

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 2017

GENETICS & MOLECULAR BIOLOGY

(Biotechnology)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What are the laws postulated by Mendel which form the basis for the modern genetics and molecular biology.
(b) What was Mendel historic experiment which led to the law of segregation and independent assortment of characters? Explain with example.
- 2 (a) What is a chromosome? Explain how this is packed inside the nucleus.
(b) Write brief notes on:
(i) Structure and function of the centrosome.
(ii) Structure and function of a telomere.
- 3 (a) What is Karyotyping? How does this process help in identification of somatic and sex chromosomes?
(b) Explain how the sex determination is done in animals and plants.
- 4 (a) Why is DNA a double helix? Explain with reference to its composition and the physical forces in play.
(b) What is RNA and its function? Explain the differences between DNA and RNA.
- 5 (a) What are the different forms of RNA present in the cell? Giving their characteristic features explain their role in the cell.
(b) Discuss about the post-translational process that determine a coding mRNA.
- 6 (a) What is the role of RNA polymerase in transcription? Do they differ in Prokaryotes and Eukaryotes? Discuss.
(b) Describe the post-translational modifications inside the cell leading to maturation of the product.
- 7 (a) What is an operon? Who coined this term? Explain the components and mechanism of a typical prokaryotic operon system.
(b) Taking Lac operon as an example, explain the gene regulation process leading to lactose metabolism in E.coli.
- 8 (a) What are blotting techniques, list them? Why are they used in genetic engineering and molecular biological techniques?
(b) Distinguish between western and north-western blotting and write about their applications.
