[Time: 3 Hours] **[Marks:100]**

Please check whether you have got the right question paper.

N.B: 1. **All** questions are compulsory.
2. **Figures** to the right indicate full marks.
3. Draw **neat and labelled** diagrams wherever necessary.

Q.1 A) Choose the correct option from the following and **REWRITE** the sentence. [10]

i) The two subunits of prokaryotic ribosomes are_____.
a) 60 S & 40S
b) 50S & 30S
c) 60S & 30S
d) 70S &30S

ii) Pairing of homologous chromosomes is seen during_____.
a) Leptotene
b) Zygotene
c) Pachytene
d) Diplotene

iii) DNA was first described by Watson & Crick in the year_____.
a) 1952
b) 1962
c) 1953
d) 1964

iv) Due to deletion of a segment in_____ chromosome, Cri du chat syndrome is observed in human beings.
a) 3^{rd}
b) 5^{th}
c) 9^{th}
d) 10^{th}

v) In *Melandrium* plant_____ method of sex determination is observed.
a) XX-XO
b) XX-XY
c) ZW-ZZ
d) ZO-ZZ

vi) _____is an example of sex influenced character in humans.
a) Colour blindness
b) Haemophilia
c) Baldness
d) Eye Colour

vii) Streptomycin resistance in *Chlamydomonas* is an example of_____ inheritance.
a) Cytoplasmic
b) X-linked
c) Multiple allelic
d) Polygenic

viii) In _____ mode of DNA replication both the daughter molecules have one parental strand and one newly synthesized strand.
a) Conservative
b) Semi-conservative
c) Disruptive
d) Continuous

ix) _____protein binds to single-stranded DNA, and prevents it from forming duplex DNA.
   a) DSB
   b) SSB
   c) TSB
   d) PSB

x) The subunit _____is loosely attached to the core enzyme of RNA polymerase.
   a) alpha
   b) beta
   c) sigma
   d) gamma

B) **Answer the following in one or two sentences:** [10]

i) What are cristae?
ii) What is Karyokinesis?
iii) What are duplications with reference to chromosomal aberrations?
iv) Give 2 examples of ZO- ZZ type of sex determination.
v) What do you mean by replicon?

Q.2 **Answer any two of the following:** [20]

i) Describe the ultra-structure of prokaryotic ribosome. Add a note on its function.
ii) Describe the various phases of cell cycle. Add a note on its significance.
iii) Explain A & Z forms of DNA.
iv) Describe briefly the structure of m-RNA. Add a note on its function.

Q.3 **Answer any two of the following:** [20]

i) What are chromosomal aberrations? Discuss translocations with reference to their origin and genetic effects in human beings.
ii) Explain the methods of sex determination in homogametic females with suitable examples.
iii) What is sex linked inheritance? Explain it with reference to eye colour in *Drosophila.*
iv) What is cytoplasmic inheritance? Explain it with reference to plastid transmission in *Mirabilis jalapa.*

Q.4 **Answer any two of the following:** [20]

i) Describe the experiment to prove that DNA replication is semi-conservative.
ii) Explain the role of various enzymes involved in prokaryotic DNA replication.
iii) Explain the process of transcription in Prokaryotes.
iv) Describe the mechanism of m - RNA processing in eukaryotes.

Q.5 **Write short notes. (Any Four)** [20]

i) Peroxisomes
ii) Significance of mitosis
iii) Inversions
iv) Genic balance theory of sex determination
v) Central dogma
vi) Male sterility in maize.

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