REV-00
BBT/29 /34 2014/03

B. Sc. BIOTECHNOLOGY
Third Semester
Genetics
(BBT - 11)

Duration: 3Hrs. **Full Marks: 70**

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins. **Marks: 50**

1) Distinguish between following (any *five*)**:** **2 × 5 =10**

a) Complementary and supplementary genes
b) Dominance and epistatis
c) Null hypothesis and alternative hypothesis
d) Maternal and unipaerntal effect
e) Auxotrophs and protrophs
f) Coupling and repulsion
g) Polygenic inheritance and multiple allelism

2) Answer the following questions (any *five*)**:** **3 ×5 =15**

a) "Mutations can occur at any stage during the development of the organism" Justify the statement
b) Define the terms: a) lethal mutation b0resistant mutation c) conditional mutation
c) A woman has normal parents and a colour blind brother. What is the probability that her first son will be colour blind?
d) A girl of normal vision whose father was colour blind marries a man of normal vision whose father was also colour blind. What type of vision can be expected in their offspring?
e) If a cross is made between two parents with genotype TTQQRR x ttqqrr show how many gametic combinations are possible?
f) Describe Mendel's second law?
g) Describe polygenic inheritance with suitable example?

3) Answer the following questions (any *five*): **5 × 5 =25**

a) Describe cytoplasmic inheritance in ciliate protozoans?
b) Describe maternal effects using the example of shell coiling in snails?
c) Describe the mechanism of dominance
d) State Hardy-Weinberg principle? Under which conditions Hardy-Weinberg principle is not applicable. Describe in brief.
e) Describe sex-linked in details with examples.
f) What are structural changes in chromosomes? Describe each class in details.
g) Describe Stern's experiment for cytological detection of crossing over?

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(The figures in the margin indicate full marks for the questions)

Duration: 20 minutes **Marks – 20**

PART A- Objective Type

I) Fill in the blanks with the correct answer: **1 × 20 =20**

Cytogenetics deals with various aspects of ……..

a) Cells b) Chromosomes c) Genes d) Genome

2) Bateson gave the concept of ……..

a) genotype b) gene c) phenotype d) karyotype

3)…….. first demonstrated that 3UUU in mRNA codes for phenylalnine

a) Nirenberg b) Khorana c) Watson d) Crick

4)…… is the unit of gene function for production of polypeptide.

a) Cistron b) Recon c) Muton d) Codon

5)…… genetics begins at the level of the phenotype and progresses to the DNA segment responsible for it.

a) Forward b) Reverse c) Plant d) Animal

6) Genes capable of changing their position are called……. genes.

a) Transition b) Jumping c) Walking d) None of the above

7) The book "Inborn errors of metabolism" was published by

a) Punnet b) Garrod c) Ruther d) None of the above.

8) Characters expressed in F1 individuals are

a) Recessive b) Dominant c) Hybrid d) None of the above

9) A gene which causes death of an individual carrying it is called .....

a) Sublethal b) Vital c) Supervital d) Lethal

10) Genes were termed as ..... by Mendel.

a) Alleles b) Factor c) Allelomorph d) None of the above.

11) Colour vision in humans is .....

a) Monochromatic b) Dichromatic c) Trichromatic d) Tetrachromatic

12) Germplasm theory was coined by .....

a) Swammerdam b) Weissmann c) Bonnet d) None of the above

13) Inheritance of skin is a ..... trait.

a) Polygenic b) Multiple c) Epistatic d) None of the above.

14) The term gene was coined by .....

a) Johanssen b) Bateson c) Punnet d) None of the above.

15) Sex-linked genes show ..... inheritance.

a) X-linked b) Y-linked c) Sex linked d) Criss cross

16) Genes located exclusively on Y chromosomes are ..... genes.

a) Y-linked b) XY-linked c) Holandric d) Hemizygous

17)..... traits depend on whether a person is male or female.

a) Sex-linked b) Sex-influenced c) Sex-biased d) Both a and c

18) ..... mutants cannot grow on minimal medium.

a) Prototrophs b) Autotrophs c) Phototrophs d) Auxotrophs

19) Shell coiling in snails is an example of ..... inheritance.

a) Sex-linked b) Extra chromosomal c) Plastid d) Uniparental

20) Loss of a part of a chromosome results in .....

a) Duplication b) Inversion c) Deficiency d) Translocation.

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