Duration 3 Hours **Marks :- 100**

Please check whether you have got the right question paper.

N.B.:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat and labeled diagrams wherever necessary.

Q.1 A Fill in the blanks by choosing the correct option given in the brackets: **05**

i. ……. is the smallest unit of genetic material which when changed or mutated produces a change in the phenotype.
(Recon, cistron, muton)

ii. The name, 'polytene' chromosome was given by ……..
(Lillie, Fleming, Kollar)

iii. Holandric genes are present in …….. .
(only females, only males, males and females)

iv. An mRNA molecule that is bound to clusters of ribosomes constitutes a …….. .
(Polymerase, polysome, microsome)

v. Capping of RNA is carried out by addition of a methylated guanosine base to the ……. of the RNA (5' end, 3' end , middle)

B Match column I with column II and rewrite : **05**

	Column I		Column II
i.	Normal colour vision	a.	12:3:1 Phenotype ratio
ii.	Dominant epistasis	b.	Lampbrush chromosomes
iii.	Sex influenced genes	c.	Histone octamer
iv.	Axial fibres	d.	Dominant trait
v.	Nucleosome	e.	Pattern of baldness in humans

C. Mention whether the following statements are 'True' or 'False' : **05**

i. A recessive trait is a phenotype that is not expressed in a heterozygous genotypes.

ii. In metacentric chromosome the centromere is located almost near to any one of its end.

iii. Disorders such as hemophilia and colour blindness are controlled by Y-linked genes.
iv. In the lac operon of *E.coli*, lactose functions as an inducer.
v. Heterochromatin is transcriptionally inactive.

D. Answer in one or two sentences only : **10**

i. Define phenotype.
ii. Define allele.
iii. What is an ideogram?
iv. How is the termination of transcription different in prokaryotes and eukaryotes?
v. Define a Gynandromorph.

Q.2 A Answer <u>any one</u> of the following : **10**

i. Give an account on "Modern concept of gene". Explain polygenic inheritance in man.
ii. With appropriate illustrations explain dihybrid cross. Add a note on law of independent assortment.

B. Answer <u>any two</u> of the following: **10**

i. Differentiate between incomplete dominance and co-dominance.
ii. Discuss with appropriate chart, pedigree analysis of autosomal recessive inheritance.
iii. Explain ABO blood groups in man.
iv. Write a brief note on factors affecting crossing over.

Q.3 A. Answer <u>any one</u> of the following: **10**

i. Explain the structure of eukaryotic chromosome.
ii. Explain sex determination in *Drosophila.*

B. Answer <u>any two</u> of the following: **10**

i. Briefly describe haplodiploidy.
ii. Explain briefly parthenogenesis.
iii. Describe sex determination in crocodile.
iv. Describe the phenomenon of 'Freemartin'.

Q.4 A. Answer <u>any one</u> of the following: **10**

i. With the help of labeled diagram, describe the structure of t-RNA. Add a note on its function.

ii. What is genetic code? Explain in detail the properties of genetic code.

B. Answer <u>any two</u> of the following: **10**

i. Explain the role of various enzymes involved in eukaryotic DNA replication.

ii. Describe the A and B forms of DNA.

iii. Give an account of DNA present in prokaryotes.

iv. Describe the process of elongation in polypeptide synthesis.

Q.5 Write short note on <u>any four</u> of the following : **20**

i. Lethal alleles,

ii. Monohybrid cross,

iii. X-chromosome in humans,

iv. Barr body,

v. Concept of operon,

vi. Role of RNA polymerases in eukaryotic transcription.

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