

Name:	
Enrolment No:	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, January 2021**

**Course: B.Tech APE-Gas**  
**Programme: Biology for Engineers**  
**Course Code: HSFS2301**

**Semester: III**  
**Time: 03 hrs.**  
**Max. Marks: 100**

**Instructions:**

**SECTION A**

- 1. Each Question will carry 5 Marks**
- 2. Instruction: Complete the statement / Select the correct answer(s)**

S. No.		Marks	CO
Q 1	Discuss, with the help of an example, the integration of engineering with biological systems.	5	CO1
Q 2	How is prokaryotic ribosomes different from eukaryotic ribosomes?	5	CO2
Q 3	Discuss the role of nucleic acid in the cell.	5	CO2
Q 4	Describe the “fluid mosaic model” of a plasma membrane.	5	CO2
Q 5	How are carbohydrates significant to metabolism?	5	CO2
Q 6	Explain the principle of nonmaleficence.	5	CO4

**SECTION B**

- 1. Each question will carry 10 marks**
- 2. Instruction: Write short / brief notes**

Q 1	What do you understand by “central dogma of molecular biology”. Discuss in detail.	10	CO1
Q 2	With the help of a neat diagram, discuss the structure and function of nucleus, the control centre of the cell.	10	CO2
Q 3	(i) What is a nucleotide sequence database. Give an example. (ii) What do you understand by primary and secondary databases.	10	CO3
Q 4	Write short notes on: <ul style="list-style-type: none"> <li>• BLAST</li> <li>• FASTA</li> </ul>	10	CO3
Q 5.	What are the four bioethical principles? Give an example of a bioethical issue that was raised and dealt with	10	CO4

**SECTION-C**

- 1. Each Question carries 20 Marks.**
- 2. Instruction: Write long answer.**
- 3. Answer any one question**

Q 1	<p>Discuss the structure and function of four major macromolecules in the cell - carbohydrate, fats, proteins, and nucleic acids</p> <p style="text-align: center;">OR</p> <p>(i) What is BioMEMS. List four such devices with their applications.</p> <p>(ii) What are the major components of a biomems device. Describe the function of each.</p>	<b>20</b>	<b>CO3</b>