UG Odd Semester (CBCS) Exam., December—2019

COMPUTER SCIENCE

(5th Semester)

Course No. : MCSCC–502

(Modelling and Simulation)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* What is simulation? When is simulation not an appropriate tool? 5

(b) A small grocery store has only one checkout counter. Customers arrive at this checkout counter at random from 1 to 8 minutes apart. Each possible value of interarrival time has the same probability of occurrence. The service times vary from 1 to 6 minutes with

the probabilities shown in the table below. The problem is to analyze the system by simulating the arrival and service of six customers :

Service time (in minutes)	*Probability*
1	0·10
2	0·20
3	0·30
4	0·25
5	0·10
6	0·05

Calculate—

(i) the average waiting time for a customer;

(ii) the probability that a customer has to wait in the queue;

(iii) the fraction of idle time of the server;

(iv) the average service time;

(v) the average time between arrivals;

(vi) the average time a customer spends in the system.

Use the following random number :

Random digits for arrival	913	111	15	948	309	922
Random digits for service time	84	10	74	53	17	79

Assume that the first customer arrives at time '0'. 9

2. *(a)* Write the differences between discrete and continuous systems and give suitable examples. 4

(b) With a neat flow diagram, explain the steps in simulation study. 10

UNIT—II

3. *(a)* Discuss the simulation software. 4

(b) A company uses six trucks to haul manganese from Kolar to industry. There are two loaders to load each truck. After loading, a truck moves to the weighing scale to be weighted. The queue discipline is FIFO. When it is weighted, a truck travels to the industry and returns to the loader queue. The distribution of loading time, weighing time and travel time are as follows :

Loading time	10	5	5	10	15	10	10
Weighing time	12	12	12	16	12	16	
Travel time	60	100	40	40	80		

Calculate the total busy time of both loaders, the scale, average loader and scale utilization. Assume five trucks are at the loader and one is at the scale, at time '0'. 10

4. *(a)* Explain the term used in discrete event simulation with an example : 6

(i) Event

(ii) Event notice

(iii) FEL

(iv) Delay

(v) Clock

(vi) System state

(b) Discuss the following : 8

(i) Discrete random variables

(ii) Continuous random variables

UNIT—III

5. *(a)* Discuss the characteristics of a queuing system. 6

(b) How do you measure the performance of a queuing system? 8

6. *(a)* Write a short note on policy for inventory simulation systems. 5

(b) Discuss in detail simulation of a single-server queuing model. 9

UNIT—IV

7. *(a)* Define random numbers. Using linear congruential method, calculate four 3-digit random numbers. 2+5=7

(b) What are the different applications of random numbers? 3

(c) Calculate five 4-digit random numbers using multiplicative congruential method. 4

8. Write short notes on the following : 7+7=14

(a) Tests for random numbers

(b) Random variate generation techniques

UNIT—V

9. *(a)* Describe the three-step approach to validation by Naylor and Finger. 10

(b) Write a short note on optimization via simulation. 4

10. *(a)* Explain the concept of point estimation and confidence interval estimation. 8

(b) Briefly explain output analysis for steady simulation. 6

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UG Odd Semester (CBCS) Exam., December—2019

COMPUTER SCIENCE

(5th Semester)

Course No. : MCSCC-501

(Internet Technologies)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. *(a)* Write short answer of the following : 1×5=5

(i) In which year VSNL has started internet service in India?

(ii) What is the attachment size limit of google drive?

(iii) What can be the maximum limit of 4-digit PIN if encrypted using SHA-1?

(iv) Define reCAPTCHA V3.

(v) What is RMN?

(b) Why is TCP not suitable for modern internet? 3

(c) How is domain name converted to IP address? 3

(d) What is packet sniffing? What is the format for data packets in Wireshark traffic analysis? 3

2. (a) Write short answer of the following : 1×5=5

(i) What is the range of hop limit in IPv6?

(ii) Give an example of SaaS.

(iii) Define access point.

(iv) What is the data speed of 5G internet?

(v) Who is the inventor of TCP/IP?

(b) Suppose an e-mail account is hacked by a perpetrator from African countries. What type of proceedings can be done according to the Indian IT Act? Discuss. 5

(c) Compare TCP and UDP. 2

(d) Write any points to secure transport layer. 2

UNIT—II

3. (a) Explain payment gateway with diagram. 4

(b) What is project management? Discuss the issues of a Web team management. 1+3=4

(c) "Multimedia and virtual reality is a part of modern Web sites." Explain. 3

(d) What are the features of X-lite? 3

4. (a) Write down the phases of a Web page development. 5

(b) What are the steps of online transaction? Write the technologies involved in the process. 4

(c) Discuss two conflict conditions in designing of a corporate Web site. 2

(d) Write a short note on WhatsApp Messenger. 3

UNIT—III

5. (a) How does a switch forward packets? 4

(b) What is static route? 2

(c) What is dynamic routing? Explain it using distance vector algorithm. 1+4=5

(d) Write down the functions of a gateway. 3

6. *(a)* What is port address translation? 3

(b) Compare static routing and dynamic routing. 4

(c) Draw the IPv6 packet header and explain each item. 5

(d) Define e-mail server. 2

UNIT—IV

7. *(a)* Write a JavaScript program to submit name, rollno, mobileno and address. Display a message when submitted. 8

(b) What is CSS? 2

(c) Explain JSP with an example. 4

8. *(a)* Write an HTML program to display the table given below :

Student Sl. No.	Mark A	Mark B	Mark C	Sum	Average

Assume data for Column 1–4 and Column 5 and 6 can be calculated using code. 8

(b) Write the use of XML. 2

(c) Compare ASP and JSP. 4

UNIT—V

9. Write short notes on the following : 5+5+4=14

(a) PhP-MySQL data connectivity

(b) Testing a Web page

(c) Malicious code

10. Write short notes on the following : 5+5+4=14

(a) CGI Applications

(b) Web 2.0

(c) Computer Worm

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UG Odd Semester (CBCS) Exam., December—2019

COMPUTER SCIENCE

(5th Semester)

Course No. : MCSCC–503

(Operating System and Architecture)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. (a) What do you mean by process? Explain the structure of process control block. 2+3=5

   (b) What is thread? 1

(c) Consider the following system of processes with CPU burst time given in millisecond :

Process	*Burst time*	*Priority*	*Arrival time*
P_1		3	0
P_2		1	1
P_3		4	2
P_4		3	3
P_5		2	4

Calculate the average waiting time and turnaround time for SJF (non-preemptive) and round-robin scheduling algorithm. 2×4=8

2. (a) What do you mean by context switch? Discuss the merits and demerits of context switch. 2+3=5

(b) What do you mean by snapping? 2

(c) For the given set of processes, calculate the waiting time and turn-around time applying SJF (preemptive) and priority (preemptive) scheduling algorithm. 3½×2=7

UNIT—II

3. (a) Distinguish between physical address space and logical address space. 3

(b) What is dynamic loading? 1

(c) What is Belady's Anomaly? Explain with suitable example. 1+3=4

(d) Consider the following page reference string to calculate the page fault number generated by LRU and round-robin page replacement algorithm with 3 frames : 2×3=6

1, 2, 1, 3, 1, 4, 2, 3, 4, 6, 5, 3, 6, 5

4. (a) What is fragmentation? Discuss the fragmentation with respect to paging and contiguous memory allocation. 1+3=4

(b) Explain the working principle of inverted page table structure with suitable diagram. 4

(c) Consider the following page reference string to calculate the page faults number generated by FIFO and optimal page replacement policy with 3 frames : 2×3=6

1, 2, 3, 3, 2, 4, 5, 1, 3, 1, 6, 3, 2, 1

UNIT—III

5. (a) What is interrupt handler? What is the importance of interrupt vector? 2+2=4

(b) What are the advantages and disadvantages of supporting memory-mapped I/O to device control registers? 4

(c) Given a hard disk of 1000 tracks (from 0 to 999) with track 0 being the innermost. The drive is currently serving a request at 113 no. track after completing a request at 99. Calculate the total distance required to travel by disk head to complete

501, 343, 734, 873, 102, 45, 15, 995

disk request for the disk scheduling algorithm

(i) SSTF, *(ii)* SCAN and *(iii)* C-LOOK. 6

6. *(a)* Define track, cylinder and block. 3

(b) Compare between I/O-mapped I/O and memory-mapped I/O. 3

(c) Suppose a hard disk of 500 tracks from 0 to 499 with track 0 being the innermost. Currently device serving request on 312 no. track while the drive completed a previous request on the track 369. Calculate the total distance required to travel by the disk head to complete

236, 331, 338, 426, 15, 1, 89, 118

disk request for the disk scheduling algorithm

(i) FCFS, *(ii)* SSTF, *(iii)* SCAN and *(iv)* C-SCAN. 8

UNIT—IV

7. *(a)* Discuss the basic structure of file system. 6

(b) What are the advantages of tree-like directory structure? 2

(c) Discuss the acyclic-directory structure with the help of suitable example. 6

8. *(a)* What are the basic file attributes? 2

(b) Discuss the linked-allocation method to allocate space. What are the benefits to use FAT (File Allocation Table) instead of pure linked allocation? 5+2=7

(c) What is the limitation of continguous space allocation? 2

(d) Explain the grouping technique to manage free space. 3

UNIT—V

9. *(a)* Explain the shared memory interprocess communication system with the help of producer-consumer problem. 7

(b) Discuss the necessary conditions of deadlock. 7

10. *(a)* Discuss the solution to critical section problem with reference to Peterson's approach. 8

(b) What do you mean by Dining Philosopher Problem? 3

(c) Discuss the resource-allocation graph. 3

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UG Odd Semester (CBCS) Exam., December—2019

COMPUTER SCIENCE

(5th Semester)

Course No. : MCSCC–504

(Programming in Java)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. Can polymorphism, inheritance and encapsulation work together? If yes, explain with a suitable Java Programming Code. 14

2. (a) Explain static variables, static statement and static class with a suitable Java Code. 6

(b) What do you mean by type casting? Explain with a suitable Java Code. 6

(c) State the differences between final and Final(). 2

UNIT—II

3. (a) Explain the following statements : 3+3=6

(i) Public static void main(string args)

(ii) System.out.println("Hello Java")

(b) Write a program to implement 2D matrix addition and multiplication. 8

4. (a) What do you mean by constructor? Write a Java Program to implement constructor overloading. 2+5=7

(b) Write a Java Program to implement method overloading and also explain the flow of execution of the code. 4+3=7

UNIT—III

5. (a) What do you mean by exception? How can you handle exceptions in Java Programming? 2+3=5

(b) What do you mean by try-catch exception handler block? Explain with a suitable Java Code. 2+5=7

(c) What is the role of finally keyword in Java exceptions? 2

6. (a) Write a Java Program to implement multiple thread creation. 5

(b) Explain the following : 5+4=9

(i) Throw

(ii) Throws

UNIT—IV

7. Write a Java Program to implement event handling on keyboard and mouse using an applet. 6+8=14

8. Write a Java Program to implement event handling on button, checkbox and radio button. 5+5+4=14

UNIT—V

9. (a) Explain card layout and Grid layout manager with a suitable code. 4+4=8

(b) Explain the following methods and constructors : 1+2+2+1=6

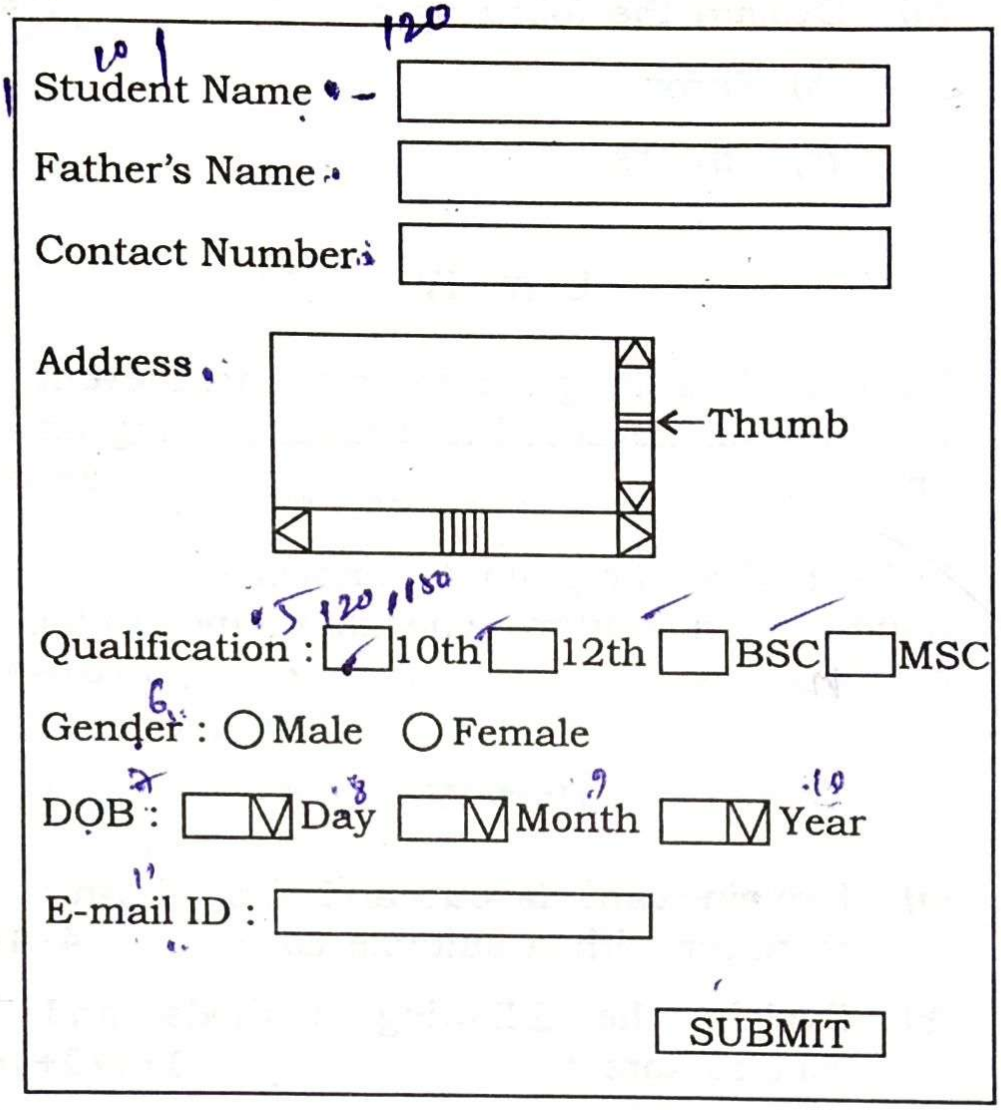
(i) get state ()

(ii) checkbox (strong str, checkbox Group ebgroup, Boolean on)

(iii) list (int numRow, Boolean multiple select)

(iv) get value()

10. Write a program to create a graphical user interface (GUI) as given below : 14



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