Reg. No.															

B.Tech. DEGREE EXAMINATION, DECEMBER 2019
First to Eighth Semester

15BT101 - BIOLOGY FOR ENGINEERS
(For the candidates admitted during the academic year 2015-2016 to 2017-2018)

Note:
(i) **Part - A** should be answered in OMR sheet within first 45 minutes and OMR sheet should be handed over to hall invigilator at the end of 45th minute.
(ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: Three Hours Max. Marks: 100

PART – A (20 × 1 = 20 Marks)
Answer **ALL** Questions

1. Genetic variation in haploid cells is produced during _____ process
   (A) Mitosis (B) Transcription
   (C) Meiosis (D) Translation

2. Which structure holds the two homologues sister chromatids to the spindle fibers?
   (A) Astral rays (B) Centromere
   (C) Kinetochore (D) Chromatin

3. Which is a weak force in the protein structure?
   (A) Hydrogen bonds (B) Van der waals forces
   (C) Electrostatic interactions (D) Disulfide bond

4. Which of the following is a FALSE statement on spindle fibers?
   (A) Spindle fibers are attached to centromere (B) spindle fibers helps in chromosome condensation
   (C) Spindle fibers attach to kinetochores of chromosome (D) Spindle fibers are made up of microtubules

5. All the chemicals that form the basis of life are formed by _____, which are aggregates of atoms linked by chemical bonds.
   (A) Molecules (B) Ions
   (C) Matters (D) Compounds

6. _____ provide goods for human use.
   (A) Financial resources (B) Neural resources
   (C) Non-renewable resources (D) Biological resources

7. Fatty acids are composed of chain of methylene groups with a group at one end.
   (A) Amine functional group (B) Carboxyl functional group
   (C) Alkyl functional group (D) Carbonyl functional group

8. In _____ Watson and Crick proposed a model to explain the arrangement of molecules in DNA.
   (A) 1953 (B) 1951
   (C) 1935 (D) 1983

9. In _____ inhibition and inhibitor binding site is different from the substrate binding site.
   (A) Irreversible (B) Reversible competitive
   (C) Reversible non competitive (D) Irreversible competitive

10. Unwanted proteins are degraded to simpler units of amino acid and recycled to form new proteins is referred to as _____
   (A) Reduction (B) Half-life
   (C) Turnover (D) Catalysis

11. The aqueous space within the chloroplast is called _____
   (A) Stroma (B) Thylakoid
   (C) Lumen (D) Granum

12. Which of the following compounds is an electron acceptor in the light reaction of photosynthesis?
   (A) Chlorophyll (B) NADP
   (C) CO_2 (D) H_2O

13. Molecular machines are in the range of
   (A) Micrometer (μm) (B) Nanometer (nm)
   (C) Picometer (pm) (D) Millimeter (mm)

14. ENFET biosensors is primarily used for detection of _____
   (A) pH (B) Temperature
   (C) Glucose concentration (D) Drug concentration

15. The best pH range for bioremediation process is
   (A) 6.5 – 7.5 (B) 7.5 – 8.5
   (C) 9.5 – 10.5 (D) 3.5 – 4.5

16. Which of the following is NOT a linear motor?
   (A) Dynein (B) Kinesin
   (C) Myosin (D) Flagellar motor

17. The largest portion of the brain is called
   (A) Cerebellum (B) Cerebrum
   (C) Pituitary gland (D) Medulla oblongata

18. Which of the following is NOT a secondary lymphoid organ?
   (A) Spleen (B) Tonsils
   (C) Thymus (D) Lymph nodes

19. Cytokines are secreted by
   (A) Red blood cells (B) Neurons
   (C) White blood cells (D) Nephrons

20. G-protein is involved in _____
   (A) Amino acid synthesis (B) Replication
   (C) Humoral immunity (D) Cell signaling

PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions

21. Mention the differences between prokaryotes and eukaryotes.
22. Write the experimental evidence of cell theory.
23. Mention the types of non-covalent interactions.
24. Define Chargaff's rule.
25. Discuss the thermodynamic principle behind enzyme action.
26. Define *In-situ* bioremediation.
27. Write short notes on intracellular signaling.

PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions

28. a. Write in detail on
   (i) Forces influencing proteins structure
   (ii) Structure and function of proteins

(OR)

b. Elaborate on the comparison and significance of mitosis and meiosis.

29. a. Describe the mechanism of translation in prokaryotes.

(OR)

b. Write the sources of stem cell and discuss on its applications.

30. a. Discuss the Calvin cycle with relevant diagrammatic representations.

(OR)

b. Explain the effects of temperature, pH and substrate concentration on enzyme activity.

31. a. Explain the role of cytoskeleton in generation of movements.

(OR)

b. Elaborate the applications and principles of biosensors.

32. a. Describe in detail about the computer based neural networks.

(OR)

b. Discuss on the major events in primary and secondary immune responses.

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