2020

Time : 3 hours *Full Marks : 80*

Candidates are required to give their answer in their own words as far as practicable.

***Figures** in the margin indicate full marks.*

*Answer **five** questions in which **Q.No.1** is compulsory.*

Choose the correct option from the following: $1 \times 16 = 16$

(a) Z-DNA helix shows:

(i) Left hand coiling

(ii) 12 base pairs/turn

(iii) opposite orientation of adjacent nucleotides

(iv) All of the above

(b) The synthesis of DNA by DNA polymerase occurs in the direction of:

(i) $3' \rightarrow 3'$

(ii) $3' \rightarrow 5'$

(iii) $5' \rightarrow 3'$

(iv) $5' \rightarrow 5'$

(c) The modified ratio 9 : 6 : 1 refers to:

(i) Additive genes

(ii) Complementary genes

(iii) Duplicate genes

(iv) Supplementary genes

(d) The chromosome theory of inheritance was postulated by:

(i) Bateson and Punnet

(ii) Beadle and Tatum

(iii) Schlienden and Schwann

(iv) Sutton and Boveri

(e) Sex chromosomes are called:

(i) Allosomes

(ii) Autosomes

(iii) Nucleosomes

(iv) Polysomes

(f) The types of gametes produced by an organism having a geno types AaBbDd are:

(i) 4

(ii) 8

(iii) 16

(iv) 64

(g) Segregation of Mendelian factors occurs during:

(i) Anaphase-I

(ii) Anaphase-II

(iii) Metaphase-I

(iv) Metaphase-II

(h) The bread wheat (**Triticum Aestivum**) is:

(i) Diploid

(ii) Triploid

(iii) Tetraploid

(iv) Hexaploid

(i) The meiotic products of a paracentric inversion heterozygote include:

(i) Acentric chromosome

(ii) Dicentric chromosome

(iii) Normal chromosome

(iv) All of the above

(j) Lamp brush chromosomes are also called:

(i) Diplotene chromosomes

(ii) Polytene chromosomes

(iii) Satellite chromosomes

(iv) None of the above

(k) A sterile female with webbed neck and sex complement as XO suffers from:

(i) Down Syndrome

(ii) Edward Syndrome

(iii) Turner Syndrome

(iv) None of the above

(l) Who used of all X-rays as mutagens to induce mutation?

(i) Morgan

(ii) Muller

(iii) Stadler

(iv) Sturtevant

(m) Which variety of wheat is responsible for green revolution in India?

(i) Kalyan Sona

(ii) Sharbati Sonora

(iii) Sonora 64

(iv) All of the above

(n) Transduction was discovered in the bacterium:

(i) **Diplococcus pneumoniae**

(ii) **Escherichia Coli**

(iii) **Salmonella typhimurium**

(iv) **Streptococcus mutans**

(o) Which of the following is known as 'Griffith effect'?

(i) Conjugation

(ii) Transformation

(iii) Transduction

(iv) All of the above

(p) Hardy-Weinberg Equilibrium is applicable for a population having:

(i) Infinite Size

(ii) Random mating

(iii) No selection

(iv) All of the above

What do you mean by interaction of genes? With the help of one example of each, explain any two modified rations of the following: 4+12=16

(a) 9 : 7

(b) 13 : 3

(c) 9 : 3 : 4

(d) 15 : 1

Define genetic map. Describe the procedures involved in genetic mapping. 4+12=16

Distinguish between any **four** of the following: 4×4=16

) Dominance and Epistasis

) DNA and RNA

) Euchromatin and Heterochromatin

) Genotype and Phenotype

Homozygous and Heterozygous

mRNA and tRNA

Transformation and Transduction

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5. Describe chemical nature and ultrastructure of eukaryotic chromosome 16

6. What is translocation? Describe the cytological behaviour of translocation heterozygote. 6+10=16

7. Discuss the role of any two mutagens of the following: 2×8=16

   (a) 5-Bromouracil

   (b) Hydroxylamine

   (c) Nitrous acid

   (d) UV-rays

8. Give an account of extra chromosomal inheritance with suitable examples. 16

9. Write short notes on any two of the following: 2×8=16

   (a) Chromosome banding

   (b) Interference

   (c) Klinefelter Syndrome

   (d) Repetitive DNA

   (e) Sex linkage

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