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

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Distributed Computing **Semester: VII**

Program: B. Tech CS+CCVT & IT-INFRA **Time : 03 hrs.**

Course Code: CSEG4004 **Max. Marks: 100**

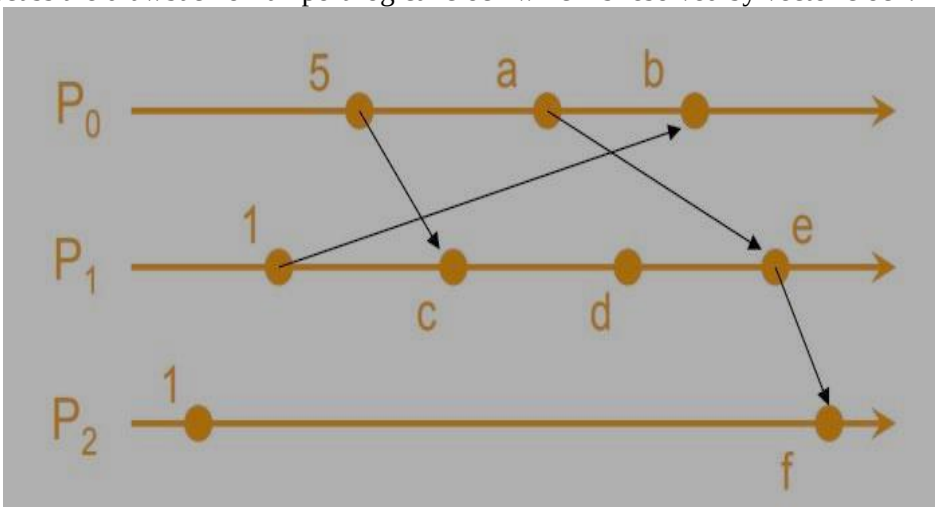
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Describe an example of a URL. List the three main components of a URL, stating how their boundaries are denoted and illustrating each one from your example. To what extent is a URL location transparent?	**4**	**CO1**
Q 2	Describe the approaches which are helpful in Load Balancing in Distributed Systems.	**4**	**CO4**
Q 3	Enlist some examples of distributed pervasive systems: home systems, electronic health-care systems, and sensor networks.	**4**	**CO1**
Q 4	The Election interface provides two remote methods: **Vote:** with two parameters through which the client supplies the name of a candidate (a string) and the 'voter's number' (an integer used to ensure each user votes once only). The voter's numbers are allocated sparsely from the range of integers to make them hard to guess. **Result:** with two parameters through which the server supplies the client with the name of a candidate and the number of votes for that candidate. Enlist which of the parameters of these two procedures are input and which are output parameters?	**4**	**CO3**
Q 5	Discuss the issue of naming applied to shared memory regions.	**4**	**CO2**

SECTION B

Q 6	Illustrate using some examples of faults in hardware and software that can/cannot be tolerated by the use of redundancy in a distributed system. To what extent does the use of redundancy in the appropriate cases make a system fault-tolerant?	**10**	**CO1**
Q 7	A client sends a 200 byte request message to a service, which produces a response containing 5000 bytes. Estimate the total time to complete the request in each of the following cases, with the performance assumptions listed below: i) Using connectionless (datagram) communication (for example, UDP); ii) Using connection-oriented communication (for example, TCP); iii) The server process is in the same machine as the client. [Latency per packet (local or remote, incurred on both send and receive):5 milliseconds Connection setup time (TCP only):5 milliseconds Data transfer rate: 10 megabits per second MTU:1000 bytes Server request processing time:2 milliseconds Assume that the network is lightly loaded.]	**10**	**CO4**
Q8	Explain how to use Java reflection to construct a generic dispatcher. Show Java code for a dispatcher whose signature is:	**10**	**CO2**

	public void dispatch(Object target, Method aMethod, byte[] args) The arguments supply the target object, the method to be invoked and the arguments for that method in an array of bytes. OR Discuss the Service Oriented Architecture with its design and development steps in detail.		
Q9	Categorize and discuss task assignment algorithm in distributed database. Discuss the various issues in designing good load balancing algorithm	**10**	**CO4**
SECTION-C			
Q 10	A file server uses caching, and achieves a hit rate of 80%. File operations in the server cost 5 ms of CPU time. when the server finds the requested block in the cache, and take an additional 15 ms of disk I/O time otherwise. Explaining any assumptions you make, estimate the server's throughput capacity (average requests/sec) if it is: i) single-threaded; ii) two-threaded, running on a single processor; iii) two-threaded, running on a two-processor computer. OR Categorize the various cloud computing service and discuss the characteristics of cloud computing.	**20**	**CO5**
Q 11	Discuss lamport logical clock and assign Lamport timestamps to the following events: Also discuss the drawback of lamport logical clock which is resolved by vector clock. 	**20**	**CO3**