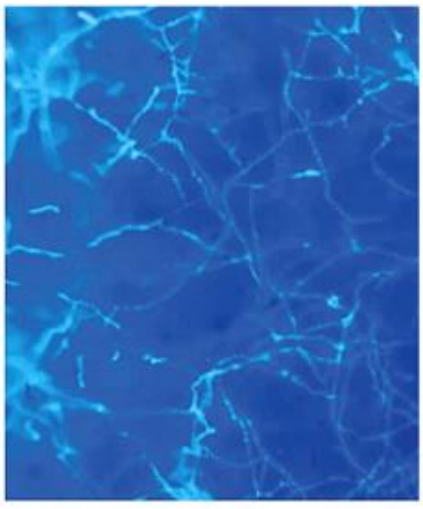
Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

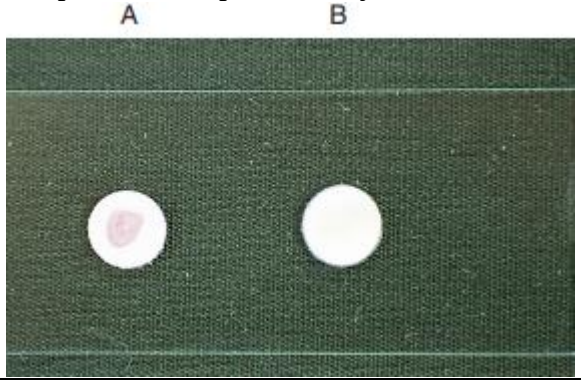
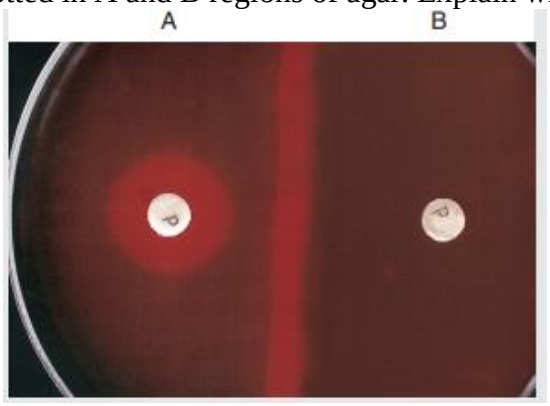
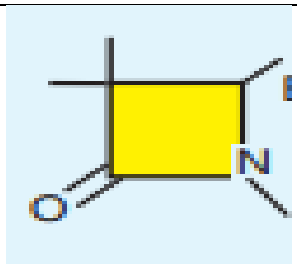
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2021

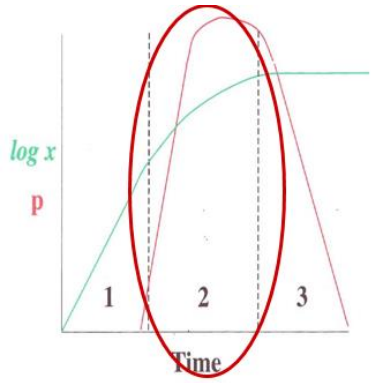
Course: Diagnostic and Industrial microbiology
Semester: II
Program: MSc. Microbiology **Time : 03 hrs.**
Course Code: HSMB 7016 **Max. Marks: 100**

Instructions:

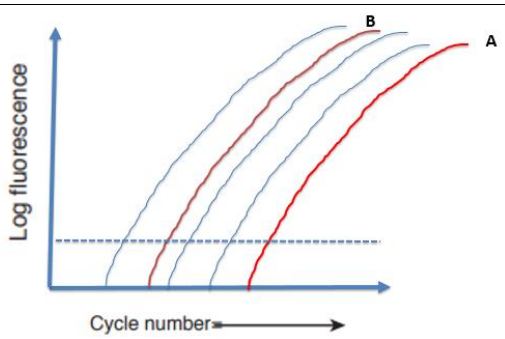
SECTION A

S. No.	MCQs or Fill in the blanks (1 marks each)	**30 Marks**	**CO**
1	CSF should be stored at 4^{o}C within 1 hour of sample collection. True/False	**1.5**	**CO1**
2	……. Is the microbial source of protease.	**1.5**	**CO6**
3	Identify the staining procedure. 	**1.5**	**CO2**
4	Production medium in case of Beer is extracted from …….. while in case of wine is …….....	**1.5**	**CO5**
5	……. is the medium to grow anaerobic bacteria.	**1.5**	**CO2**
6	…….. and …….are capnophiles.	**1.5**	**CO2**
7	…… and …….. are fluorescent dyes used in diagnostic microbiology.	**1.5**	**CO2**

8	There is a pink spot in positive sample. Identify the test. What is sample B called? 	**1.5**	**CO1**
9	Two bacterial cultures are spotted in A and B regions of agar. Explain whether A or B is resistant. 	**1.5**	**CO1**
10	Identify which class of antibiotic has this ring. 	**1.5**	**CO1**
11	Name a fermentation product produced under anaerobic conditions.	**1.5**	**CO4**
12	…… is an organic acid produced under aerobic conditions.	**1.5**	**CO4**
13	…… is a microbial secondary metabolite.	**1.5**	**CO5**
14	What is the encircled phase of growth in the following picture called? What is produced in this phase?	**1.5**	**CO5**

			
15	Which of the following carbohydrates are mainly present in whey? a) Glucose b) Lactose c) Fructose d) Sucrose	**1.5**	**CO3**
16	Microbial fermentation produces D optical isomers of the amino acids. a) True b) False	**1.5**	**CO6**
17	Which of the following raw materials are important for the production of glutamic acid? a) glycerol b) corn-steep liquor c) tryptone d) biotin	**1.5**	**CO4**
18	The purification and recovery of the production after fermentation is called a. Upstream process b. Downstream process c. Surface fermentation d. None of these	**1.5**	**CO5**
19	Citric acid is produced in aerobic conditions by the fungi a. Aspergillus b. Penicillin c. Mucor d. All of these	**1.5**	**CO4**
20	Give the scientific name of hops plant.	**1.5**	**CO4**
SECTION B the word limit 20 marks 4 questions 5 marks each			
Q	Short Answer Type Question (5 marks each) Scan and Upload 4 questions 5 marks each	**20 Marks**	**CO**
1	Explain the industrial production of Glutamic acid or Vit B12.	**5**	**CO6**
2	Explain with suitable illustration parts of a fermentor.	**5**	**CO4**

3	What is the role of normal microflora in diagnostic microbiology? Explain suitably. OR What are the important microscopic techniques used in diagnostic microbiology?	**5**	**CO1**
4	List the steps in industrial production of Penicillin or citric acid.	**5**	**CO5**
	SECTION C 30 marks		
Q	**Two case studies 15 marks each subsections**	**30 Marks**	**CO**
1	1. Tuberculosis/TB is a deadly disease. It is often found to co-exist with HIV. The TB pathogen takes about three weeks to grow on culture. It is also often drug resistant making TB treatment very difficult. A patient is suspected having TB and you are given sputum sample as well as blood for testing. Answer the following questions: i. What are the immediate tests you would take to identify the pathogen? (4 Marks) ii. Name the pathogen responsible for TB. What sample would you use for TB diagnosis? (1 Marks) iii. What sample will you prefer for HIV diagnosis? (1 Marks) iv. What controls would you use for diagnosis of TB? (2 Marks) v. How is quality control of sputum sample done in a diagnostic lab? (3 Marks) vi. Given that TB pathogen is often multi—drug resistant. What important information would you give to the patient? (4 Marks)	**15**	**CO1**
2	Case study 2 A protein was detected by ELISA as corona virus antigen (Test 1). A second test was done which gave the graph below. Here, two samples were tested together A and B (Test 2, picture shown below). Others in blue line are controls. Answer the following questions based on this information. i. What was used as a sample in Test 1 and what sample could have been used for Test 2? (2 Marks) ii. Which test can confirm better that its SARS COV-2 and not other corona viruses. Why do you think so? (3 Marks) iii. Name what is Test 2 (picture shown below). Where is this technique often used? (2 Marks) iv. What does the following graph tell about sample A and sample B? (3 Marks) v. Using another protein based method you want to confirm your ELISA results. What would you use? (1 Mark) vi. Explain any one method in detail Test 1 or Test 2 and what controls should be included. (4 Marks)	**15**	**CO3**

	 **Test 2**		
	SECTION- D 20 marks		
Q	Long Answer type Questions Scan and Upload (10 marks each) **word limit** (500 words)	**20 Marks**	**CO**
1	Explain industrial production of Beer. What is the difference between production of Beer and wine? (8+2 Marks)	**10**	**CO6**
2	Explain with the help of a flow sheet for developing an industrial microbial fermentation process OR The various methods of sterilization in the fermentation industry.	**10**	**CO4**