VCD/ 27/10/2023 BOTANY – II SEMESTER III MARKS-100 DURATION - 3 HRS

Note the below:

1. **All the questions are compulsory.**
2. **Draw neat & suitable diagrams wherever necessary.**
3. **Figures to the right indicate full marks.**

Q 1. A. Choose the correct option & rewrite the statements: **(10 Marks)**

1. DNA synthesis takes place during_____ phase.
   a. M phase b. G2 phase c. G1 phase d. S phase
2. A protein complex that links sister chromatids, is _____.
   a.actin b. cohesin c. myosin d.actomyosin
3. Genetic information stored in mRNA is translated to polypeptide by _____.
   a.Ribosome b.Nucleus c. Endoplasmic reticulum d. Golgi apparatus
4. Inside the cell, H2O2 clearance is brought about by_____.
   a.Peroxisome with enzyme amino oxidase b. Glyoxysome with the enzyme catalase c. Glyoxysome with enzyme isocitrate lyase d. Peroxisome with the enzyme catalase
5. If the ratio between X-chromosomes and autosome genome is equal to 0.5 then the drosophila fly is _____ according to genic balance theory.
   a. Intersex b. super female c. female d. male
6. _____ mechanism of sex determination is found in birds.
   a. XX-XY b. XX- XO c. ZZ- ZW d. ZZ- ZO
7. _____ is a rare type of translocation in which the broken end gets attached to the telomere end of a non-homologous chromosome.
   a. Reciprocal translocation b. terminal duplication c. Shift translocation d. simple translocation
8. _____ is an inactivated X-chromosome found in females at the periphery of the nucleus.
   a. Barr body b. inclusion bodies c. tumor d. breast cancer
9. Transcription involves rewriting of the genetic message coded in _____ into RNA molecules.
   a. protein b. coding strand c. DNA d. RNAP
10. The Sigma subunit recognises the _____ signal on DNA molecules.
    a. Core b. Start c. stop d. Operon

Q 1. B Answer the following in one sentence **(10 Marks)**

a. What is the group of proteins in the peroxisomal membrane called?
b. Who first introduced the term Mitochondria?
c. What are dioecious plants ? Give two examples.
d. What are paracentric and pericentric inversions?
e. What is splicing?

Q 2. Answer the following questions (Any two) **(20 Marks)**

1. Explain Ultrastructure of Mitochondria with neat and labelled diagrams.
2. What is Glyoxysome? Explain their structure, function and Biogenesis.
3. Write difference between Mitosis and Meiosis.
4. Explain briefly the structure of DNA .

Q 3. Answer the following questions (Any two) **(20 Marks)**

1. What are Chromosomal aberrations? Give the types of Duplications.
2. Describe XX-XY sex determination system in humans. add a note on baldness in man
3. Joe is a Colorblind male calculate the percentage of affected children of following crosses
   a. Joe X Normal Female (Joe marries a normal female)
   b. Joe X Carrier Female (Joe marries a carrier female)
4. With reference to Haemophilia, carry out the following crosses to compute the percentage of progenies affected with the disorder and percentage of progenies not affected.
   a. Haemophilia female and Haemophilia male
   b. Carrier female and Normal male

Q 4. Answer the following questions (Any two) **(20 Marks)**

1. What is replication? Discuss the three models of replication. Give the list of enzymes in the process of replication.
2. Describe Meselson and Sthals experiment to prove replication of DNA is semiconservative.
3. Discuss the different types of promoters in eukaryotes.
4. Explain mechanism of transcription in prokaryotes.

Q 5. Short Notes (Any four) **(20 Marks)**

1. Leptotene
2. Z- DNA
3. Genic Balance theory of sex determination.
4. Explain Deletion and its types.
5. Central Dogma of protein synthesis.
6. Differentiate between prokaryote and Eukaryote replication.

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