Code : BSC-109 (100301)

B.Tech 3rd Semester Special Exam., 2020

(New Course)

BIOLOGY

(Biology for Engineers)

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Choose the correct alternative from any *seven* of the following multiple choice questions : 2×7=14

(a) Which of the following was a major discovery of molecular biology when the adenovirus replication strategy was uncovered?

(i) The function of RT

(ii) Mechanism of replication of DNA

(iii) The importance and frequency of mRNA splicing

(iv) The speed of action of viral DNA dependent DNA polymerase

(b) The movement of particles in liquids and gases is observed as

(i) Bruneian motion

(ii) Brownian motion

(iii) Blackian motion

(iv) Randomium motion

(c) The continuous motion of tiny particles (atoms) is termed as

(i) potential model of atoms

(ii) kinetic model of matter

(iii) potential model of matter

(iv) kinetic model of atoms

(d) The first experiment regarding evolution of life on earth was proposed by

(i) Watson and Crick

(ii) Oparin and Haldane

(iii) Urey and Miller

(iv) Meselson and Stahl

(e) Which blood type would not be possible for children of a type AB mother and a type A father?

(i) O

(ii) A

(iii) B

(iv) AB

(f) A strand of DNA with the sequence AACTTG will have a complementary strand with the sequence

(i) CCAGGT

(ii) AACTTG

(iii) TTCAAG

(iv) TTGAAC

(g) Which of the following crosses will give a 1 : 2 : 1 genotypic ratio?

(i) Aa × Aa

(ii) Aa × AA

(iii) AA × Aa

(iv) AA × aa

(h) Which of the following is a postulate of Mendel?

(i) During gamete formation, segregating pairs of unit factors assort independently of each other

(ii) During the formation of gametes, the paired unit factors separate or segregate randomly

(iii) Hereditary characteristics are controlled by particulate unit factors that exist in pairs in individual organisms

(iv) All of the above

(i) Credit for discovery of cell goes to

(i) Robert Brown

(ii) Robert Hooke

(iii) von Mohl

(iv) Robertson

(j) Histones are found in

(i) nucleus

(ii) vacuole

(iii) lysosome

(iv) spherosome

2. Give an illustrated account of the fine structure of a plant cell and describe the function of the different cell organelles. 14

3. Briefly describe the mechanism of protein synthesis in eukaryotic cell. 14

4. Write the genetic consequences of linkage and crossing. 14

5. Explain the laws of thermodynamics especially with relation to biological systems. 14

6. Describe the different theories on the origin of life on earth. 14

7. If you could not have a microscope, how would you determine whether a cell is prokaryotic or eukaryotic? Suppose that the organism can be easily found in the laboratory. 14

8. What is genetic code? Write the properties of genetic code. 14

9. Write notes on any *two* of the following : 7×2=14

   (a) Sterilization methods of media and laboratory wares

   (b) Primary, secondary and tertiary structure of protein

   (c) Calvin cycle for photosynthesis

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