BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Sc.(Ag)-Hons-2022/B.Sc.(Ag)-Hons-2023
Course Name – Fundamentals of Genetics
Course Code - CC-BAG274(T)
(Semester II)

Full Marks : 50 **Time : 2:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 20=20

1. *Choose the correct alternative from the following :*

(i) Which terminolgy is appropriate if the inheritance is passed maternally only-

a) Uniparental inheritance b) Biparental inheritance
c) Both Uniparental and Biparental inheritance d) None of these

(ii) Who proposed the 'Theory of Pangenesis' ?

a) Lamarck b) Wolff
c) Charles Darwin d) August Weismann

(iii) Select the right amino acid replacing Glutamine at 6th position of the polypeptide chain of hemoglobin in case of sickle cell anemia-

a) Glycine b) Histidine
c) Glutamic acid d) Valine

(iv) Under monohybrid cross, which genotypic ratio in F2 would be expected if it is derived from the selfing of F1-

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

(v) Infer the correct terminology against the following statement-'A chromosome with median position of centromere'-

a) Metacentric b) Sub-metacentric
c) Telocentric d) Acrocentric

(vi) Who proposed the genic balance theory in Drosophila in case of sex determination?

a) McLung b) Morgan
c) Bridges d) Bateson and Punnett

(vii) Infer the sextual orientation of an individual for fruit fly , if the ratio of the chromosomes X/A = 1.

a) Male
b) Female
c) Gynandromorph
d) Meta Female

(viii) Label the right crrossing technique if we want to determine the exact zygocity in F1 in case of cross between 2 pureline parents with contrasting traits.

a) Selfing
b) Testcross
c) Reciprocal cross
d) Back cross

(ix) Which statement is right?

a) Codons are written in 5 to 3 direction whereas anticodons are usually written in 3 to 5 direction.
b) Codons are written in 3 to 5 direction whereas anticodons are usually written in 5 to 3 direction.
c) Codons are written in 5 to 5 direction whereas anticodons are usually written in 3 to 5 direction.
d) Codons are written in 5 to 3 direction whereas anticodons are usually written in 5 to 5 direction.

(x) Which one of the codon is considered as Initiation Codon ?

a) UGA
b) UAA
c) UAG
d) AUG

(xi) In a DNA, if the amount of Guanine is 35% then what will be the amount of Adenine base to be expected?

a) 0.35
b) 0.7
c) 0.15
d) 0.3

(xii) Relate the condition with appropriate term, if one extra chromosome is found in human in following fashion -(2n+1).

a) Euploid
b) Monosomic
c) Trisomic
d) Tetrasomic

(xiii) In which phase of the meiosis, the synaptonemal complex develops ?

a) Leptotene
b) Zygotene
c) Pachytene
d) Diplotene

(xiv) Lac operon is the best example for which one of the following operon?

a) Inducible operon
b) Attenuation
c) Repressible operon
d) Both Inducible and Repressible operon

(xv) Name the measuring unit of genetic distance among any two genes situated within a chromosome.

a) Map Unit
b) Centimorgan
c) Both Map unit and Centimorgan
d) Crossing over

(xvi) Which one of the following enzymes involved in transcription?

a) DNA Polymerase I
b) DNA Polymerase III
c) RNA Polymerase
d) DNA Polymerase II

(xvii) During transcription of an operon, RNA polymerase binds to which component of gene?

a) structural genes
b) regulator gene
c) operator
d) promoter

(xviii) Relate the Epistasis with follwing gene action-

a) Intragenic Interaction
b) Intergenic Interaction
c) Linkage
d) Interallelic Interaction

(xix) Haemophilia in man is due to which type of inhertance ?

a) Sex-linked inheritance
b) Sex-limited inheritance
c) Sex-influenced inheritance
d) Primary non-disjunction

(xx) A mutation in a codon leads to the substitution of one amino acid with another. What is the name for this type of mutation?

a) nonsense mutation
b) missense mutation
c) frameshift mutation
d) operator mutation

Group-B

(Short Answer Type Questions) 2.5 x 10=25

2. Develop a basic idea on 'Splicing mechanism of RNA'. (2.5)
3. What is the phenotypic ratio of F2 generation in dihybrid cross and What is the genotypic ratio of F2 generation in monohybrid cross? (2.5)
4. What are homozygous and heterozygous conditions? (2.5)
5. Demonstrate any four characteristic features of sex-linked inheritance. (2.5)
6. What are multiple alleles? Give examples. (2.5)
7. What is dominant epistasis? Give a suitable example. (2.5)
8. What are the enzymes involved in DNA replication? Write the names only. (2.5)
9. Explain with diagram the process of inversion. (2.5)
10. Write an outline on - rRNA and tRNA. (2.5)
11. Simplify law of independent assortment with an example. (2.5)

OR

Distinguish between- Karyotypes and Ideotypes. (2.5)

Group-C

(Long Answer Type Questions) 5 x 1=5

12. Inspect the reason of success of Mendel's experiment. (5)

OR

Elaborate with neatly labeled diagram, the process of meiotic division. (5)

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