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SEMESTER END THEORY EXAMINATION

B.Sc. (Hons.) Horticulture

Semester	:	**I(New)**	**Term**	:	I	**Academic Year**	: 2020-21
Course No.	:	**H/Bot-112**	**Title**	:	**Principles of Genetics and Cytogenetics**		
Credits	:	3 (2+1)					
Day & Date	:	**14/07/2021, Wednesday**	**Time**	:	12.00-2.00	**Total Marks**	: 80

Note : 1) Solve ANY EIGHT questions from SECTION-A
2) Solve ANY TWELVE questions from SECTION-B
3) ALL questions from SECTION-C are compulsory
4) Send the PDF file of answer sheet to the email id of respective course teacher

SECTION-A

(Write the answers in 4-5 sentences only. Each question carries 4 marks)

Q. 1 Define linkage. Explain different types of linkages.
Q. 2 Write a note on m-RNA.
Q. 3 Define cell. Enlist five major cell organelles with important functions.
Q. 4 Explain the different types of chromosomes on the basis of position of centromere.
Q. 5 Differentiate between the process of mitosis and meiosis.
Q. 6 Describe the double helical structure of eukaryotic DNA.
Q. 7 What is incomplete dominance? explain with an example.
Q. 8 Differentiate between DNA and RNA.
Q. 9 Explain the chromosomal theory of inheritance.
Q. 10 Give the characteristics of genetic code.

SECTION-B

(Write the answers in one sentence only. Each question carries 2 marks)

(Answer in one sentence/Do as directed/Define etc.)

Q. 11 Define the following terms
a) Genotype
b)Emasculation
c)Codon
d)Genetics
e)Test Cross
f) Which of the Mendel's laws of inheritance is universally applicable?
g) Blood group is an example of.
h)Central dogma of protein synthesis involves the process of.
i) Who proposed the classical model of Lac operon.
j)One gene one enzyme hypothesis was given by.
k)Give the contribution of Seymour Benzer in genetics.
l) The concept of jumping genes was given by.
m)What is synapsis?
n) Which RNA polymerase is required for the synthesis of m-RNA.

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SECTION-C
(Choose the correct option. Each question carry 1 mark)

Q. 12 1)Which of the following forms the long polymer of DNA ?

a) Ribonucleotids b) Amino acids
c) Monosaccharides d) Deoxyribonucleotides

2)A single gene controlling the multiple phenotypic expression is known as

a) Sex linked gene b) Co-dominant gene
c) Autosomal recessive gene d) Pleiotropic gene

3) How many types of gametes would be produced in an individual with genotype AaBbCc?

a) 8 b) 2
c) 6 d) 4

4) UV radiation is an example of ------ mutagen.

a) Chemical b) Biochemical
c) Physical d) Biological

5)The final proof for DNA as the genetic material came from the experiments of

a) Avery, Mcleod and McCarty b) Griffith
c) Hargobind Khorana d) Hershey and Chase

6)The codon AUG has dual function. It is initiation codon and also code for

a) Serine b) Methionine
c) Formaldehyde d) Phenylalanine

7)A group of genes or a segment of DNA that functions as single transcription unit is

a) Inducer b) Promoter
c) Operon d) Gene bank

8)Which of the following enzyme is used for generation of DNA fragments of various length?

a) Restriction endonuclease b) DNA ligase
c) Rnase d) DNA polymerase

9) The genotypic ratio of Mendel's monohybrid cross is

a) 2 : 2 b) 1 : 2 : 1
c) 3 : 1 d) 1 : 1 : 1 : 1

10)In double stranded DNA adenine are 120 and guanine are 60 what would be the total number of nitrogen bases?

a) 180 b) 280
c) 360 d) 720

11)If the centromere is situated at the tip of the chromosome it is called

a) Metacentric b) Acrocentric
c) Submetacentric d) Telocentric

12)The sister chromatids are held together by

a) Centrioles b) Centromere
c) Chromomere d) Chromonemata

13) In a dihybrid cross, the F2 generation off-springs shows four different phenotypes while the genotypes are

a) Six b) Nine
c) Four d) Sixteen

14) Which of the following is a stop codon?

a) AUG b) GUG
c) GGU d) UAA

15) Which of the following is the smallest RNA?

a) t-RNA b) m-RNA
c) hn-RNA d) r-RNA

Contd..

16) Which of the following is responsible for expression of a trait?

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

17)Which of the following is a pyrimidine base?

a) Uracil b) Adenine
c) Guanine d) Roboflavin

18) A monohybrid cross in which both the alleles of a pair express themselves fully in F1 generation. This phenomenon is known as.

a) Incomplete dominance b) Codominance
c) Semi-dominance d) epistasis

19) Skin colour in man is an example of

a) Sex-linked inheritance b) Pleiotropy
c) Multiple allelism d) Polygenic inheritance

20) Who among the following scientists rediscovered the Mendel's work?

a) T. H. Morgan b) W. Bateson
c) Von Tschermak d) E. Strasbruger

21) Which one of the following carries extra nuclear genetic material?

a) Golgi apparatus b) Ribosomes
c) Centrioles d) Plastids/Mitochondria

22) The enzyme used to join the fragments of DNA during the process of replication is.

a) DNA ligase b) DNA polymerase
c) Endonuclease d) Helicase

23) A modified dihybrid Mendelian ration of 9 : 3 : 4 indicates

a) Supplementary gene b) Complementary gene
c) Epistatic gene d) Duplicate gene

24) A complex ribosomes attached to a single strand of m-RNA is known as

a) Polypeptide b) Okazaki fragment
c) Polysome d) Lysosome

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