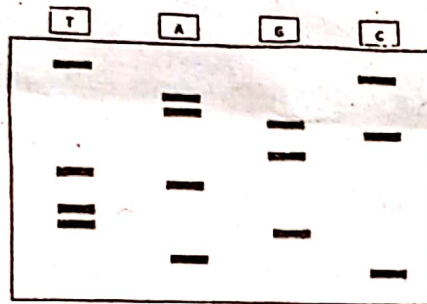
(g) What is hypochromic shift in DNA ?

(h) What are the basal transcription factors ?

Group - B

2. Answer any *four* of the following questions : $4 \times 5 = 20$

(a) Why is sanger sequencing called didoxy sequencing ? Based on the given gel picture below write down the DNA sequence.



What is BigDye ?

$2+2+1$

(b) Give a schematic representation of spliceosome mediated splicing. What is RNA editing ? $4+1$

(c) Write short notes on :

(i) Base excision repair.

(ii) DNA proofreading

$2\frac{1}{2}+2\frac{1}{2}$

(d) What is catabolic repression ? What are constitutive mutations of lac operon ? $3+2$

(3)

- (e) Why is DNA replication called semi-discontinuous? Briefly describe the 'Rho independent' termination of transcription. 3+2
- (f) Describe the process of intron removal by spliceosome. What is Shine-Dalgarno sequence? 4+1

Group - C

3. Answer any *one* of the following questions : 1×10=10

- (a) Give a clear diagram of OriC. Write down the significance of sliding clamp in DNA replication. Describe lagging strand DNA replication with a suitable diagram. Why is DNA replication considered semiconservative? 2+2+4+2
- (b) Differentiate between prokaryotic and eukaryotic transcription. What is RNA editing? Mention any two applications of Southern Blotting Technique. Illustrate the process of RNA charging during translation in prokaryotes. 2+3+2+3

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5th Semester Examination
ZOOLOGY (Honours)

Paper : C 12-T

[Genetics]

[CBCS]

Full Marks : 40

Time : Two Hours

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Group - A

1. Answer any *five* of the following questions : $5 \times 2 = 10$

✓(a) What is replicative transposon ? Give an example. $1+1$

(b) Differentiate auxotrophs from prototrophs.

✓(c) Give example of one monosomic and one trisomic condition in human.

✓(d) What is frame shift mutation ?

(e) What is Dosages compensation ?

✓(f) What is transposons ?

P.T.O.

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- (g) What is incomplete dominance examples ?
- (h) What is pleiotropy ?

Group - B

2. Answer any *four* of the following questions : $4 \times 5 = 20$

- (a) Describe the basic features of an ISI element.
Comment on its mechanism of transposition. 3+2
- (b) Briefly discuss the molecular mechanism of dosage compensation in human/mammal.
- (c) The result of a test cross experiment shows 15 progenies with new combination and 108 progenies with parental combination. Calculate recombination frequency. What do you understand by 'coupling' and 'repulsion' ? 2+3
- (d) How does missense mutation differ from neutral mutation ? What is tautomeric shift ? Cite one example of base analog mutagen. 3+1+1
- (e) How does nondisjunction affect chromosome number ?
- (f) How is sex determined in Drosophila ? What is sex of XXY Drosophila ?

~~mirabie & Jalp~~

(3)

Group - C

3. Answer any *one* of the following questions.: $1 \times 10 = 10$

(a) What is complementation test ? Discuss the Benzer's experiment with rII region of T4 bacteriophage for determining whether two rII mutants belong to same gene or not. $2+8$

(b) What is a chromosomal aberration ? What are the types of chromosomal aberrations ? Write a note on different chromosomal trisomy and their symptoms. $2+3+5$

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B.Sc/5th Sem (H)/ZOOH/22(CBCS)

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5th Semester Examination

ZOOLOGY (Honours)

Paper : DSE 1-T

[CBCS]

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Time : Two Hours

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[Animal Behavior and Chronobiology]

Group - A

1. Answer any *five* of the following questions : $5 \times 2 = 10$

- (a) What is telotaxy ?
- (b) What is fixed action pattern ?
- (c) Distinguish between innate and learned behavior.
- (d) Write notes on advantages of the Waggle dance.
- (e) Distinguish between endogenous rhythm and exogenous rhythm.
- (f) What are circannual rhythms ?

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Or

[Reproductive Biology]

Group - A

1. Answer any *five* of the following questions : $5 \times 2 = 10$

- (a) Define orphan receptor with example
- (b) What do you mean by follicular atresia ? *Phagocytosis of Gran*
- ✓(c) What is the function of prostate gland ?
- (d) What is Nebenkern ?
- ✓(e) State the function of relaxin.
- (f) What is superovulation ?
- (g) Mention the metabolic end-products of androgen.
- ✓(h) State the function of Sertoli cells.

Group - B

2. Answer any *four* of the following questions : $4 \times 5 = 20$

- ✓(a) Write a short note on "Two cell two gonadotropin" hypothesis. Briefly describe the changes at molecular level that occur during capacitation process. $3+2$
- (b) With suitable diagram describe the spermiogenesis process. Define reflex ovulation with example. $3+2$

zygot in the fallopian tube

(7)

✓(c) Describe the mechanism of milk secretion. What is lactational amenorrhea ? 3+2

(d) With suitable diagram describe the Δ^4 pathway of testosterone biosynthesis. State the function of follistatin. 3+2

✓(e) Briefly describe the hormonal regulation of menstrual cycle. 5

(f) Write a short note on ZIFT and IUI. Write the functional mechanism of Copper-T loop. 3+2

Group - C

2. Answer any *one* of the following questions : 1×10=10

(a) Briefly state the immunological and endocrine function of placenta. Describe the process of implantation. 4+6

(b) Describe the endocrine regulation of parturition. Write a short note on mechanistic aspect of different oral contraceptives. What is gestational diabetes ? 4+4+2

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[CBCS]

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[Animal Biotechnology]

Group - A

1. Answer any *five* of the following questions : $5 \times 2 = 10$

(a) What is shotgyn cloning ?

(b) What is split gene ?

(c) What do you mean by comparative genomics ?

(d) Give two example of animal cell line that you know.

(e) Compare between c-DNA and r-DNA.

(f) Mention four characteristics of an ideal vector.

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(g) Write down two application of DNA fingerprinting.

(h) What is gene therapy ?

Group - B

2. Answer any *four* of the following questions : $4 \times 5 = 20$

✓ (a) Distinguish between cloning vector and experssion vector. 5

(b) What is transformation ? Briefly describe the methods of transformation during RDT. 1+4

~~(c)~~ Write a short note on Southern blotting. 5

✓ (d) What are restriction endonucleases (RE's) ? Comment on different types of RE's. 1+4

✓ (e) What is VNTR ? Write down the principle of DNA fingerprinting. 1+4

✓ (f) Enumerate the steps involved in knock out mice production. 5

Group - C

3. Answer any *one* of the following questions : $1 \times 10 = 10$

(a) What are the advantages of PCR over DNA cloning ? Mention the steps involved in PCR. Describe the principle of Sanger method of DNA sequencing. 2+4+4

(3)

(b) State the molecular causes and diagnosis of the following diseases.

(i) Sickle Cell Anaemia

(ii) Cystic Fibrosis

5+5