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Roll No.....

B. Tech –I yr (Group 2)

Final Exam, February 2018

CB102: Biology

Time: 2:00 Hours **Max. Marks: 80**

Notes: 1. Attempt all Parts of the question paper.

2. Assume suitable missing data, if required.

Part-A

True/False type questions **(1X10 = 10)**

1. In mRNA, A is always paired with U and G is always paired with C.
2. Cynobacteria are the special class of bacteria which has machinery for CO_2 fixation through photosynthesis.
3. Among all the living cells, only bacteria have flagella for their motion.
4. The correct order for the Classification tools for characterization of living organisms is: ***Kingdom>Phylum>Class>Order>Family>Genus> Species***
5. Chief component of cell wall, **peptidoglycan** is a large polymer composed of N-acetylglucosamine and N-acetylmuramic acid.
6. Cellulose is a polymer of glucose molecules linked through β-1,4 linkages.
7. All enzymes are protein and **NO biomolecule** other than protein can catalyze a biochemical reaction.
8. Transcription is the first stage of gene expression.
9. Non coding regions in mRNA are called exons
10. In prokaryotes genome, there is only single origin site for DNA replication whereas eukaryotic genome may have multiple origin sites.

Part-B

Subjective answer type questions **(12.5X4 = 50)**

1. What are the different branches of biology? Discuss the relationship of biology with other branches of science and engineering.

2. **(A)** One bunch of bacterial cells was collected from a local dumping site. Will it be pure culture of single type of bacteria or it shall contain different type of bacteria. Justify your answer. **(B)** Discuss the methodology for the test which is used to characterize the bacterial cells based on their cell structure and composition.

3. Insulin is a hormone made by the pancreas that allows your body to use sugar (glucose) from carbohydrates in the food that you eat for energy or to store glucose for future use. **(A)** Chemically, insulin is a molecule of : protein, or nucleotide or Lipopolysaccharide or lipid? **(B)** Name the disease which occurs due to deficiency of insulin in human body and **(C)** If the insulin can only be synthesized by human, discuss how you it can be produced commercially using microbial cultures. **[Hint:** ***recombinant DNA technology was developed during 1972-73***]

4. What are the major bio-molecules? Discuss in detail.

Part-C

Differentiate between ANY Four pairs (*Maximum word limit: 30*) **(2.5 X 4 = 10)**

1. Lichen and Algae
2. Amino acid and polypeptide
3. Polypeptide bond and phophodiester bond
4. Plasmid and chromosome
5. Sticky and blunt ends in DNA
6. DNA replication and Transcription

Part-D

Match the following enzymes with their specific functions **(1X10 = 10)**

S.No.	Enzyme	S.No.	Function
1.	Helicases	1.	synthesis of new DNA strand
2.	DNA polymerase	2.	Cellulose hydrolysis
3.	Topoisomerases	3.	seals nick via phosphodiester linkage
4.	Cellulase	4.	RNA primer synthesis
5.	Endonucleases	5.	Prevents torsion by DNA breaks
6.	Primase	6.	Protein hydrolysis
7.	RNA polymerase	7.	Attaches a phosphate group to a high energy bond such as ADP
8.	Spliceosomes	8.	Cut the DNA
9.	Kinase	9.	RNA splicing
10.	Protease	10.	Transcription
		11.	Protein synthesis

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