



Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2021

Course: B.Tech (ADE, ECE, EL, Mechatronics, ME, Civil, FSE, ASE, ASE-AVE)

Programme: Biology for Engineers

Course Code: HSFS2301

Semester: IV

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	Discuss how lipids are significant to metabolism.	5	CO2
Q 3	Differentiate DNA, RNA and protein.	5	CO3
Q 4	Write a short note on use of modelling for a biological system.	5	CO3
Q 5	Write any five characteristics of Silicon, which makes it a suitable substrate material for bio-MEMS devices?	5	CO4
Q 6	Explain the principle of nonmaleficence.	5	CO5

SECTION B

1. Each question will carry 10 marks

2. Instruction: Write short / brief notes

Q 1	Which cell organelle is the energy house of the cell and where is it located inside the cell. Discuss the ATP generation mechanism by this organelle	10	CO1
Q 2	(a) What are enzymes, give few examples? List out any four environmental factors, which affect enzymatic activity. (b) Write any three industrial applications of enzymes.	5+5	CO2
Q 3	(i) What are nucleotide sequence database? Which is the most commonly used. (ii) What do you understand by primary and secondary databases? Give examples. OR Write short notes on: • BLAST • FASTA	5+5	CO3
Q 4	Pick any one bio-MEMS device that you see in day-to-day life. With the help of a neat diagram, explain its various components, fabrication method and applications.	10	CO4

Q 5.	(a) What are the 10 elements of The Nuremberg Code (1947)? (b) Write a short note on the four bioethical principles.	5+5	CO5
SECTION-C			
1. Each Question carries 20 Marks. 2. Instruction: Write long answer. 3. Answer ALL question			
Q 1	(a) What do you understand by replication, transcription and translation? (b) With the help of a neat diagram, explain various steps involved in DNA replication (c) Explain any four applications of DNA	5+10+5	CO2