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

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

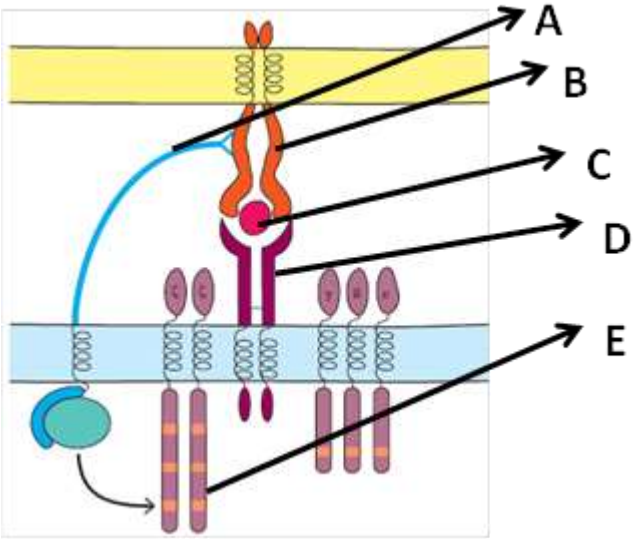
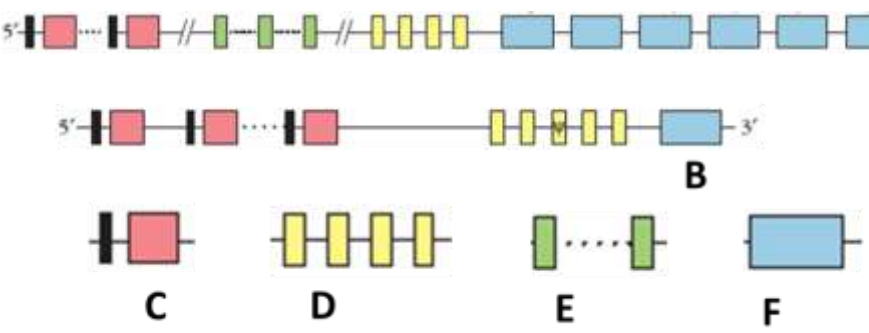
End Semester Examination, December 2020

Programme Name: M. Sc. Microbiology **Semester : I**
Course Name : Microbial phyology and Immunology **Time : 180min**
Course Code : HSMB7011 **Max. Marks : 100**

SECTION A

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

		Marks	
Q 1	Fill in the blank. a. ……. ,……. , and ……. all function as antigen-presenting cells. b. Only antigen-presenting cells express class …….MHC molecules, whereas nearly all other cells express class …… MHC molecules.	**5**	**CO1**
Q2	Match the following: a. Neutrophils — 1. Generally first cells to arrive at site of inflammation b. Eosinophils — 2. White blood cells that migrate into the tissues and play an important role in the development of allergies c. Kupffer cells — 3. Cells that are important in sampling antigens of the intestinal lumen d. Mast cells — 4. Macrophages found in the liver e. M cell — 5. Phagocytic cells important in the body's defense against parasitic organisms	**5**	**CO2**
Q3	Indicate whether each of the following statements is **true or false**. a. A large protein antigen generally can combine with many different antibody molecules b. Both TH cells recognize antigen that has been processed and presented with an MHC I molecule. c. Each MHC molecule binds a unique peptide. d. All antigens are also immunogens. e. T-cell receptors can only bind peptide-MHC complexes.	**5**	**CO3**
Q4	Identify the receptors and co-receptors of the following immunologic signaling events	**5**	**CO5**

			
Q5	Match the following a) TH i. has CD8 co-receptor b) Tc ii. Matured in bone marrow c) NK cell iii. Release antibody d) B-cell iv. Has CD4 co-receptor e) Plasma cell v. non-phagocytic killing of altered self cell	**5**	**CO1**
Q6	Identify **Light chain** and **heavy chain** germ line DNA from the following picture and mark the individual gene clusters (constant, variable, diversity and joining regions) 	**5**	**CO2**
SECTION B **1. Each question will carry 10 marks** **2. Instruction: Write short / brief notes**			
Q7	a. Draw an antibody and marked different parts b. Write a short note on antigen 5+5	**10**	**CO2**
Q8	Compare the four types of antigen-binding molecules used by the immune system—**antibodies, T-cell receptors, class I MHC molecules, and class II MHC molecules**—in terms of the following characteristics:	**10**	**CO3**

	a. Specificity for antigen b. Cellular expression(on which cell they expressed) c. Types of antigen recognized Or a. Compare MHC I and MHC II b. Compare B and T cell c. What is hapten ? 4+4+2		
Q9	Indicate to which branch(es) of the immune system the following statements apply, using **H for the humoral branch** and **CM for the cell-mediated** branch. **Some statements may apply to both branches**. a. …… Involves class I MHC molecules b. …….Responds to viral infection c. …….Involves T helper cells d. …….Involves processed antigen e. …….Most likely responds following an organ transplant f. …….Involves T cytotoxic cells g. …….Involves B cells h. …….Responds to extracellular bacterial infection i. …….Involves secreted antibody j. …….Kills virus-infected self-cells	**10**	**CO1**
Q10	a. Compare innate and adaptive immune response b. What is adjuvant and epitope c. Compare Ig M and Ig G. (4+2+4)	**10**	**CO2**
Q11	a. Compare humoral and cell-mediated immunity b. Describes four characteristics of inflammations (5+5) Or a. Describe step by step procedure of phagocytosis b. Compare Ig M and Ig G (5+5)	**10**	**CO2**
SECTION C **1. Each Question carries 20 Marks.** **2. Instruction: Write long answer.**			
Q12	a. What is MAC? Describe its formation by any of the complement activation pathway b. Compare TH and Tc cells c. What is vaccine? d. Write name of one bacterial two viral vaccines (10+5+5) Or a. What is apoptosis and necrosis? b. Write the importance of thymus in our immunity c. Compare active and passive immunization d. Define monoclonal antibody e. Write a short note on phagocytosis	**20**	**CO4**

	f. Full form of ITAM (4+5+4+2+4+1)		