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M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2015.

Third Semester

Zoology

GENETICS

(For those who joined in July 2012 onwards)

Time : 3 hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. The phenomenon of preventing the expression of one gene by the action of another gene is known as
 - (a) epistasis
 - (b) codominance
 - (c) complete dominance
 - (d) incomplete dominance

2. When a single character is controlled by two or more pairs of non allelic genes independently, the genes are called

- (a) complementary genes
- (b) supplementary genes
- (c) duplicate genes
- (d) lethal genes

3. A gene coding a single polypeptide chain is called

- (a) cistron
- (b) muton
- (c) recon
- (d) none of the above

4. A set of genes responsible for the metabolism of lactose in Escherichia coli is called

- (a) operon
- (b) lac operon
- (c) ara operon
- (d) all the above

5. The transfer of genetic materials through plasmids from one bacterium to another is called

- (a) transformation
- (b) conjugation
- (c) sexduction
- (d) transduction



6. The inheritance of the metabolic disorder phenylketomuria follows the Mendel's.

- (a) law of dominance
- (b) law of segregation
- (c) law of independent assortment
- (d) law of unit characters

7. In Hardy – Weinberg equation, the term $2pq$ represents the frequency of the

- (a) dominant homozygotes
- (b) recessive homozygotes
- (c) heterozygotes
- (d) none of the above

8. If an autosomal recessive disorder which shows Hardy – Weinberg equation has an incidence of 1 in 6400 then the frequency of carriers is approximately

- (a) 1 in 20
- (b) 1 in 40
- (c) 1 in 80
- (d) 1 in 160

9. The size, shape and morphology of all the chromosomes of an organism constitute

- (a) Genome
- (b) Karyotype
- (c) DNA database
- (d) Structure database

10. Which of the following syndromes are produced by non-disjunction in man

- (a) kline felter's syndrome
- (b) turner's syndrome
- (c) down's syndrome
- (d) all the above

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain idiogram with an example.

Or

(b) Illustrate the inheritance of combs in fowls.

12. (a) Describe the structure of a gene.

Or

(b) Discuss the concept of operon.

13. (a) What are oncogenes? Explain how they are produced from proto-oncogene.

Or

(b) Examine the nature of transposable elements in prokaryotes.



14. (a) Explain what is Mendelian population.

Or

- (b) State the significance of Hardy-Weinberg law.

15. (a) Mention the use of amniocentesis in the diagnosis of sex chromosome abnormalities.

Or

- (b) What are autosomal abnormalities? Explain with an example.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss Mendel's law of independent assortment.

Or

- (b) What are giant chromosomes? Explain their types.

17. (a) Explain the characteristics of genetic code.

Or

- (b) Comment on the types of DNA replication.

18. (a) Write an essay on the technique of mapping of bacterial genes by interrupted mating.

Or

- (b) Give an account on inborn errors of metabolism.

19. (a) Explain how the gene frequencies of sex linked genes are calculated.

Or

- (b) Discuss the factors influencing deviations in Hardy-Weinberg law.

20. (a) Illustrate pedigree analysis with an example.

Or

- (b) Explain the normal karyotype banding patterns of human chromosomes.
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