

[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<sup>rd</sup>
  - b) 5<sup>th</sup>
  - c) 9<sup>th</sup>
  - d) 10<sup>th</sup>
- 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.
- DSB
  - SSB
  - TSB
  - PSB
- x) The subunit \_\_\_\_\_ is loosely attached to the core enzyme of RNA polymerase.
- alpha
  - beta
  - sigma
  - gamma

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

[10]

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

**Q.2 Answer any two of the following:**

[20]

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

**Q.3 Answer any two of the following:**

[20]

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

**Q.4 Answer any two of the following:**

[20]

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

**Q.5 Write short notes. (Any Four)**

[20]

- Peroxisomes
- Significance of mitosis
- Inversions
- Genic balance theory of sex determination
- Central dogma
- Male sterility in maize.

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