



**MCQ-003-001518** Seat No. \_\_\_\_\_

**B. Sc. (Sem. V) (CBCS) Examination**

**May / June - 2018**

**BT - 502 : Genetics & Molecular Biology**

**Faculty Code : 003**

**Subject Code : 001518**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) Section-I covers **compulsory one** mark questions of **20** marks.
- (2) Figures in the **right** indicate marks of the question.

**SECTION - I**

- 1 One mark objective questions : **20**
- (1) \_\_\_\_\_ coined the term Gene.
  - (2) In Epistasis, inhibited gene is called \_\_\_\_\_.
  - (3) Mendel's law of independent assortment is applied only to those genes which are located on same chromosome. TRUE / FALSE.
  - (4) If the chromosomal aberration in number is represented as  $2n+1$  then it is known as \_\_\_\_\_.
  - (5) In prokaryotes, extra nuclear inheritance is performed by episomes and \_\_\_\_\_.
  - (6) The diameter of basic form of DNA is \_\_\_\_\_ nm.
  - (7) \_\_\_\_\_ enzyme helps to relax the supercoiling by nicking one or both strands of DNA.
  - (8) In 1958, Meselson and Stahl proved the \_\_\_\_\_ mode of DNA replication.

- (9) Lagging strand in DNA replication is synthesized discontinuously as \_\_\_\_\_ fragments.
- (10) \_\_\_\_\_ discovered the first transposable element in a study of maize plant.
- (11) \_\_\_\_\_ factor is loosely bound to core polymerase and forms prokaryotic RNA Polymerase.
- (12) \_\_\_\_\_ is start codon
- (13) Ribosomes are the sites of transcription. TRUE / FALSE.
- (14) In lac operon, \_\_\_\_\_ encodes  $\beta$ -galactosidase.
- (15) Restriction enzymes of different organisms that recognise the identical sequence to cut the DNA are called \_\_\_\_\_.
- (16) Full form of UC in pUC 8 vector is \_\_\_\_\_.
- (17) Cosmids are the hybrid vectors derived from plasmids containing cos site of \_\_\_\_\_ phage.
- (18) In 1975, Screening of recombinants by colony hybridisation method was devised by \_\_\_\_\_ and \_\_\_\_\_.
- (19) Griffith discovered the \_\_\_\_\_ principle in 1928, which gave the idea that genetic material is nucleic acid.
- (20) In DNA if base is uracil then nucleoside is \_\_\_\_\_.

**2** (a) Write any **three** out of **six** :

- (1) Write a note on "cosmids".
- (2) Enlist the characteristics of an ideal vector.
- (3) Describe Gene cistron relationship in prokaryotes.
- (4) What are different types of restriction endonucleases ?
- (5) Write short note on genetic code.
- (6) State Chargaff's principle.

- (b) Write any **three** out of **six** : **9**
- (1) What are major steps of gene cloning ?
  - (2) What is Griffith's effect ? Explain.
  - (3) What is SOS repair mechanism ? Explain.
  - (4) Describe Hardy-Weinberg Law of equilibrium.
  - (5) What is frame shift mutation ? Explain.
  - (6) Write a note "Lac operon".
- (c) Write any **two** out of **five** : **10**
- (1) Describe the process of post transcriptional modification.
  - (2) Write a note on "Photo reactivation".
  - (3) Explain extra-nuclear inheritance with an example.
  - (4) Write a note on "Chromosomal aberration".
  - (5) "DNA replication is semi-conservative in nature" – Justify.
- 3** (a) Write any **three** out of **six** : **6**
- (1) Write a note on "Inducible genes".
  - (2) What are lethal genes ? Exemplify.
  - (3) What is Homopolymer tailing ?
  - (4) What is C-value paradox ?
  - (5) What is Okazaki fragment ? Describe.
  - (6) What is the Law of Independent Assortment ?
- (b) Write any **three** out of **six** : **9**
- (1) Write a short note on "Linkage".
  - (2) What is Transduction ? Explain.
  - (3) Write a note on "Structure of t-RNA".
  - (4) Differentiate RNA Polymerase and DNA polymerase.
  - (5) Describe mechanism of conjugation.
  - (6) Describe polynucleotide kinase and alkaline phosphatase.

(c) Write any **two** out of **five** : **10**

- (1) What is Trp operon ? Explain.
  - (2) Briefly explain the process of prokaryotic DNA replication.
  - (3) Write a note on applications of genetic engineering in various fields.
  - (4) How would you identify recombinants ? Explain.
  - (5) What is difference between Test Cross and Back Cross ?
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