

Code No: xxxxxxxx

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

MODEL QUESTION PAPER-1

DATA STRUCTURES USING PYTHON

DEPARTMENT OF CSE (DS,CS,IoT)

Roll No									
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Time: 3 hours

Max. Marks: 70

Note:

Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

- 1.) Discuss briefly about OOP concepts?[14M][CO1]

(OR)

2. a)What is a Constructor? Explain different types of constructors in python?[7M][CO1]
b) How can we achieve code reusability in python? Explain with one example[7M][CO1]

SECTION – II

- 3.)Define data structure? Explain Set & Tuple methods?[CO2][14M]

(OR)

- 4).a) Discuss List and Dictionary, GeneratorComprehensions with examples?[CO2][10M]
b) Write any ten methods of String?[CO2][4M]

SECTION – III

- 5 a)Performthe Binary Search for the following list of elements with key as 62
98,34,37,68,69,62,18,29[C03][9M]

- b) How create an Arrays in Python using Numpymodule?[CO3][5M]

(OR)

- 6 a) Discuss briefly about Merge sort
b)Perform Quick Sort for the following list :12 ,-3,8,23,1,8,9,34

SECTION – IV

- 7 Discuss briefly about Queues and its applications?

(OR)

8. Explain briefly about Double Linked List?

SECTION – V

9. Discuss briefly about BFS and DFS with one example?

(OR)

- 10.Define AVL tree? Explain different types Rotations ?

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Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).

Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION – I

1.) Discuss briefly about OOP concepts?[14M][CO1]

(OR)

2. a)Write a Python Program to Implement Multiple Inheritance[7M][CO1]

b) Define Encapsulation? How to achieve Encapsulation in Python?[7M][CO1]

SECTION – II

3.)Define data structure? Explain briefly about Dictionaries and List?[CO2][14M]

(OR)

4).a) Discuss Set and Dictionary, GeneratorComprehensions with examples?[CO2][10M]

b) Write any ten methods of String?[CO2][4M]

SECTION – III

5 a)Performthe Binary Search for the following list of elements with key as 25

90,45,44,42,34,31,28,27,25[C03][9M]

b) How create an Arrays in Python ?[CO3][5M]

(OR)

6 a) Discuss briefly about Quick Sort

b)Perform Merge Sort for the following list :12 ,-3,8,23,1,8,9,34

SECTION – IV

7 Discuss briefly about Stacks and its applications?

(OR)

8. Explain briefly about Single Linked List?

SECTION – V

9. Discuss briefly about Tree Traversal Techniques with one example?

(OR)

10. Define Binary Search tree? Draw a BST for the following List:

10,12,43,7,56,34,67,87,98

Code No: XXXXXX

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**(Autonomous Institution – UGC, Govt. of India)****II B.Tech I Semester, Model Paper-I****Operating Systems****(CSE & IT)**

Roll No										
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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. What is an Operating system? Give its objectives. [7M]
b. Explain various networking utilities in LINUX with clear syntax, few options and example. [7M]

OR

- 2 Explain Evolution of operating systems. [14M]

SECTION-II

- 3 a. Explain different types of schedulers and scheduling queues [7M]
b. What is process? Explain different states of process. [7M]

OR

- 4 a. Explain the various types of system calls in detail [7M]
b. With an example script explain the differences between 'while' and 'until' statements. [7M]

SECTION-III

- 5 a. Write short notes on deadlock detection. [7M]
b. Explain different methods of recovery from deadlocks. [7M]

OR

- 6 What is a monitor? Explain how dining philosopher's problem is solved using monitors with example pseudo code. [14M]

SECTION-IV

- 7 a. Explain paging concept with neat diagram. [8M]
b. Compare the IPC functionality provided by message queues with shared memory. [6M]

OR

- 8 a. Explain LRU, FIFO page replacement algorithms for the following example reference 1,3,4,0,5,3,2,1,0,4,5,2,1,3,2,5 and frame size=3 and 4 and compare them. [8M]
b. Explain Paging model of Logical and Physical memory with a neat diagram [6M]

SECTION-V

- 9 a. What are different file access methods? [7M]
b. Discuss about free space management. [7M]

OR

- 10 a. Explain about disk structure. [7M]
b. What are Translation Look aside Buffer(TLB)? [7M]

Code No: XXXXXX

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**(Autonomous Institution – UGC, Govt. of India)****II B.Tech I Semester, Model Paper-II Operating****Systems****(CSE & IT)****Roll No****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. What are the services provided by operating systems? [7M]
b. What are shell responsibilities? [7M]

OR

- 2 Explain different operating system structures. [10M]
Draw the Linux File system [4M]

SECTION-II

- 3 a. Following is the snapshot of a CPU [10M]

Process	CPU Burst	Arrival Time
P1	75	0
P2	40	10
P3	25	10
P4	20	80
P5	45	85

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum) scheduling algorithms.

- b) Briefly explain about different types of shells in Linux [4M]

OR

- 4 State and Explain critical section problem. Give software based solution(Peterson's) for critical section problem [14M]

SECTION-III

- 5 a. What are the necessary conditions of deadlocks? [7M]
b. What are the different methods of handling deadlocks? [7M]

OR

- 6 Discuss readers/writers problem and give solution by using semaphores where readers have priority [14M]

SECTION-IV

- 7 a. Explain different Page table structures with neat diagram. [7M]
b. Illustrate about the IPC mechanisms [7M]

OR

- 8 a. Explain Demand paging. [6M]
b. Discuss about paging with segmentation. [8M]

SECTION-V

- 9 a. Explain different directory structures with examples. [10M]
b. Discuss about File System Structure [4M]

OR

10. a. Discuss about disk management. [7M]
b. Difference between free space management and swap space management. [7M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of
India)II B.Tech I Semester, Model
Paper-III Operating Systems
(CSE & IT)

Roll No									
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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. Explain different components of an operating system. [7M]
 b. Explain various process utilities, text processing utilities and network utilities available in Linux [7M]

OR

- 2 a. Differentiate between multiprogramming and timeshared operating systems. [7M]
 b. Discuss about Operating System Design and Implementation. [7M]

SECTION-II

- 3 a. Write a control structures of shell script? [7M]
 b. Write a shell script to list all of the directory files in a directory. [7M]

OR

- 4 Consider the following four processes, with the length of the CPU burst given in milliseconds. [14M]

Process	Arrival Time	Burst Time
P1	0	5
P2	1	6
P3	2	2
P4	3	8

Calculate the average waiting time and average turnaround time for round robin(time quanta=3), pre-emptive and non pre-emptive SJF.

SECTION-III

- 5 a. Write banker's algorithm for deadlock avoidance [6M]
 b. Consider the following snapshot of a system: [8M]

Processes	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	0 0 1 2	0 0 1 2	2 1 0 0
P1	2 0 0 0	2 7 5 0	
P2	0 0 3 4	6 6 5 6	
P3	2 3 4 5	4 3 5 6	
P4	0 3 3 2	0 6 5 2	

Answer the following questions using the banker's algorithm:

- a) What is the content of the matrix Need? b) Is the system in a safe state? Why?
 c) Is the system currently deadlocked? Why or why not? d) Which process, if any, or may become deadlocked if this whole request is granted immediately?

OR

6. a. State the requirements that a solution to the critical section problem must satisfy? [7M]
 b. Differentiate between semaphore and monitor. [7M]

Section -IV

- 7** a. Differentiate between logical and physical address.

[6M]

- b. Explain about Contiguous memory allocation

[8M]

OR

- 8** Discuss LRU approximation algorithms with examples.

[14M]

SECTION-V

- 9.** a. Explain the concept of file sharing? What are the criteria to be followed in systems which implement file sharing? **[7M]**

- b. Write short notes on a) Lseek b) stat c) ioctl. **[7M]**

OR

- 10.** Consider that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all pending requests for each of the following disk scheduling algorithms? **[14M]**

- A. FCFS
- B. SSTF
- C. SCAN
- D. C-SCAN

Code No: XXXXXX

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**(Autonomous Institution – UGC, Govt. of India)****II B.Tech I Semester, Model Paper-IV****Operating Systems****(CSE & IT)****Roll No****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. What are the functions provided by operating system services? [8M]
b. Explain about 10 Linux utilities [6M]

OR

- 2 a. Explain different types of system programs. [7M]
b. Discuss about real-time systems and distributed systems. [7M]

SECTION-II

- 3 a. Differentiate between pre-emptive and non pre-emptive scheduling with examples. [7M]
b. What are shell responsibilities? [7M]

OR

- 4 Explain different Problems of Synchronization. [14M]

SECTION-III

5. a. Consider the following snapshot of a system [8M]

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P1	0	0	1	3	0	0	1	2	1	5	2	0
P2	1	0	0	0	1	7	5	0				
P3	1	3	5	4	2	3	5	6				

Answer the following questions using the banker's algorithm:

a) What is the content of matrix "Need"? b) Is the system in a safe state? c) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?

- b. Write banker's for deadlock detection. [6M]

OR

- 6 a. Explain hardware based solutions for critical section problem [8M]
b. Differentiate between semaphore and monitor. [6M]

SECTION-IV

7. a. Explain about swapping. [6M]
b. Explain segmentation with neat diagram. [8M]

OR

OR

- 8 a. Explain optimal page replacement algorithm for the following example reference , 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 and frame size=3 and 4 and compare them. [8M]
- b. Write a note on thrashing. [6M]

SECTION-V

9. a. Explain different file allocation methods. [7M]
- b. Explain the following file concepts: [7M]
- 1)File attributes 2)File operations 3)File types 4)Internal file structure.

10. a. A hard disk has 63 sectors per tracks, 10 platters each with 2 recording surfaces and 1000 cylinders. The address of a sector is given as a triple <c, h, and s> where c is the cylinder number, h is the surface number and s is the sector number. Thus 0th sector is addressed as <0, 0, and 0>, the 1st sector is Addressed as <0, 0, and 1> and so on. Calculate the address of 1050th sector. [8M]
- b. Explain how disk caching can improve disk performance? [6M]

Code No: 135CV**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, October - 2020****OPERATING SYSTEMS****(Common to CE, EEE, ME, ECE)****Time: 2 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- - -

- 1.a) What are the different types of computing environments? Explain.
b) Discuss in detail about memory management. [7+8]
- 2.a) Explain about inter process communication.
b) Discuss about various types of schedulers. [7+8]
- 3.a) Discuss in detail about IA-32 paging.
b) How to manage virtual memory in windows? Explain. [7+8]
- 4.a) Discuss in detail about free space management.
b) Compare various disk scheduling algorithms. [7+8]
- 5.a) State and explain the four conditions that create deadlock.
b) Discuss in detail about deadlock avoidance. [7+8]
- 6.a) What is system call? Explain various types of system calls with example.
b) Explain in detail operating system design and implementation. [7+8]
- 7.a) Discuss in detail about real-time scheduling.
b) Differentiate between semaphore and monitor. [7+8]
- 8.a) Discuss in detail about optimal page replacement algorithm with example.
b) What is demand paging? Explain. [7+8]

---ooOoo---

Code No: 134BU

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2019

OPERATING SYSTEMS

(Common to CSE, IT)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) Define Operating systems. List the objectives of Operating System. [2]
- b) Illustrate about device controller and drivers. [3]
- c) What are the disadvantages of semaphore. [2]
- d) What is a critical section? Give example. [3]
- e) Compare internal and external fragmentation. [2]
- f) Explain first, best fit memory allocation techniques. [3]
- g) Define the terms seek time and rotational latency. [2]
- h) What are the various file accessing methods? [3]
- i) Explain safe, unsafe and deadlock state process. [2]
- j) What are the conditions used in Banker's algorithm? [3]

PART – B

(50 Marks)

- 2.a) Explain different categories of system calls with suitable example.
- b) What are the functionalities of Operating Systems? Explain in detail. [5+5]

OR

- 3.a) Explain features of Distributed Operating System.
- b) What are the various components of Operating System structure? And explain simple layered approach of Operating System in detail. [5+5]

- 4.a) Explain FIFO and Round Robin CPU scheduling algorithm. Why do we need?
- b) With a neat sketch explain process state diagram. [5+5]

OR

- 5.a) What are the criteria for evaluating the CPU scheduling algorithm?
- b) What is a process? Explain Process Control Block. [5+5]

- 6a) What is virtual memory? Discuss the benefits of virtual memory techniques.
- b) What are the disadvantages of single contiguous memory allocation? Explain. [5+5]

OR

- 7.a) Consider the following page reference string
1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6
Determine how many page faults would occur for Optimal page replacement algorithm.
Assume three frames are initially empty.
- b) Discuss the procedure for page fault in demand paging. [5+5]

- 8.a) Compare and Contrast Free space management and Swap space management.
b) Discuss the indexed file allocation method with an example. [5+5]

OR

- 9.a) Discuss various types of Disk storage attachments.
b) What are the objectives of file management system? Explain file system architecture. [5+5]

- 10.a) Explain deadlock detection algorithm with an example.
b) Explain the technique used to prevent the deadlock. [5+5]

OR

- 11.a) Explain about deadlock conditions and Banker's algorithm in detail.
b) Write the principles of protection? And explain the access matrix in detail. [5+5]

---ooOoo---

R16

Code No: 134BU

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech II Year II Semester Examinations, April - 2018****OPERATING SYSTEMS****(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) What are the different types of operating systems? [2]
- b) How parameters can be passed to system calls? [3]
- c) Define semaphores. [2]
- d) What is the role of dispatcher? [3]
- e) State the purpose of TLB. [2]
- f) Distinguish between logical address and physical address. [3]
- g) Define the following terms with respect to disk I/O – seek time and latency time. [2]
- h) Distinguish between shared and exclusive lock. [3]
- i) Define resource. List some resources that a process might need for its execution. [2]
- j) Describe role-based access control. [3]

PART-B**(50 Marks)**

- 2.a) Explain briefly system calls with examples.
 - b) Explain different operations performed by the operating system. [5+5]
- OR**
- 3.a) State and explain various types of computer systems.
 - b) Explain if you run the same program twice, what section would be shared in the memory. [5+5]
- 4.a) Describe dining-philosopher problem? Device an algorithm to solve the problem using semaphores?
 - b) Define process. How many different states a process has? Explain when a process changes the state with a state diagram? [5+5]

OR

- 5.a) Explain the readers writers problem and its solution using the concept of semaphores.
- b) Explain about Inter Process communication. [5+5]

AG AG AG AG AG AG AG A

6.a) Explain the following:

- i) Paging
- ii) Segmentation.

b) Explain why the "principle of locality" is crucial to the use of virtual memory? What is accomplished by page buffering? [5+5]

OR

7.a) Explain briefly the performance of demand paging with necessary examples.

b) Consider there are three page frames which are initially empty. If the page reference string is 1,2,3,4,2,1,5,3,2,4,6. The number of page faults using the optimal page replacement policy is? [5+5]

8.a) Explain the concept of file sharing. What are the criteria to be followed in systems which implement file sharing?

b) Compare the performance of write operations achieved by a RAID level 5 organization with that achieved by a RAID level 0 organizations? [5+5]

OR

9.a) Discuss the following terms

- i) File system mounting
- ii) Thrashing

b) What is the maximum file size supported by a file system with 16 direct blocks, single, double, triple indirection? The block size is 512 bytes. Disk block numbers can be stored in 4 bytes. [5+5]

10.a) Explain bankers algorithm for deadlock avoidance with an example.

b) Explain about domains of protection. [5+5]

OR

11.a) A system has 3 devices D1, D2 and D3 and 3 processes P1, P2 and P3. P1 is holding D1 and waiting for D3. P2 is holding D2 and waiting for D1. P3 is holding D3 and waiting for D2. Draw resource allocation graph and wait-for graph. Is the system in deadlock state or not? Explain.

b) State and explain the methods involved in recovery from deadlocks. [5+5]

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Code No: 115EH**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, March - 2017****OPERATING SYSTEMS****(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define system call. [2]
- b) Differentiate between multi programming and multi processing. [3]
- c) What is critical section problem? [2]
- d) How are processes managed in LINUX? [3]
- e) Differentiate between logical virtual and physical address. [2]
- f) Explain directory structure. [3]
- g) Give different RAID levels. [2]
- h) Discuss about swap space management. [3]
- i) Differentiate between unsafe state and dead lock state. [2]
- j) How access rights are revoked? [3]

PART - B**(50 Marks)**

- 2.a) Briefly explain typical functions of an Operating-System Kernel.
 - b) What resources are used when a thread is created? How do they differ from those used when a process is created? [5+5]
- OR**
- 3.a) What are the different types of operating systems? Explain them in detail.
 - b) What are the main characteristics of Real Time Operating System? [5+5]
4. Discuss readers/writers problem and give solution by using semaphores where readers have priority. [10]
- OR**
5. Construct the Gantt chart for a) Shortest job first b) Round Robin with $q=3$ c) Round robin with $q=4$ d) shortest remaining time first scheduling algorithms for the following. [10]

Process	P1	P2	P3	P4	P5
Arrival time	0	0	2	1	3
CPU Burst Time (in ms)	10	6	12	8	5

6. Explain how protection can be ensured using paging? [10]

OR

7.a) A process refers to 5 pages, A, B, C, D, and E in the order- A; B; C; D; A; B; E; A; B; C; D; E. If the page replacement algorithm is LRU, calculate the number of page faults with empty frames of size 4?

b) Explain the terms in Memory Partitioning with examples:
i) Fixed Partitioning ii) Dynamic partitioning. [5+5]

8. Suppose the head of a moving head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following disk scheduling algorithms?

(a) FCFS (b) SCAN (c) SSTF (d) C-SCAN [10]

OR

9.a) What is a Directory? Write short note on Directory implementation.

b) Explain about linked allocation method of a file. [5+5]

10. A system has 3 devices D1, D2 and D3 and 3 processes P1, P2, and P3. P1 is holding D1 and waiting for D3. P2 is holding D2 and waiting for D1. P3 is holding D3 and waiting for D2. Draw resource allocation graph and wait-for graph. Is the system in deadlock state or not? Explain. [10]

OR

11.a) Explain about capability based systems.

b) Discuss about revocation of access rights. [5+5]

---ooOoo---

Code No: R20A0510

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Model Question Paper – 1
Computer Networks

Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. (a) Compare and contrast a circuit-switched network and a packet-switched network [7]
(b) Explain OSI reference model and compare it with TCP/IP. ? [7]

(OR)

2. (a) Explain CSMA/CD protocol? [7]
(b) Explain selective repeat protocol with neat diagram [7]

SECTION – II

3. (a) What are the services provided to the Network Layer by Data Link Layer?
Explain. [7]
(b) Given 1101011011 data frame and generator polynomial $G(x) = x^4 + x + 1$. Derive the transmitted frame. [7]

(OR)

4. Describe the significance of error detection and error correction mechanisms in data link layer. [14]

SECTION – III

5. Explain distance vector routing algorithm and what is count to infinity problem providesolutions [14]

(OR)

- 3 (a) Discuss the IP addressing methods. [7]
(b) .Write short notes on ARP. [7]

SECTION – IV

7. Explain TCP connection management with neat diagram. [14]

(OR)

8. Explain the congestion control in TCP. [14]

SECTION – V

- 9 Describe how SMTP protocol is used in E-mail applications [14]

(OR)

10. (a) Explain the features of FTP and its operation. [10]
(b) Discuss the features of TELNET. What is the need for network virtual terminal? [4]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Model Question Paper – 2
Computer Networks

Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

1. (a) Explain different types of switching techniques along with their advantages and disadvantages. [7M]
b) Explain Guided media with neat diagrams. [7M]

(OR)

- 2 (a) Write short notes on TCP/IP model. [7M]
(b) Explain the OSI reference model. [7M]

SECTION – II

- 3 Compare various sliding window protocols of data link layer. [14M]

(OR)

- 4 What is the purpose of CSMA/CD? And also explain it. [14M]

SECTION – III

- 5 Explain the various congestion control mechanisms. [14M]

(OR)

- 6 (a) What is Classless Inter Domain Routing. [7M] (b) Explain The Address Resolution Protocol. [7M]

SECTION – IV

- 7 Explain Crash Recovery in Transport Layer. [14M]

(OR)

- 8 Explain the TCP segment header and TCP connection establishment. [14M]

SECTION – V

- 9 Describe how SMTP protocol used in Email application. [14M]

(OR)

- 10 (a) Explain (i) HTTP (ii) TELNET. [7M]
(b) Explain Domain Name System. [7M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Model Question Paper – 3
Computer Networks

Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

- 1 A) What are the different types of error detection methods? Explain the CRC error detection technique using generator polynomial x^4+x^3+1 and data 11100011 [7M]
- B) Explain about various guided transmission media in physical layer with a neat sketch. [7]

(OR)

- 2 A) Explain how are OSI and ISO related to each other. [5M]
- B) Suppose a computer sends a frame to another computer on a bus topology LAN., the physical destination address of the frame is corrupted during the transmission. what happens to the frame how can the sender be informed about the situation [9M]

SECTION – II

- 3 Write in detail about sliding window protocols. [14M]

(OR)

- 4 A) What are the functions of medium access control layers protocol? Explain. [7M]
- B) Compare and contrast a controlled access protocol with a channelizing protocol [7M]

SECTION – III

- 5 A) Derive the optimality principle with a suitable example [6M]
- (B) Explain various congestion control mechanisms in detail

[8
M]

(OR)

- 6 A) Describe Dijkstra shortest path algorithm. Also show working of Dijkstra algorithm with the help of an example. [7M]
- B) Describe the problem and solutions associated with distance vector routing. [7M]

SECTION – IV

- 7 A) Describe three way hand shaking protocol to establish the transport level connection. (B). Describe TCP header format [5M+9M]

(OR)

- 8 What happens when large packet wants to travel through network with smaller maximum packet size? Explain [14M]

SECTION – V

9 What is cryptography and explain RSA algorithm with an example [14M]

(OR)

10 A) What is electronic mail? Describe in brief about sending and receiving email.[9M].

B) Write short notes on [3+2=5M]

a) DNS

b) WWW

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Model Question Paper – 4
Computer Networks

Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

- 1 (a) Discuss about Internet standards [7M]
(b) Compare and contrast the OSI and TCP/IP reference models? [7M]

(OR)

- 2 (a) Explain about Go Back 'N' Sliding Window Protocol? [7M]
(b) Explain the algorithm for CRC method of error checking [7M]

SECTION – II

- 3 Explain about the following: [7+7]
a) ALOHA b) CSMA, CSMA/CD and CSMA/CA.

(OR)

- 4 (a) Explain fast Ethernet and gigabit Ethernet.
[7M]
(b) Illustrate the frame structure of IEEE 802.3 [7M]

SECTION – III

- 5 (a) What are the advantages of adaptive routing approach over non adaptive routing? [4M]
(b) Explain various congestion control mechanisms in detail. [10M]

(OR)

- 6 Describe Dijkstra shortest path algorithm. Also show working of Dijkstra algorithm with the help of an example. [14M]

SECTION – IV

- 7 (a). Illustrate the connection establishment and release in transport layer. [7M]
(b). Explain in detail about crash recovery. [7M]

(OR)

- 8 Explain the elements of a Transport protocol [14M]

SECTION – V

- 9 (a) Explain FTP protocol [7M]
(b) What are the services provided by transport layer to the upper layers [7M]

(OR)

- 10 What is DNS? What are the services provided by DNS and explain how it works [14M]

Code No: R20A0506

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Model Paper**Computer Organisation****SET-1**

Roll No									
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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

- 1.a) Explain the bus structure in detail with neat diagram.
b) What is meant by normalization in floating point representation? Illustrate with example? Summarize IEEE 754 standard floating point representation.
(OR)
2 Solve the step-by-step multiplication process using Booth algorithm with example.

SECTION – II

- 3 a) What is register transfer language? Briefly explain Three state buffers and show the basic symbols used in register transfer.
b) Design a one stage Arithmetic logic shift unit with a neat diagram
(OR)
4a) Elaborate the various kinds of computer registers along with block diagram and its representations.
b) Show computer instruction format and explain in detail.

SECTION – III

5. List out three types of CPU Organizations and Solve $X=(A+B)*(C+D)$ by using Three address, Two Address, One Address and Zero Address instructions.

(OR)

6. Distinguish between Hardwired Control Unit and Micro Programmed Control Unit.

SECTION – IV

7. What is cache memory? Discuss the different mapping techniques used in cache memories and their relative merits and demerits.

(OR)

8. (a) Explain about Associative memory with hardware organization.
(b) Compare and contrast between SRAM and DRAM.

SECTION – V

9. Draw the block diagram of a DMA controller and explain its functioning?

(OR)

10. (a) Define Pipeline processing with an example.
(b) Explain in detail about arithmetic and instruction pipeline.

Code No: R20A0506

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R20

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Model Paper

Computer Organisation

SET-2

Roll No									
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Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. (a) Explain Von Neumann architecture with suitable diagrams. Illustrate with diagrams the various components and its functioning (or) With a neat sketch, explain in detail about the functional units of computers.
(b) Contrast between Multiprocessors and Multicomputer.
(OR)
2. Apply restoring division algorithm to perform division with an example. Explain the sequence of steps using a flow chart.

SECTION – II

3. (a) What is the difference between a direct and an indirect address instruction?
(b) What is Micro operation? Briefly explain the arithmetic micro operations?
(OR)
4. (a) Explain the instruction cycle with the help of a flow chart. or
List and explain the steps involved in the execution of a complete instruction.
(b) Determine input output interrupt with an example.

SECTION – III

5. (a) Demonstrate briefly addressing modes with numerical examples.
(b) Write a short note on data transfer, data manipulation & program control instructions.
(OR)
6. Show diagrammatic representation and discuss Micro program example?

SECTION – IV

7. (a) Explain the internal organizations of RAM and ROM chips with a neat sketch.
(b) Write a short note on Write Policies.
(OR)
8. (a) Define Auxiliary Memory. Explain Magnetic disks and Magnetic Tapes with examples.
(b) Explain briefly about memory hierarchy.

SECTION – V

9. (a) Explain input-output processor in detail.
(b) Write short notes on SCII, Interrupts and I/O device Interface
(OR)
10. Define pipeline processing. Explain pipeline hazards in detail?

Code No: R20A0506**MALLA REDDY COLLEGE OF ENGINEERING &
TECHNOLOGY****(Autonomous Institution – UGC, Govt. of India)****II B.Tech I Semester Model Paper****Computer Organisation****SET-3**

Roll No									
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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a) Define Software. Demonstrate the performance of a computer.
b) Differentiate between fixed point and floating point representation
(OR)
2. Recall signed magnitude Addition and Subtraction? Explain with a neat diagram

SECTION-II

3. a) Construct a common bus system for register transfers using Multiplexers.
b) Define Micro operation. Discuss various logic and shift micro operations
(OR)
4. Summarize register reference and memory reference instructions.

SECTION-III

5. a) Explain the STACK Organization in detail with an example of Reverse Polish Notation.
b) Explain the characteristics of CISC and RISC.
(OR)
6. Illustrates Hardwired control unit and Micro Programmed control unit.

SECTION-IV

7. Explain different types of Replacement Algorithms.
(OR)
8. (a) Discuss various types of Semiconductor memory technologies.
(b) Explain Hit Ratio, Miss Ratio and Average Memory Access Time(AMAC).

SECTION-V

9. (a) What is Asynchronous data transfer? List out the methods to achieve it.
(b) Define Interrupt?Classifying the types of Interrupts?
(OR)
10. (a) With a neat diagram, explain the instruction pipeline processing in detail
(b) Summarize how pipelining improves the speed, throughput , and efficiency of a processor.

Most Important Questions Unitwise

UNIT I:

1. With a neat diagram, explain in detail the functional units of a computer.

or

Explain Von Neumann architecture with suitable diagram & the various components and its functioning.

2. a) Contrast between Multiprocessors and Multicomputer
b) Solve the step-by-step multiplication process using Booth algorithm when (-9) and (-13) are multiplied. Assume 5 bit registers to hold signed numbers and (-9) to be the multiplicand.
3. a) Define Data representation. Explain different data representations in detail.
b) Explain the bus structure in detail with neat diagram
4. Apply restoring division algorithm to perform division of 1000 and 0011. Explain the sequence of steps using a flow chart.
5. Recall signed magnitude Addition and Subtraction? Explain with a neat diagram.

UNIT II:

1. a) Define Micro operation. Discuss various logic and shift micro operations
b) Compare a direct and an indirect address instruction with instruction format?
2. a) What is register transfer language? What are the basic symbols used in register transfer.
b) Construct and explain the circuit diagram for Arithmetic micro operations.
3. a) Elaborate the various kinds of computer registers along with block diagram & its representations.
b) Design a one stage Arithmetic logic shift unit with a neat diagram
4. a) Explain various phases in instruction cycle with help of a flowchart.
b) Explain in detail about Input-Output Interrupt.
5. Summarize register reference and memory reference instructions.

UNIT III:

1. a) Explain all Addressing modes with numerical example.
b) Explain the characteristics of CISC and RISC
2. Distinguish between Hardwired Control Unit and Micro Programmed Control Unit.

or

Explain hardwired control unit and micro programmed control unit.

3. Explain data transfer, data manipulation and program control instructions.
4. Explain the STACK Organization in detail.
5. Explain the various Instruction formats w.r.t CPU Organizations in detail.

or

List out different types of CPU Organizations and Solve $X=(A+B)*(C+D)$ by using Three address, Two Address, One Address and Zero Address instructions.

UNIT IV:

1. a) Explain briefly about memory hierarchy with a neat diagram.
b) Write the differences between SRAM and DRAM.
2. Summarize the semiconductor memory technologies along with differences between RAM & ROM.
3. a) Explain briefly about Associative memory page table and page replacement.
b) Write a short note on Auxiliary memory devices.
4. Explain the internal organizations of RAM and ROM chips with a neat sketch.
5. Define Cache memory. Discuss the different mapping techniques used in cache memories and relative merits & demerits.

UNIT V:

1. Explain the DMA transfer technique with the block diagram.
or
Explain the various modes of transfers in detail.
2. a) Describe in detail about input-output-processor (IOP) organization.
b) Explain in detail about arithmetic and instruction pipeline.
3. What is Asynchronous data transfer? List out the methods to achieve it?
4. Define pipe line processing. Explain pipe line hazards in detail?
5. Write short notes on the following
 - a) SCSI Interface
 - b) Hit ratio
 - c) Speed & Throughput of Pipeline

II B. Tech II Semester Supplementary Examinations, November – 2020
COMPUTER ORGANIZATION
(Com. to CSE, ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Illustrate binary, octal and hexadecimal conversions. (3M)
- b) Draw the block diagram to transfer from R1 to R2. (4M)
- c) Explain the major phases of instruction cycle. (4M)
- d) Write about various decimal arithmetic micro operation symbols. (4M)
- e) Describe set associative mapping technique of cache memory. (3M)
- f) Explain the classification of multiprocessors. (4M)

PART -B

2. a) Explain operations on unsigned binary numbers and Perform the subtraction with the following unsigned binary numbers using 2's compliment (8M)
 - i) 11010-10000 iii) 11010-1101
 - ii) 100-110000 iv) 1010100-1010100
- b) Write and explain different types of computers based on the functions they perform. (8M)
3. a) Show to construction of bus system with four registers and explain various functions used to select registers by bus. (8M)
- b) Explain the input output configuration with interrupts. And explain the flowchart for interrupt cycle with an example. (8M)
4. a) Discuss the role of micro program sequencer in reading and executing micro instruction. (8M)
- b) Explain various instruction formats based on the number of address fields used in the instruction format with an example. (8M)
5. a) With flow chart explain the multiplication and division operations on two decimal Numbers P and Q. (8M)
- b) Describe the hardware implementation and hardware algorithm for addition and subtraction of signed magnitude data with an example. (8M)
6. a) What is auxiliary memory? Explain the various memory components used as auxiliary memory in computer systems. (8M)
- b) How to map a virtual address to physical address? Explain address mapping with pages and associative memory page table. (8M)
7. Explain the following with respect to asynchronous data transfer. (16M)
 - a) Strobe control b) Handshaking
 - c) Asynchronous serial transfer d) Asynchronous communication Interface.

II B. Tech II Semester Supplementary Examinations, April-2018
COMPUTER ORGANIZATION
 (Com. to CSE, ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) Convert the  $(246)_7$  to decimal (4M)
- b) List the phases of instruction cycle (4M)
- c) What are zero address instructions? Explain with the help of an example (4M)
- d) Explain about the array multiplier (4M)
- e) Explain the basic structure of cache memory (3M)
- f) Explain how to access I/O devices in a system (3M)

**PART -B**

2. a) What is bus? Draw the figure to show how functional units are interconnected using a bus and explain it (8M)
- b) Differentiate between fixed point and floating point representation (8M)
3. a) What is register transfer language? Explain the basic symbols used in register transfer. (8M)
- b) Explain the design of accumulator logic (8M)
4. a) Explain the basic computer instruction formats (8M)
- b) Explain the different types of addressing modes (8M)
5. a) Draw and explain the addition and subtraction of floating point numbers (8M)
- b) Explain the block diagram of BCD adder (8M)
6. a) Explain the block diagram of Associative memory (8M)
- b) Explain about the segmented page mapping (8M)
7. a) Distinguish between Isolated versus Memory Mapped I/O (8M)
- b) Explain about the Daisy chain arbitration (8M)

B.Tech III Year I Semester (R13) Supplementary Examinations June 2017

**COMPUTER ORGANIZATION & ARCHITECTURE**

(Common to ECE and EIE)

Time: 3 hours

Max. Marks: 70

**PART – A**

(Compulsory Question)

\*\*\*\*\*

- 1 Answer the following: (10 X 02 = 20 Marks)
- List out components of a CPU.
  - Why do you need interfacing in CO?
  - Write about decimal arithmetic unit.
  - State various algorithms available for multiplication and division operations.
  - Explain how shift micro operations.
  - What are the uses of register transfer language?
  - Discuss about possible modes of data transfer.
  - Mention the functions of associative memory.
  - What is parallel processing?
  - Describe the need for Inter Processor Communication.

**PART – B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 What is an instruction set? Explain how an instruction set architecture design works.

**OR**

- 3 (a) Describe about memory subsystem organization.  
(b) Write the differences between RISC and CISC.

**UNIT – II**

- 4 (a) Discuss about steps involved in instruction cycle with interrupt enabled.  
(b) State any two Floating point Arithmetic operations.

**OR**

- 5 (a) Explain the steps needed for storing a single word in memory.  
(b) Draw a flowchart for adding and subtracting two fixed point binary numbers where negative numbers are signed 1's complement presentation.

**UNIT – III**

- 6 (a) Write the procedure to mitigate number of bits in micro instructions.  
(b) Explain how control memory functions.

**OR**

- 7 What is a micro-operation of list and explain the four categories of the most common micro-operations?

**UNIT – IV**

- 8 Construct an associative memory page table with number of words equal to the number of blocks in the main memory.

**OR**

- 9 Explain the Strobe Control method of Asynchronous data transfer. What are the disadvantages of this method?

**UNIT – V**

- 10 What is pipelining? Name the two pipeline organizations. Explain about the arithmetic pipeline with the help of an example.

**OR**

- 11 Describe the need for Inter processor communication. Elaborate the synchronization concept used in Inter processor communication.

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**MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**(Autonomous Institution – UGC, Govt. of India)**  
**MODEL QUESTION PAPER-1**  
**Probability and Statistics**

**Time: 3 hours**

**Max Marks: 70**

**Note:** This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

**SECTION-I**

1a) A random variable has the following probability function

|      |   |   |    |    |    |                |                 |                    |
|------|---|---|----|----|----|----------------|-----------------|--------------------|
| x    | 0 | 1 | 2  | 3  | 4  | 5              | 6               | 7                  |
| P(x) | 0 | K | 2K | 2K | 3K | K <sup>2</sup> | 2K <sup>2</sup> | 7K <sup>2</sup> +K |

Find i) k ii)  $P(X \leq 6)$  iii)  $P(X > 6)$  iv) ) find 'c' if  $P(X \leq c) > 1/2$  [7M]

b) A sample of 4 items is selected at random from a box containing 12 items of which 5 are defective. Find the expected number E of defective items. [7M]

**OR**

2) For the following bivariate (two dimensional) probability distribution of X and Y find

i)  $P(X \leq 2, Y = 2)$  ii)  $F_X(2)$  iii)  $P(Y = 3)$  iv)  $P(X < 3, Y \leq 4)$  v)  $F_Y(3)$

|     |      |      |      |      |
|-----|------|------|------|------|
| X/Y | 1    | 2    | 3    | 4    |
| 1   | 0.1  | 0    | 0.2  | 0.1  |
| 2   | 0.05 | 0.12 | 0.08 | 0.01 |
| 3   | 0.1  | 0.05 | 0.1  | 0.09 |

[14M]

**SECTION-II**

3) The average number of phone calls /minute coming into a switch board between 2pm and 4pm is 2.5. Determine the probability the probability that one particular minute there will be i) 4 or fewer ii) more than 6 calls [14M]

**OR**

4) Suppose the weights of 800 male students are normally distributed with 28.8kg and SD of 2.06 kg. Find the number of students whose weights are

i) Between 28.4 kg and 30.4kg ii) more than 31.3 kg [14M]

**SECTION-III**

5a) Find the Karl-Pearson's coefficient of correlation for the paired data:

|                |     |     |     |     |    |    |    |    |    |     |
|----------------|-----|-----|-----|-----|----|----|----|----|----|-----|
| wages          | 100 | 101 | 102 | 100 | 99 | 97 | 98 | 96 | 95 | 102 |
| Cost of living | 98  | 99  | 99  | 95  | 92 | 95 | 94 | 90 | 91 | 97  |

[7M]

b) If  $\theta$  is the angle between two regression lines and S.D of Y is twice the S.D of X and  $r = 1.25$ , find  $\tan \theta$  . [7M]

**OR**

6) The heights of mothers and daughters are given in the following table. From the two tables of regression estimate average height of daughter when the height of the mother is 64.5 inches

|                    |    |    |    |    |    |    |    |    |
|--------------------|----|----|----|----|----|----|----|----|
| Height of mother   | 62 | 63 | 64 | 64 | 65 | 66 | 68 | 70 |
| Height of daughter | 64 | 65 | 61 | 69 | 67 | 68 | 71 | 65 |

[14M]

#### SECTION-IV

- 7a) A sample of size 64 and mean 70 were taken from a population whose standard deviation is 10. Construct 95% confidence interval for the mean. [7M]
- b) Write about (i) Null hypothesis (ii) Type I and Type II errors
- (iii) Alternative hypothesis. [7M]

#### OR

- 8a) In a study of automobile insurance a random sample of 80 body repair costs had a mean of Rs.472.36 and S.D of Rs.62.35. If  $\bar{x}$  is used as point estimate to the true average repair costs, with what confidence we can assert that the maximum error doesn't exceed Rs.10 [7M]
- b) Explain the procedure for Testing of Hypothesis. [7M]

#### SECTION-V

- 9) A survey of 320 families with 4 children each revealed the following distribution. [14M]

|                 |    |    |     |    |    |    |
|-----------------|----|----|-----|----|----|----|
| No# of boys     | 5  | 4  | 3   | 2  | 1  | 0  |
| No# of girls    | 0  | 1  | 2   | 3  | 4  | 5  |
| No# of families | 14 | 56 | 110 | 88 | 40 | 12 |

Is this result consistent with the hypothesis that male and female births are equally popular?

#### OR

- 10) The following are the average weekly losses of worker hours due to accidents in 10 industrial plants before and after a certain safety programme was put into operation:

|        |    |    |    |     |    |    |    |    |    |    |
|--------|----|----|----|-----|----|----|----|----|----|----|
| Before | 45 | 73 | 46 | 124 | 33 | 57 | 83 | 34 | 26 | 17 |
| After  | 36 | 60 | 44 | 119 | 35 | 51 | 77 | 29 | 24 | 11 |

Test whether the safety programme is effective in reducing the number of accidents at 5% LOS. [14M]

**MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**  
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**MODEL QUESTION PAPER-2**

**Probability and Statistics**

**TIME: 3hours**

**Max. Marks: 70**

**NOTE:** This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks

**SECTION-I**

- 1 a) If the p.d.f of a r.v  $x$  is given by  $f(x) = \begin{cases} k(1-x^2), & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$   
find i)  $k$  and ii) the cumulative distribution function of  $x$ . [7M]  
b) Write the definitions of (i) Random variable (ii) Discrete random variable (iii) Continuous random variable and (iv) Probability Distribution function. [7M]

**OR**

- 2) A random sample with replacement of size 2 is taken from  $S = \{1,2,3\}$ . Let the random variable  $X$  denote the sum of the two numbers taken: (i) Write the probability distribution of  $X$   
(ii) Find the mean  
(iii) Find the variance. [14M]

**SECTION-II**

3. A sales tax officer has reported that the average sales of the 500 businesses that he has to deal with during a year is Rs.36,000 with a standard deviation of Rs.10,000. Assuming that the sales in these businesses are normally distributed, find :  
i) The number of business as the sales of which are greater than Rs.40,000  
ii) The percentage of business sales of which are likely to range between Rs.30,000 and Rs.40,000 [14M]

**OR**

4. If 2% of light bulbs are defective, find  
(i) atleast one is defective  
(ii) exactly 7 are defective  
(iii)  $p(1 < x < 8)$  in a sample of 100  
(iv) atleast one is defective [14M]

**SECTION-III**

- 5 a) Fit a straight line  $Y = a_0 + a_1 X$  for the following data and estimate the value of  $Y$  when  $X = 25$

|   |   |    |    |    |    |
|---|---|----|----|----|----|
| X | 0 | 5  | 10 | 15 | 20 |
| Y | 7 | 11 | 16 | 20 | 26 |

[7M]

- b) Show that the maximum value of rank correlation coefficient is 1 [7M]

**OR**

- 6a) The marks obtained by 10 students in mathematics and statistics are given below. Find the rank correlation coefficient between the two subjects

|                      |    |    |    |    |    |    |    |    |    |    |
|----------------------|----|----|----|----|----|----|----|----|----|----|
| Marks in mathematics | 25 | 28 | 30 | 32 | 35 | 36 | 38 | 42 | 45 | 39 |
| Marks in Statistics  | 20 | 26 | 29 | 30 | 25 | 18 | 26 | 35 | 46 | 35 |

[7M]

- b) Find the Correlation coefficient if  $b_{xy} = 0.85$ ,  $b_{yx} = 0.89$ . [7M]

#### SECTION-IV

7.a) Samples of size 2 are taken from the population 1,2,3,4,5,6 with replacement. Find

(i) The mean of the population

(ii) Standard deviation of population

(iii) The mean of the sampling distribution of means

(iv) The standard deviation of the sampling distribution of means

[12M]

b) What is a statistic? Give an example

[2M]

**OR**

8. a) Write about null hypothesis and testing of null hypothesis.

[4M]

b) 20 people were attacked by a disease and only 18 survived. Will you reject the hypothesis that the survival rate if attacked by this disease is 85% in favour of the hypothesis that is more at 5% level. [10M]

#### SECTION-V

9. In an investigation on the machine performance the following results are obtained:

|           | No# of units inspected | No# of defectives |
|-----------|------------------------|-------------------|
| Machine 1 | 375                    | 17                |
| Machine 2 | 450                    | 22                |

Test whether there is any significant performance of two machines at 5%LOS

[14M]

**OR**

10. The following is the distribution of the daily number power failures reported in a city

|                       |   |    |    |    |    |    |    |    |   |   |
|-----------------------|---|----|----|----|----|----|----|----|---|---|
| No# of power failures | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8 | 9 |
| No# Of days           | 9 | 43 | 64 | 62 | 42 | 36 | 22 | 14 | 6 | 2 |

Test the goodness of fit of Poisson distribution at 5% LOS

[14M]

**MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**(Autonomous Institution – UGC, Govt. of India)**  
**MODEL QUESTION PAPER-3**  
**Probability and Statistics**

**Time: 3 hours**

**Max Marks: 70**

**Note:** This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

**SECTION-I**

1 a) If  $F(x)$  is the distribution function of  $x$  is given by  $F(X) = \begin{cases} 0 & \text{if } x \leq 1 \\ k(x-1)^4 & \text{if } 1 < x \leq 3 \\ 1 & \text{if } x > 3 \end{cases}$

Determine i)  $f(x)$  ii)  $k$  iii) mean

[10M]

b) Define (i) Probability mass function (ii) Probability density function .

[4M]

**OR**

2 a) Two random variables  $x$  and  $y$  have the joint density function

$$f_{xy}(x, y) = \begin{cases} x^2 + \frac{xy}{3}, & 0 \leq x \leq 1, 0 \leq y \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

Show that  $x$  and  $y$  are not independent . Find the conditional density function . check whether it is valid or not.

[7M]

b) The joint density function of  $w$  and  $z$  is given by

$$f_{wz}(wz) = \begin{cases} bwz & , 1 \leq w \leq 3 , 2 \leq z \leq 4 \\ 0 & , \text{otherwise} \end{cases}$$

Find  $b$  and marginal density function.

[7M]

**SECTION-II**

3a) Average number of accidents on any day on a national highway is 1.8 .Determine the probability that the number of accidents are i) atleast one ii) atleast one iii) exactly one.

[7M]

b) Fit a binomial distribution to the following data

[7M]

|   |    |     |     |     |     |    |
|---|----|-----|-----|-----|-----|----|
| x | 0  | 1   | 2   | 3   | 4   | 5  |
| f | 38 | 144 | 342 | 287 | 164 | 25 |

**OR**

4) In a normal distribution, 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution.

[14M]

**SECTION-III**

5) Obtain the rank correlation coefficient for the following data

[14M]

|   |    |    |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|----|----|
| X | 68 | 64 | 75 | 50 | 64 | 80 | 75 | 40 | 55 | 64 |
| Y | 62 | 58 | 68 | 44 | 81 | 60 | 68 | 48 | 50 | 70 |

**OR**

6) A panel of two judges P and Q graded seven dramatic performances by independently awarding marks as follows:

|             |    |    |    |    |    |    |    |
|-------------|----|----|----|----|----|----|----|
| Performance | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| Marks by P  | 46 | 42 | 44 | 40 | 43 | 41 | 45 |
| Marks by Q  | 40 | 38 | 36 | 35 | 39 | 37 | 41 |

The eight performance, which judge Q would not attend, was awarded 37 marks by judge P. If judge Q had also been present, how many marks would be expected to have been awarded by him to the eighth performance. [14M]

#### SECTION-IV

7a) A population consists of 5,10,14,18,13,24. Consider all possible samples of size 2 which can be drawn without replacement from the population. Find

i) The mean of the population

ii) Standard deviation of the population

iii) The mean of the sampling distribution of means

iv) Standard deviation of the sampling distribution of means [10M]

b) Write short notes on Type I and Type II error. [4M]

#### OR

8 a) A random sample of size 16 values from a normal population showed a mean of 53 and a sum of squares of deviations from the mean equals to 150. Can this sample be regarded as taken from the population having 56 as mean ? Obtain 95% confidence limits of the mean of the population. [10M]

b) Write step procedure for difference of means of two independent samples. [4M]

#### SECTION-V

9 a) Explain  $\chi^2$  test for independence of attributes. [4M]

b) The measurements of the output of two units have given the following results. Assuming that both Samples have been obtained from the normal distribution at 10% LOS. Test whether the two Populations have the same variance.

|         |      |      |      |      |      |
|---------|------|------|------|------|------|
| Unit -A | 14.1 | 10.1 | 14.7 | 13.7 | 14.0 |
| Unit -B | 14.0 | 14.5 | 13.7 | 12.7 | 14.1 |

[10M]

#### OR

10) The heights of 10 males of a given locality are found to be 70,67,62,68,61,68,70,64,64,66 inches .

Is it reasonable to believe that the average height is greater than 64 inches .Test at 5% LOS. [14M]





**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**PROBABILITY AND STATISTICS**  
**(COMMON FOR ALL DATASCIENCE,CYBER SECURITY,IOT)**

B. Tech II Year I Semester Examinations

(MODEL PAPER - I)

Time: 3 hours

Max Marks: 70

**Note:** Question paper Consists of 5 SECTIONS (One SECTION for each UNIT).  
 Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

| Sl No |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Course Outcomes | Blooms Taxonomy |      |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|------|----|----------------|-----------------|--------------------|---|---|------|---|---|----|----|----|----------------|-----------------|--------------------|-----|---|---|---|---|---|-----|---|-----|-----|---|------|------|------|------|---|-----|------|-----|------|-----|----|
| 1     | <p style="text-align: center;"><b>SECTION-I</b></p> <p>A random variable has the following probability function</p> <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>P(x)</td><td>0</td><td>K</td><td>2K</td><td>2K</td><td>3K</td><td>K<sup>2</sup></td><td>2K<sup>2</sup></td><td>7K<sup>2</sup>+K</td></tr></table> <p>Find i)k ii)P(X≤6) iii) P(X&gt;6) iv) ) find'c' if P(X≤c)&gt;1/2 [14]</p> <p style="text-align: center;"><b>(OR)</b></p> <p>For the following bivariate (two dimensional) probability distribution of X and Y find</p> <p>i) P (X≤ 2,Y=2) ii) <math>F_X(2)</math> iii) P(Y=3) iv) P(X&lt;3,Y≤ 4) v) <math>F_Y(3)</math> [14]</p> <table><tr><td>X/Y</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>1</td><td>0.1</td><td>0</td><td>0.2</td><td>0.1</td></tr><tr><td>2</td><td>0.05</td><td>0.12</td><td>0.08</td><td>0.01</td></tr><tr><td>3</td><td>0.1</td><td>0.05</td><td>0.1</td><td>0.09</td></tr></table> | x               | 0               | 1    | 2  | 3              | 4               | 5                  | 6 | 7 | P(x) | 0 | K | 2K | 2K | 3K | K <sup>2</sup> | 2K <sup>2</sup> | 7K <sup>2</sup> +K | X/Y | 1 | 2 | 3 | 4 | 1 | 0.1 | 0 | 0.2 | 0.1 | 2 | 0.05 | 0.12 | 0.08 | 0.01 | 3 | 0.1 | 0.05 | 0.1 | 0.09 | CO1 | L1 |
| x     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1               | 2               | 3    | 4  | 5              | 6               | 7                  |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| P(x)  | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | K               | 2K              | 2K   | 3K | K <sup>2</sup> | 2K <sup>2</sup> | 7K <sup>2</sup> +K |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| X/Y   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2               | 3               | 4    |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| 1     | 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0               | 0.2             | 0.1  |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| 2     | 0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.12            | 0.08            | 0.01 |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| 3     | 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.05            | 0.1             | 0.09 |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| 3     | <p style="text-align: center;"><b>SECTION – II</b></p> <p>The average number of phone calls /minute coming into a switch board between 2pm and 4pm is 2.5.Determine the probability the probability that one particular minute there will be i) 4 or fewer ii) more than 6 calls [14]</p> <p style="text-align: center;"><b>(OR)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CO2             | L5/L1           |      |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |
| 4     | <p>Suppose the weights of 800 male students are normally distributed with 28.8kg and SD of 2.06 kg. Find the number of students whose weights are</p> <p>i)Between 28.4 kg and 30.4kg</p> <p>ii) more than 31.3 kg</p> <p style="text-align: right;">[14]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                 |      |    |                |                 |                    |   |   |      |   |   |    |    |    |                |                 |                    |     |   |   |   |   |   |     |   |     |     |   |      |      |      |      |   |     |      |     |      |     |    |



|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |          |     |     |     |    |    |    |     |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|-----|-----|-----|----|----|----|-----|--------------------|-----|----------------|----|----|----|-----|----|----|----|----|----|----|-----|-------|
| 5                  | <p style="text-align: center;"><b>SECTION – III</b></p> <p>Find the Karl-Pearson’s coefficient of correlation for the paired data:</p> <table><tr><td>Wages</td><td>100</td><td>101</td><td>102</td><td>100</td><td>99</td><td>97</td><td>98</td><td>96</td><td>95</td><td>102</td></tr><tr><td>Cost of living</td><td>98</td><td>99</td><td>99</td><td>95</td><td>92</td><td>95</td><td>94</td><td>90</td><td>91</td><td>97</td></tr></table> <p>b) If <math>\theta</math> is the angle between two regression lines and S.D of Y is twice the S.D of X and<br/><math>r = 1.25</math>, find <math>\tan\theta</math>.<br/>[7+7]</p> <p style="text-align: center;">(OR)</p>         | Wages            | 100      | 101 | 102 | 100 | 99 | 97 | 98 | 96  | 95                 | 102 | Cost of living | 98 | 99 | 99 | 95  | 92 | 95 | 94 | 90 | 91 | 97 | CO3 | L1/L5 |
| Wages              | 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 101              | 102      | 100 | 99  | 97  | 98 | 96 | 95 | 102 |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| Cost of living     | 98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 99               | 99       | 95  | 92  | 95  | 94 | 90 | 91 | 97  |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| 6                  | <p>The heights of mothers and daughters are given in the following table. From the two tables of regression estimate average height of daughter when the height of the mother is 64.5 inches</p> <table><tr><td>Height of mother</td><td>62</td><td>63</td><td>64</td><td>64</td><td>65</td><td>66</td><td>68</td><td>70</td></tr><tr><td>Height of daughter</td><td>64</td><td>65</td><td>61</td><td>69</td><td>67</td><td>68</td><td>71</td><td>65</td></tr></table> <p style="text-align: right;">[14]</p>                                                                                                                                                                       | Height of mother | 62       | 63  | 64  | 64  | 65 | 66 | 68 | 70  | Height of daughter | 64  | 65             | 61 | 69 | 67 | 68  | 71 | 65 |    |    |    |    |     |       |
| Height of mother   | 62                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 63               | 64       | 64  | 65  | 66  | 68 | 70 |    |     |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| Height of daughter | 64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 65               | 61       | 69  | 67  | 68  | 71 | 65 |    |     |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| 7                  | <p style="text-align: center;"><b>SECTION – IV</b></p> <p>a) A sample of size 64 and mean 70 were taken from a population whose standard deviation is 10. Construct 95% confidence interval for the mean.<br/>b) Explain about<br/>(i) Null hypothesis<br/>(ii) Type I and Type II errors<br/>(iii) Alternative hypothesis.<br/>[7+7]</p> <p style="text-align: center;">(OR)</p>                                                                                                                                                                                                                                                                                                   | CO4              | L3/L2/L1 |     |     |     |    |    |    |     |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| 8                  | <p>In a study of automobile insurance a random sample of 80 body repair costs had a mean of Rs.472.36 and S.D of Rs.62.35. If <math>\bar{x}</math> is used as point estimate to the true average repair costs, with what confidence we can assert that the maximum error doesn’t exceed Rs.10<br/>b) Explain the procedure for Testing of Hypothesis. [7+7]</p>                                                                                                                                                                                                                                                                                                                     |                  |          |     |     |     |    |    |    |     |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| 9                  | <p style="text-align: center;"><b>SECTION – V</b></p> <p>The following are the average weekly losses of worker hours due to accidents in 10 industrial plants before and after a certain safety programme was put into operation:</p> <table><tr><td>Before</td><td>45</td><td>73</td><td>46</td><td>124</td><td>33</td><td>57</td><td>83</td><td>34</td><td>26</td><td>17</td></tr><tr><td>After</td><td>36</td><td>60</td><td>44</td><td>119</td><td>35</td><td>51</td><td>77</td><td>29</td><td>24</td><td>11</td></tr></table> <p>Test whether the safety programme is effective in reducing the number of accidents at 5%LOS. [14]</p> <p style="text-align: center;">(OR)</p> | Before           | 45       | 73  | 46  | 124 | 33 | 57 | 83 | 34  | 26                 | 17  | After          | 36 | 60 | 44 | 119 | 35 | 51 | 77 | 29 | 24 | 11 | CO5 | L4/L3 |
| Before             | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 73               | 46       | 124 | 33  | 57  | 83 | 34 | 26 | 17  |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| After              | 36                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 60               | 44       | 119 | 35  | 51  | 77 | 29 | 24 | 11  |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |
| 10                 | <p>A survey of 320 families with 4 children each revealed the following distribution.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |          |     |     |     |    |    |    |     |                    |     |                |    |    |    |     |    |    |    |    |    |    |     |       |



|  |                                                                                               |    |    |     |    |    |    |  |  |
|--|-----------------------------------------------------------------------------------------------|----|----|-----|----|----|----|--|--|
|  | Number of boys                                                                                | 5  | 4  | 3   | 2  | 1  | 0  |  |  |
|  | Number of girls                                                                               | 0  | 1  | 2   | 3  | 4  | 5  |  |  |
|  | Number of families                                                                            | 14 | 56 | 110 | 88 | 40 | 12 |  |  |
|  | Is the result consistent with the hypothesis that male and female births are equally popular? |    |    |     |    |    |    |  |  |





|         |   |   |   |   |  |  |  |  |  |  |
|---------|---|---|---|---|--|--|--|--|--|--|
| Roll No | 1 | 5 | N | 3 |  |  |  |  |  |  |
|---------|---|---|---|---|--|--|--|--|--|--|

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

## PART - A

(25 Marks)

- 1.
- 2 a) What are the measures of central tendency?
- 3 b) If A and B are both random events.  $P(\bar{A})=2/3$ ,  $P(A \cup B)=3/4$ ,  $P(A \cap B)=1/4$ . Find  $P(A \cap \bar{B})$ .
- 3 c) A typist makes on average 2 mistakes per page. What is the probability of a particular page having no errors on it?
- 2 d) State any two properties of two regression coefficients.
- 2 e) What is a standard error of an estimate?
- 3 f) Explain the terms: (i) Statistical Hypothesis (ii) Types of errors.
- 3 g) What are the applications of student t- distribution?
- 2 h) State the properties of Chi-square distribution.
- 3 i) What are the characteristics of a Queue?
- 2 j) Define Markov chain.

## PART - B

(50 marks)

SECTION-I

- 3 2. a) State and Prove addition law of Probability for two events.
- 7 b) A factory production line is manufacturing bolts using three machines, A, B and C. Of the total output, machine A is responsible for 25%, machine B for 35% and machine C for the rest. It is known from previous experience with the machines that 5% of the output from machine A is defective, 4% from machine B and 2% from machine C. A bolt is chosen at random from the production line and found to be defective. What is the probability that it came from, (i) machine A (ii) machine B (iii) machine C?

OR

- 5 3. a) A random variable X has the following probability distribution
 

|       |   |   |    |    |    |                |                 |                    |
|-------|---|---|----|----|----|----------------|-----------------|--------------------|
| X:    | 0 | 1 | 2  | 3  | 4  | 5              | 6               | 7                  |
| P(x): | 0 | k | 2k | 2k | 3k | k <sup>2</sup> | 2k <sup>2</sup> | 7k <sup>2</sup> +k |

 Find (i) constant k (ii)  $P(X \leq 6)$  (iii)  $P(X > 6)$  (iv) find 'c' if  $P(X \leq c) > 1/2$ .
- 5 b) X is a normally distributed with mean  $\mu = 30$  and SD  $\sigma = 4$ . Find (i)  $P(x < 40)$  (ii)  $P(30 < x < 35)$ .



## SECTION -II

- 6 4.a) Obtain the correlation coefficient to the following data.

|   |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|
| X | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
| Y | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

- 4 b) Explain the concept of repeated ranks.

OR

- 5 5. a) Explain the fitting procedure of line of regression Y on X.

- 5 b) For a set of 10 pairs of values of x and y, the regression line of x on y is  $x - 2y + 12 = 0$ ; mean and standard deviation of y being 8 and 2 respectively. Later it is known that a pair ( $x = 3, y = 8$ ) was wrongly recorded and the correct pair detected is ( $x = 8, y = 3$ ). Find the correct regression line of x on y.

## SECTION -III

- 3 6.a) Explain the procedure of a hypothesis testing problem.

- 7 b) The mean lifetime of 100 fluorescent light bulbs produced by a company is computed to be 1570 hours with a standard deviation of 120 hours. If  $\mu$  is the mean lifetime of all the bulbs produced by the company, test the hypothesis  $\mu = 1600$  hours against the alternative hypothesis  $\mu \neq 1600$  hours using a 5% level. (Table value=1.96)

OR

- 5 7. a) The means of two large samples of 1000 and 2000 items are 67.5 cms and 68.0 cms respectively. Can the samples be regarded as drawn from the population with standard deviation 2.5 cms. Test at 5% level of significance. (Table value=1.96)

- 5 b) In a sample of 1000 people in a state, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat eaters are equally popular in this state at 1% level of significance? (Table value=2.58)

## SECTION -IV

- 7 8. a) sample of 10 boys has the I.Q's 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. Test the mean I.Q of the students is 100 at 0.05 level of significance. (Table value=2.262)

- 3 b) Explain the test procedure for paired t-test for means

OR

- 10 9. A survey of 320 families with 5 children each, revealed the following distribution. Is the result consistent with the hypothesis that male and female births are equally probable at 0.01 significance level? (table value=12.832)

|                  |    |    |     |    |    |    |
|------------------|----|----|-----|----|----|----|
| No. of Boys:     | 5  | 4  | 3   | 2  | 1  | 0  |
| No. of Girls:    | 0  | 1  | 2   | 3  | 4  | 5  |
| No. of families: | 14 | 56 | 110 | 88 | 40 | 12 |

## SECTION -V

- 4 10 a) What are the measures of queuing model  $(M/M/1):(\infty/FCFS)$

- 6 b) In railway marshalling yard goods trains arrive at a rate of 30 trains per day. Assuming that the inter arrival time follows an exponential distribution and service time distribution is also exponential with an average 36 minutes. Calculate: (i) The mean queue size (ii) The probability that the queue length exceeds 10.

OR

- 10 11. A gambler has Rs.2. He bets Rs.1 at a time and wins Rs.1 with probability 0.5. He stops playing if he loses Rs.2 or wins Rs.4.

- i) What is the transition probability matrix of the related Markov chain?  
ii) What is the probability that he has lost his money at the end of 5 plays?



**R15**

Code No: R15A0024

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Regular/Supplementary Examinations, November 2017

Probability and Statistics

(CSE, IT)

|         |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|

Time: 3 hours

Max. Marks: 75

**Note:** This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

**PART – A**

(25 Marks)

1. (a) What are the measures of Central tendency?
- (b) A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that among the balls drawn there is at least one ball of each color.
- (c) What is principle of least square?
- (d) In a record of an analysis of correlation data, the following results are readable:  
Variance of  $X = 9$ ; Regression equations:  $8X - 10Y + 66 = 0$  and  $40X - 18Y = 214$ . Find the mean values of  $X$  and  $Y$ .
- (e) Define sampling distribution.
- (f) What are the types of errors in testing of hypothesis?
- (g) State applications of student t- distribution.
- (h) Write all the properties of Chi-square distribution.
- (i) What are the characteristics of a queue in queuing system?
- (j) Write a short note on stochastic process.

**PART – B**

(50 Marks)

**SECTION – I**

2. a) State and prove addition law of probability for two events
- b) In a bolt factory machines  $A_1$ ,  $A_2$ ,  $A_3$  manufacture respectively 25%, 35% and 40% of the total output. Of these 5, 4, and 2 percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine  $A_2$ .

(OR)

3. Find the mean and variance of binomial distribution.



## SECTION – II

4. Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y):

X: 65 66 67 67 68 69 70 72  
Y: 67 68 65 68 72 72 69 71

(OR)

5. Fit a linear regression equation of Y on X to the following data:

X: 5 8 7 6 4  
Y: 3 4 5 2 1

## SECTION – III

6. A sample of 900 members has a mean 3.4 cms and s.d 2.61 cms. Is the sample drawn from a large population of mean 3.25 cms and s.d 2.61 cms? 5% level.

(OR)

7. In a sample of 1000 people in a state, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat eaters are equally popular in this state at 1% level of significance?

## SECTION – IV

8. A sample of 10 boys has the I.Q's 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. Test the mean I.Q of the students is 100 at 0.05 level of significance.

(OR)

9. A survey of 320 families with 5 children each, revealed the following distribution. Is the result consistent with the hypothesis that male and female births are equally probable at 0.01 significance level?

|                  |   |    |   |     |    |    |    |
|------------------|---|----|---|-----|----|----|----|
| No. of Boys      | : | 5  | 4 | 3   | 2  | 1  | 0  |
| No. of Girls     | : | 0  | 1 | 2   | 3  | 4  | 5  |
| No. of families: |   | 14 | 6 | 110 | 88 | 40 | 12 |

## SECTION – V

10. A television repairman finds that the time spent on his jobs an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they came in, and if the arrival of sets follows a poisson distribution approximately with an average rate of 10 per 8-hour daily, what is the repairman's expected idle time each day? How many jobs are a head of the average set just brought in?

(OR)

11. Explain Markov chain by an example.

\*\*\*\*\*



Code No: R15A0024

R15

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

**II B.Tech I Semester supplementary Examinations, May 2017**

**Probability and Statistics**

(CSE)

|         |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|

**Time: 3 hours**

**Max. Marks: 75**

**Note:** This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

**PART - A**

**(25 Marks)**

1. a Define classical definition of probability.

b. A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that among the balls drawn there is at least one ball of each color.

c. What is angle between two regressions lines ?

d. Explain the term Regression.

e. Define sampling distribution.

f. Explain (1) Type-I-error (2) Type-II-error.

g. Write a short note on Chi-square test.

h. Obtain 95% confidence interval for mean with  $n = 16$ ,  $400$ ,  $\bar{x} = 3.42$ ,  $s = 0.68$ .  
(table value=2.947)

i. What is a waiting line?

j. Define Markov processes.

**PART - B**

**(50 marks)**

**SECTION-I**

2. a) Two persons A and B appeared for an interview for a job. The probability of selection of A is  $1/3$  and that of B is  $1/2$ . Find the probability that (i) both of them will be selected (ii) only one of them will be selected (iii) none of them will be selected

b) State Baye's theorem.

OR

3. a) The diameter of an electric cable assumed to be a continuous r.v with the p.d.f  $f(x) = 6x(1 - x)$ ,  $0 \leq x \leq 1$ . Check that  $f(x)$  is p.d.f, and find b such that  $P(x < b) = P(x > b)$ .

b) Components are packed in boxes of 20. The probability of a component being defective is 0.1. What is the probability of a box containing 2 defective components?



### SECTION -II

- 4.a) Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y):

X : 65 66 67 67 68 69 70 72  
Y : 67 68 65 68 72 72 69 71

- b) In a record of an analysis of correlation data, the following results are readable:  
✓ variance of X = 9; Regression equations:  $8X - 10Y + 66 = 0$  and  $40X - 18Y = 214$ .  
Find (i) the mean values of X and Y  
(ii) The correlation coefficient between X and Y and  
(iii) The standard deviation of Y

OR

5. The following are midterm and final examination test scores for 10 students from a calculus class, where x denotes the midterm score and y denotes the final score for each student.

X: 68 87 75 91 82 77 86 82 75 79

Y: 74 79 80 93 88 79 97 95 89 92

Calculate the least-squares regression lines for these data.

### SECTION -III

6. a) Discuss the test procedure for testing single mean of the population when size of the sample is large.  
b) The mean lifetime of 100 fluorescent light bulbs produced by a company is computed to be 1570 hours with a standard deviation of 120 hours. If  $\mu$  is the mean lifetime of all the bulbs produced by the company, test the hypothesis  $\mu = 1600$  hours against the alternative hypothesis  $\mu \neq 1600$  hours using a 5% level. (Table value = 1.96)

OR

7. a) Test the significance of the difference between the means of the samples from the following data:

|                    | Sample A | Sample B               |
|--------------------|----------|------------------------|
| Size of sample     | 100      | 150                    |
| Mean               | 50       | 51                     |
| Standard deviation | 4        | 5 (Table value = 1.96) |

- b) Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same at 5% level.



#### SECTION -IV

8. a) sample of 10 boys has the I.Q's 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. Test the mean I.Q of the students is 100 at 0.05 level of significance. (Table value = 2.262)

b) Explain the test procedure for t-test for difference of population means.

OR

9. Fit a Poisson distribution to the following data and test the goodness of fit at 0.05 levels:

|                   |     |    |    |    |    |   |   |
|-------------------|-----|----|----|----|----|---|---|
| No. of accidents: | 0   | 1  | 2  | 3  | 4  | 5 | 6 |
| No. of days :     | 150 | 65 | 45 | 34 | 10 | 6 | 2 |

#### SECTION -V

10 a) What are the characteristics of queuing model  $M/M/1:\infty/FCFS$

b) A single server queuing system with Poisson input, exponential service times. Suppose the mean arrival rate is 3 calling units per hour, the expected service time is 0.25 hours and the maximum permissible number calling units in the system is two. Calculate the expected number in the system.

OR

11. a) Define Markov chain. Give examples.

b) Explain about limiting distribution of a Markov chain.

\* \* \* \* \*



Code No: R15A0024

R15

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

**II B. Tech I Semester Supplementary Examinations, May 2018**

**Probability and Statics**

**(CSE & IT)**

|         |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|

**Time: 3 hours**

**Max. Marks: 75**

**Note:** This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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**PART – A**

**(25 Marks)**

1. (a) Define Random variable? (2M)
- (b) A problem in statistics is given to three students A, B and C, whose chances of solving it are respectively  $1/2$ ,  $1/3$  and  $1/4$ . What is the probability that the problem will be solved? (3M)
- (c) What are the normal equations to fit a straight line equation? (2M)
- (d) From the following data, compute the coefficient of correlation between X and Y. (3M)

|                                                             | X Series | Y Series |
|-------------------------------------------------------------|----------|----------|
| No. of Items                                                | 15       | 15       |
| Arithmetic Mean                                             | 25       | 18       |
| Sum of squares of deviations from mean                      | 136      | 138      |
| Sum of products of deviations of X and Y from their means : | 122      |          |

- (e) Define standard error of an estimate. (2M)
- (f) Explain types of errors in tests of significance? (3M)
- (g) State applications of Chi-square distribution. (2M)
- (h) Write all the properties of t- distribution. (3M)
- (i) What is a queue in queuing system? (2M)
- (j) Write a short note on Markov chain. (3M)

**PART – B**

**(50 Marks)**

**SECTION – I**

2. a) State Baye's theorem. (3M)
- b). A random variable X has the following probability function. (7M)

|      |   |   |    |    |    |                |                 |                    |
|------|---|---|----|----|----|----------------|-----------------|--------------------|
| X    | 0 | 1 | 2  | 3  | 4  | 5              | 6               | 7                  |
| P(X) | 0 | k | 2k | 2k | 3k | k <sup>2</sup> | 2k <sup>2</sup> | 7k <sup>2</sup> +k |

Find (i) k (ii) E(x)

**(OR)**

3. X is a normally distributed with mean  $\mu = 30$  and SD  $\sigma = 4$ . Find a)  $P(x < 40)$  b)  $P(x > 21)$
- c)  $P(30 < x < 35)$ . (10M)



## SECTION – II

4. Find the spearman rank correlation coefficient to the following data: (10M)

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| X: | 11 | 12 | 43 | 84 | 15 |
| Y: | 8  | 15 | 30 | 60 | 12 |

(OR)

5. Estimate the production for the year 2008, by fitting regression line to the following data: (10M)

|             |      |      |      |      |      |
|-------------|------|------|------|------|------|
| Year:       | 2003 | 2004 | 2005 | 2006 | 2007 |
| Production: | 5    | 8    | 14   | 12   | 13   |

(in thousand Qt).

## SECTION – III

6. The means of two large samples of 1000 and 2000 items are 67.5 cms and 68.0cms respectively. Can the samples be regarded as drawn from the population with standard deviation 2.5 cms. Test at 5% level of significance.. (10M)
- (OR)
7. A random sample of 500 apples was taken from a large consignment and 60 were found bad. Obtain the 98% confidence limits for the percentage of bad apples in the consignment. (given  $z = 2.33$ ) (10M)

## SECTION – IV

8. Fit a Poisson distribution to the following data and test the goodness of fit: (10M)

|                    |     |    |    |    |    |   |   |
|--------------------|-----|----|----|----|----|---|---|
| No. of accidents : | 0   | 1  | 2  | 3  | 4  | 5 | 6 |
| No. of days :      | 150 | 65 | 45 | 34 | 10 | 6 | 2 |

(OR)

9. A sample of 10 boys has the I.Q's 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. Test the mean I.Q of the students is 100 at 0.05 level of significance. (10M)

## SECTION – V

10. What are the characteristics of a queuing system explain them in detail? (10M)

(OR)

11. Explain stochastic processes in detail. (10M)

\*\*\*\*\*



(Autonomous Institution – UGC, Govt. of India)  
II B. Tech I Semester Regular Examinations, November 2018  
Probability and Statistics  
(CSE & IT)

[illegible]

Max. Marks: 70

## SECTION-I

- b) Four coins are tossed 160 times. The number of times  $X$  heads occurs is given below [7M]

|             |   |    |    |    |   |
|-------------|---|----|----|----|---|
| X           | 0 | 1  | 2  | 3  | 4 |
| No of times | 8 | 34 | 69 | 43 | 6 |

OR

- |        |     |     |     |
|--------|-----|-----|-----|
| X      | -3  | 6   | 9   |
| P(X=x) | 1/6 | 1/2 | 1/3 |

b) A r.v.  $X$  is a normally distributed with mean 30 and SD 5. Find the probabilities that (i)  $26 \leq X \leq 40$  (ii)  $X \geq 45$

## SECTION-II

- |    |   |   |   |   |   |
|----|---|---|---|---|---|
| X: | 5 | 8 | 7 | 6 | 4 |
| Y: | 3 | 4 | 5 | 2 | 1 |

- |    |    |    |    |    |    |
|----|----|----|----|----|----|
| X: | 11 | 12 | 43 | 84 | 15 |
| Y: | 8  | 15 | 30 | 60 | 12 |

OR

- Regression equations:  $8X - 10Y + 100 = 0$  and  $40X - 18Y = 214$ . Find (i) the mean values of X and Y (ii) The correlation coefficient between X and Y and (iii) The standard deviation of Y
- b) Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y): [7M]

- b) Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y): [7M]

|     |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|
| X : | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
| Y : | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

### SECTION-III

- 5 a) Explain in brief one tailed and two tailed tests [4M]  
b) A random sample of 400 students is found to have a mean height of 171.38 cms. Can it be reasonably regarded as a sample from a large population with mean height 171.17 cms. and standard deviation 3.30 cms. (Test at 5% level of significance) [5M]  
c) A random sample of 500 apples was taken from a large consignment and 60 were found



bad. Obtain the 98% confidence limits for the percentage of bad apples in the consignment (given  $z = 2.33$ )

OR

- 6 Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same at 5% level. [5M] [14M]

#### SECTION-IV

- 7 A sample of 10 boys has the I.Q's 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. Test the mean I.Q of the students is 100 at 0.05 level of significance. [14M]

OR

- 8 Fit a Poisson distribution to the following data and test the goodness of fit: [14M]
- |                   |     |    |    |    |    |   |   |
|-------------------|-----|----|----|----|----|---|---|
| No. of accidents: | 0   | 1  | 2  | 3  | 4  | 5 | 6 |
| No. of days :     | 150 | 65 | 45 | 34 | 10 | 6 | 2 |

#### SECTION-V

- 9 What are the measures of queuing model  $M/M/1:N/FCFS$ . [14M]
- b A self service canteen employs one cashier at its counter. 8 customers arrive per every 10 minutes on an average. The cashier can serve on average one per minute. Assuming that arrivals are Poisson and the service time distribution is exponential. Determine
- The average number of customers in the system
  - The average queue length
  - The average time a customer spends in the system
  - Average waiting time of each customer.

OR

- 10 a) Define Markov chain. Give examples. [14M]
- b) Explain about limiting distribution of a Markov chain

\*\*\*\*\*



Code No: R15A0024

R15

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

**II B.Tech I Semester supplementary Examinations, May 2019**

**Probability and Statistics**

**(CSE & IT)**

|         |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|

**Time: 3 hours**

**Max. Marks: 75**

**Note:** This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

\*\*\*\*

**PART-A (25 Marks)**

- 1). a The mean and variance of binomial distribution are 4 and  $4/3$  respectively . [2M]  
Find  $P(X > 1)$ .
- b Find the constant k so that the function  $f(x)$  defined by  $f(x) = \begin{cases} \frac{1}{k} & a \leq x \leq b \\ 0 & \text{elsewhere} \end{cases}$  [3M]  
is a Density function.
- c Explain the Scatter diagram. [2M]
- d Give an example of uncorrelated variables which are not independent. [3M]
- e Write a short note on errors in sampling distribution. [2M]
- f Write the standard error of the statistic for difference of two samples proportions. [3M]
- g Write properties of chi-square distribution. [2M]
- h Write applications of t-distribution. [3M]
- i Write the types of queue discipline. [2M]
- j If  $p = \frac{1}{2}$ ,  $q = \frac{1}{2}$ ,  $z = 1$ ,  $a = 500$ , then find  $d_z$ . [3M]

**PART-B (50 MARKS)**

**SECTION-I**

- 2 A problem in statistics is given to the three students A,B,C, whose chances of solving it are,  $1/2$ ,  $3/4$ , and  $1/4$  respectively. What is the probability that the problem is solved? [10M]  
OR
- 3 Fit a binomial distribution to the following data [10M]

|   |    |     |     |     |     |    |
|---|----|-----|-----|-----|-----|----|
| x | 0  | 1   | 2   | 3   | 4   | 5  |
| f | 38 | 144 | 342 | 287 | 164 | 25 |

**SECTION-II**

- 4 Calculate the correlation coefficient for the following heights (in inches) of fathers (x) and their sons(y): [10M]

|   |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|
| X | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
| Y | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

OR

- 5 The two regression lines are  $7x - 16y + 9 = 0$  and  $5y - 4x - 3 = 0$ . Find the coefficient of correlation and the means of x and y. [10M]



SECTION-III

- 6 The mean height of students in a college is 155 cms. and standard deviation is 15. [10M]  
What is the probability that the mean height of 36 students is less than 157 cms.

OR

- 7 In a sample of 500 from a village in Telangana, 280 are found to be rice eaters and the [10M]  
rest wheat eaters. Can we assume that both articles are equally popular?

SECTION-IV

- 8 A coin was tossed 400 times and returned heads 216 times. Test the hypothesis that [10M]  
the coin is unbiased. Use a 0.05 Level of significance.

OR

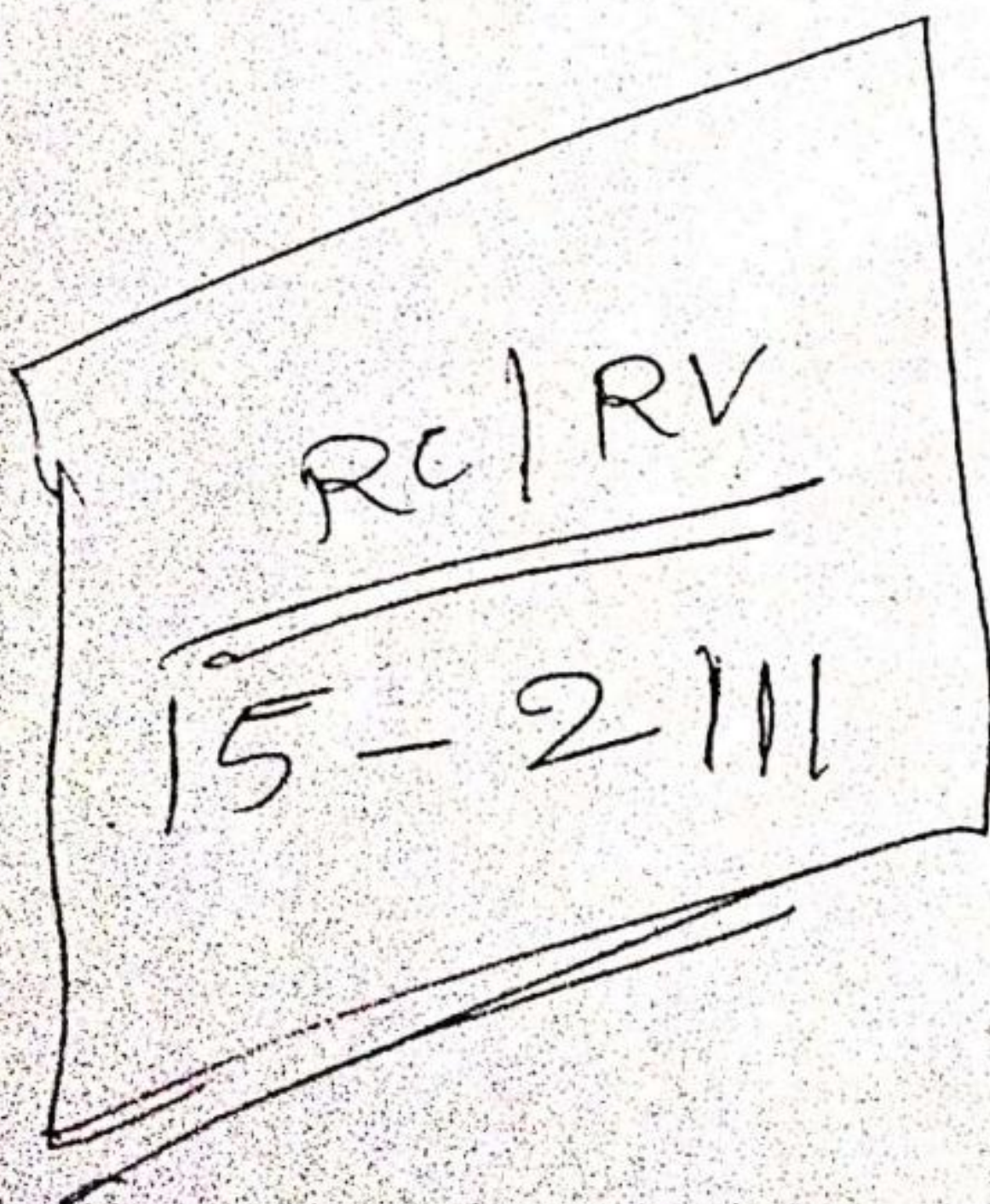
- 9 A random sample of 10 bags of pesticide are taken whose weights are [10M]  
50,49,52,44,45,48,46,45,49,45 (in kgs). Test whether the average packing can be taken  
to be 50 kgs.

SECTION-V

- 10 A fast food restaurant has one drive in window . It is estimated that cars arrive [10M]  
according to a Poisson distribution at the rate of 2 every 5 minutes and that there is  
enough space to accommodate a line of 10 cars. Other arriving cars can wait outside  
this space ,if necessary . It takes 15 minutes on the average to fill an order, but the  
service time actually varies according to an exponential distribution . Determine the  
following  
a ) The probability that the facility is idle  
b) The expected number of customers waiting to be served

OR

- 11 Define Stochastic Matrix. Test the matrix  $\begin{bmatrix} \frac{1}{3} & \frac{2}{3} & \frac{4}{3} \\ \frac{1}{2} & 1 & \frac{1}{2} \end{bmatrix}$  stochastic or not. [10M]  
\*\*\*\*\*





Code No: R18A0024

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

**II B.Tech I Semester Regular Examinations, November 2019****Probability and Statistics****(CSE & IT)**

|         |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|

**Time: 3 hours****Max. Marks: 70**

**Note:** This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing **ONE** Question from each **SECTION** and each Question carries 14 marks.

\*\*\*

**SECTION-I**

- 1 a) Define PMF, PDF and distribution function of random variables. [4M]  
 b) The diameter of an electric cable assumed to be a continuous r.v with the p.d.f [10M]  
 $f(x) = Kx(1-x)$ ,  $0 \leq x \leq 1$ . Check that  $f(x)$  is p.d.f, and find (i) constant  $K$ , (ii)  $b$  such that  $P(x < b) = P(x > b)$

OR

- 2 A random variable  $X$  has the following probability function [14M]

|        |   |     |      |      |      |       |        |            |
|--------|---|-----|------|------|------|-------|--------|------------|
| $x$    | 0 | 1   | 2    | 3    | 4    | 5     | 6      | 7          |
| $p(x)$ | 0 | $K$ | $2K$ | $2K$ | $3K$ | $K^2$ | $2K^2$ | $7K^2 + K$ |

(i) Determine  $K$  (ii) Mean (iii) Variance.**SECTION-II**

- 3 a) Define binomial distribution. obtain mean and variance of the distribution. [6M]  
 b) Components are packed in boxes of 20. The probability of a component being [8M]  
 defective is 0.1. What is the probability of a box containing 2 defective components?

OR

- 4 Suppose the weights of 800 male students are normally distributed with 28.8kg and [14M]  
 SD of 2.06 kg. Find the number of students whose weights are  
 i) Between 28.4 kg and 30.4kg ii) more than 31.3 kg

**SECTION-III**

- 5 Calculate the correlation coefficient for the following heights (in inches) of fathers [14M]  
 (X) and their sons (Y):

X : 65 66 67 67 68 69 70 72  
 Y : 67 68 65 68 72 72 69 71

OR

- 6 The following are midterm and final examination test scores for 10 students from [14M]  
 a class of a college, where  $x$  denotes the midterm score and  $y$  denotes the final score for each student.

X: 68 87 75 91 82 77 86 82 75 79  
 Y: 74 79 80 93 88 79 97 95 89 92

Calculate the least-squares regression lines for these data.

#### SECTION-IV

- 7 a) Define (i) Sampling distribution (ii) point estimate (iii) Types of errors [8M]  
b) Explain in brief one tailed and two tailed tests [6M]

OR

- 8 a) Explain the procedure for hypothesis testing [7M]  
b) Discuss the test procedure for testing single mean of the population when size of the sample is large. [7M]

#### SECTION-V

- 9 a) Test the significance of the difference between the means of the samples from the following data: [7M]

|                    | Sample A | Sample B             |
|--------------------|----------|----------------------|
| Size of sample     | 100      | 150                  |
| Mean               | 50       | 51                   |
| Standard deviation | 4        | 5 (Table value=1.96) |

- b) Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same at 5% level. [7M]

OR

- 10 Fit a Poisson distribution to the following data and test the goodness of fit at 0.05 levels: [14M]

|                   |     |    |    |    |    |   |   |
|-------------------|-----|----|----|----|----|---|---|
| No. of accidents: | 0   | 1  | 2  | 3  | 4  | 5 | 6 |
| No. of days :     | 150 | 65 | 45 | 34 | 10 | 6 | 2 |
| *****             |     |    |    |    |    |   |   |

Code No: R17A0024

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R17

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**  
(Autonomous Institution - UGC, Govt. of India)

**II B.Tech I Semester Supplementary Examinations, November 2019**  
**Probability and Statistics**

**(CSE & IT)**

|         |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|

Time: 3 hours

Mat. Marks: 70

Note: This question paper Consists of 5 Sections. Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

\*\*\*\*

**SECTION-I**

1a Define Discrete and Continuous Random Variable

[4M]

b A random variable X has the following distribution

[10M]

|        |   |    |    |    |    |     |
|--------|---|----|----|----|----|-----|
| X:     | 1 | 2  | 3  | 4  | 5  | 6   |
| P(x) : | K | 3K | 5K | 7K | 9K | 11K |

Determine i). K ii).  $P(1 \leq x \leq 5)$  iii).  $P(x > 3)$

OR

2a Ten coins are thrown simultaneously. Find the probability of getting :

[7M]

i) At least one head ii) At most seven heads

b if 'X' is a normal variate with mean 30 and standard deviation 5. Find the probabilities that

[7M]

(i).  $26 \leq X \leq 40$  (ii).  $X \geq 45$

**SECTION-II**

3a Write the properties of Correlation coefficient.

[4M]

b Calculate the coefficient of correlation from the following data

[10M]

|   |    |   |   |    |    |    |   |
|---|----|---|---|----|----|----|---|
| X | 12 | 9 | 8 | 10 | 11 | 13 | 7 |
| Y | 14 | 8 | 6 | 9  | 11 | 12 | 3 |

OR

4 Using the following data obtain the equations of two regression lines:

[14M]

|   |    |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|----|
| X | 16 | 21 | 26 | 23 | 28 | 24 | 17 | 22 | 21 |
| Y | 33 | 38 | 50 | 39 | 52 | 47 | 35 | 43 | 41 |

**SECTION-III**

5a Define Sample and Population

[4M]

b Random sample of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same, at 5% level.

[10M]

OR

6a Define Parameter and Statistic

[4M]

b Explain the procedure for testing of hypothesis.

[10M]

**SECTION-IV**

7 A random sample of 10 boys had the following I.Q's: 70, 120, 110, 101, 85, 83, 95, 98,

[14M]



107 and 100. Do these data support the assumption of a population mean LQ of 100?

OR

- 8 The following table gives the classification of hair colour and eye colour. Find the value of chi-square. Is there good association between two? [14M]

| Eye Colour | Hair Colour |      |       |       |
|------------|-------------|------|-------|-------|
|            |             | Fair | Brown | Black |
| Blue       |             | 15   | 5     | 20    |
| Grey       |             | 20   | 10    | 20    |
| Brown      |             | 25   | 15    | 20    |
| Total      |             | 60   | 30    | 60    |

#### SECTION-V

- 9 A self service canteen employs one cashier at its counter. 8 customers arrive per every 10 minutes on average. The cashier can serve on average one per minute. Assuming that the arrivals are poisson and service time distribution is exponential, determine: [14M]  
 (i). The Average number of customers in the system (ii). The Average Queue length  
 (iii). The Average time a customer spends in the system (iv). Average time a customer spends in the queue.

OR

- 10a Define Markov chain and Markov process [4M]  
 b A training process is considered as a two state Markov chain. If it rains it is considered to be in state '0' and it does not rain the chain is in the state '1'. The transition probability matrix of the Markov chain is defined by [10M]

$$P = \begin{bmatrix} 0.6 & 0.4 \\ 0.2 & 0.8 \end{bmatrix}$$

Find the probability that it will rain after three days from today, assuming that the initial probabilities are 0.4 and 0.6.

\*\*\*\*\*

Code No: R15A0024

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

**II B.Tech I Semester Supplementary Examinations, November 2019****Probability and Statistics  
(CSE & IT)**

|         |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|
| Roll No |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|

**Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B

Part A is compulsory which carries 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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**PART-A (25 Marks)**

- 1). a State Baye's Theorem. [2M]
- b Derive mean of the poisson distribution. [3M]
- c Write the Formula of Rank Correlation Coefficient. [2M]
- d Show that correlation coefficient is geometric mean of regression coefficients. [3M]
- e What is Degree of Freedom (d.f) in small samples? [2M]
- f Define Point Estimation. [3M]
- g What are Type-I and Type-II errors in sampling? [2M]
- h Write the standard error of the statistic difference of two sample proportions. [3M]
- i Arrival rate is 3per hour and service rate is 5 per hour then find traffic intensity. [2M]
- j Verify whether the following matrix is stochastic or not [3M]  

$$\begin{bmatrix} 0 & 1 \\ 1/3 & 5/3 \end{bmatrix}$$

**PART-B (50 MARKS)****SECTION-I**

- 2 Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each draw. Find the probability that (i) Both are white (ii) First is red and second is white. [10M]

OR

- 3 A random variable X has the following probability function [10M]

|      |   |   |    |    |    |                |                 |                     |
|------|---|---|----|----|----|----------------|-----------------|---------------------|
| x    | 0 | 1 | 2  | 3  | 4  | 5              | 6               | 7                   |
| p(x) | 0 | K | 2K | 2K | 3K | K <sup>2</sup> | 2K <sup>2</sup> | 7K <sup>2</sup> + K |

(i) Determine K (ii) Mean (iii) Variance.

- 4 SECTION-II  
 $\sum x = 125, \sum x^2 = 650, \sum y = 100, \sum y^2 = 460, \sum xy = 508$  are the results [10M]  
 obtained in calculating correlation coefficient of  $x, y$  of 25 pairs. Later it is found that two pairs of  $x$  and  $y$  (8, 12) and (6, 8) are wrongly noted as (6, 14) and (8, 6) respectively. Obtain correct value of correlation coefficient.

OR

- 5 The regression equations of two variables  $x$  and  $y$  are  $3x + 2y - 26 = 0, 6x + y - 31 = 0$  find the correlation coefficient between  $x$  and  $y$ . [10M]

SECTION-III

- 6 A random sample of size 81 was taken whose variance is 20.25 and mean is 32, [10M]  
 construct 95% confidence interval.

OR

- 7 A population consists of 5, 10, 14, 18, 13 and 24. Consider all possible samples of [10M]  
 sizes two which can be drawn without replacement from the population. Find (i)  
 The mean of the population (ii) The standard deviation of the population (iii) The  
 mean of the sampling distribution of means (iv) The standard deviation of  
 sampling distribution of means.

SECTION-IV

- 8 A random sample of 10 bags of pesticide is taken whose weights are 50, 49, 52, [10M]  
 44, 45, 48, 46, 45, 49, and 45 (in kgs). Test whether the average packing can be  
 taken to be 50 kgs.

OR

- 9 It is claimed that a random sample of 49 tyres has a mean life of 15200km. This [10M]  
 sample was drawn from a population whose mean is 15150kms and a standard  
 deviation of 1200km. Test the significance at 0.05 level.

SECTION-V

- 10 A toll gate is operated on a frequency where cars arrive according to a poisson [10M]  
 distribution with mean frequency 1.2 cars/min the time of completing payment  
 follows an exponential distribution with mean of 20 seconds. find (i) the idle time  
 of the counter (ii) average number of cars in the system (iii) average number of  
 cars in the queue (iv) average time that a car spends in the system (v) average time  
 that a car spends in the queue.

OR

- 11 Explain stochastic matrix, Regular matrices with examples. Explain about [10M]  
 Classification of Stochastic Processes.

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**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**  
**(Autonomous Institution – UGC, Govt. of India)**

**UG Model question paper**  
**Managerial Economics and Financial Analysis**

**Time: 3 hours**

**Max Marks: 70**

**Note:** This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

**Section-I**

1. a) what is managerial economics? Discuss the nature & Scope of Managerial economics [7M]  
b) What is demand forecasting? Explain various factors involved in demand forecasting. [7M]

OR

2. a) Explain Law of Demand with its exceptions [7M]  
b) Distinguish between Micro and Macroeconomic concepts (7M)

**Section-II**

3. a) Define Production function. How can a producer find it useful? Illustrate. (7M)  
b) Define Cost. Explain the different cost concepts used in the process of Cost Analysis. (7M)

OR

4. a) Discuss about the economies and diseconomies of scale. (7M)  
b) Calculate the BEP in units and rupees using the following details: • Selling price per unit Rs. 100 • Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000 (7M)

**Section-III**

5. a) Define Market. Explain the structure of market with suitable examples.  
b) Define partnership. Explain its features and evaluate it as against sole proprietorship OR
6. a) what is price? Explain different methods of Pricing. (7M)  
b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have fulfilled that need? (7M)



7. a) What are the accounting concepts that govern accounting process? Explain in brief. (7M) b) Explain the main sources of long term finance. (7M)

**OR**

8. a) Explain the factors affecting the requirements of working capital. (7M)  
b) Explain about cash and capital budget. (7M)

### **Section-V**

9. a) What is capital budgeting? Explain methods of capital budgeting? (7M)  
b) What is ratio analysis? Explain different types of ratio analysis (7M)

**OR**

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposals under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return. (7M)

|                             | Year 1   | Year 2   | Year 3   | Year 4   | Year 5   |
|-----------------------------|----------|----------|----------|----------|----------|
| Proposal I                  | 80,000   | 2,40,000 | 3,20,000 | 4,80,000 | 3,20,000 |
| Proposal 2                  | 2,40,000 | 3,20,000 | 4,00,000 | 2,40,000 | 1,60,000 |
| Present value of Rs 1 @ 10% | 0.909    | 0.826    | 0.751    | 0.683    | 0.620    |

- b) What do you mean by capital budgeting? Explain its significance. (7M)

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**Time:3hours**

**Max Marks: 70**

**Note:** This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

**Section-I**

1. (a) Define managerial economics. Illustrate how it helps in solving managerial problems and explain the nature. (4M)
- (b) Explain different methods of demand forecasting (6M)
- (c) Briefly explain elasticity of demand. (4M)

**OR**

2. (a) What are the different kinds of elasticity of demand that are relevant to the manager of a firm? (7M)
- (b) How do you forecast demand for a new product? (7M)

**Section-II**

3. (a) Explain the concepts of cost and explain their contribution to managerial decisions. [9M]
- (b) Explain production function. [5M]

**OR**

4. (a) Discuss about isoquants. [4M]
- (b) What is meant by breakeven analysis? Explain its advantages. (4M)
- (c) Critically evaluate the law of diminishing marginal return. (6M)

**Section-III**

- 5(a) Explain the types of competition. [7M]
- (b) What is perfect competition and explain its features. [7M]

OR

6.(a) Explain the state/public enterprises and their various forms. [7M]

(b) What is the importance of pricing in a business organization? [7M]

### Section-IV

7(a) Write different types of shares [7M]

(b) Define Financial Accounting. Explain the importance and Limitations of Financial Accounting. (7M)

**OR**

8. (a) what is accounting? Explain the principles of accounting. (7M)

(b) write the format and importance of balance sheet. (7M)

### Section-V

9.(a) Illustrate the advantages and Disadvantages of NPV Method. (7M)

(b) A firm is considering two projects each with an initial investment of Rs.20,000 and a life of 4 years. The following is the list of estimated cash inflows after taxes and depreciation. (7M)

| year  | Proposal I | Proposal II | Proposal III |
|-------|------------|-------------|--------------|
| 1     | 12500      | 11750       | 13500        |
| 2     | 12500      | 12250       | 12500        |
| 3     | 12500      | 12500       | 12250        |
| 4     | 12500      | 13500       | 11750        |
| total | 50000      | 50000       | 50000        |

Predict Accounting Rate of Return on (i) Average Capital (ii) Original Capital Employed

**OR**

10(a) discuss different types of liquidity and activity ratios (7M)

(b) A Company has an estimated Life of 4 years and an investment opportunity costing Rs.2,50,000 with the following expected Net Cash flow After Taxes and Before Depreciation. (7M)

| Years | Net cash flows (rs) | P.V. of Rs.1 @24% D.f |
|-------|---------------------|-----------------------|
| 1     | 120000              | 0.806                 |
| 2     | 90000               | 0.650                 |
| 3     | 160000              | 0.524                 |
| 4     | 30000               | 0.423                 |

Calculate payback period and NPV using with 10% discounting factor

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**Managerial Economics and Financial Analysis**

**UG Model question paper**

**Time: 3 hours**

**Max Marks: 70**

**Note:** This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

**Section-I**

- 1.(a) Explain the influencing factors of the elasticity of demand. (7M)
- (b) Define managerial economics and explain its areas (7M)

**OR**

- 2.(a) What is demand forecasting? Explain various factors involved in demand forecasting. (7M)
- (b) What is elasticity of demand? And explain its types and measurement. (7M)

**Section-II**

- 3.(a) Explain the importance production function and describe the salient features of Cobb-Douglas production function (7M)
- (b) Describe the importance of Break-even analysis and Break-even point. (7M)

**OR**

- 4.(a) You are required to Determine i) P/V Ratio (ii) Break Even Point in Value (iii) Sales required to earn a profit of Rs.4,50,000 and (iv) Profit when Sales are Rs.21,60,000 from the following information (7M)

Fixed Expenditure Rs.90,000, Variable  
Cost Per unit :

Direct Material Rs.5  
Direct Labour Rs.2

Direct Overheads 100% of Direct Labour  
Selling price per unit Rs.12/-

(b) The Sales Turnover and profit during two years were given as follows: (7M)

| Years       | 2003     | 2004     |
|-------------|----------|----------|
| Sales(Rs.)  | 1,00,000 | 1,20,000 |
| Profit(Rs.) | 15,000   | 23,000   |

You are required to Compute the following: i) P/V Ratio ii) Fixed Cost iii) Break Even Point (Value) ii) Sales required to earn a profit of Rs.20,000 iii) Profit when Sales are Rs.1,25,00

### Section-III

(7M)

5.(a) define business. Explain its characteristics

(b) Explain the salient features of private limited and public limited companies (7M)

**OR**

(7M)

6. (a) Describe the features of perfect competition.

(b) Make a comparison among Monopolistic, Monopoly and Oligopoly competition? (7M)

### Section-IV

7.(a) Describe different types of capital. (7M)

(b) explain about different methods and sources of capital (7M)

**OR**

8.(a) Describe the advantages and disadvantages of double entry book keeping (7M)

(b) Prepare Trial Balance of Mr. Rajaram as on 31.12.2005 from the following balances:

|                             |                                |
|-----------------------------|--------------------------------|
| 1. Sundry Debtors 32,000    | 9. Stock as on 1.1.2005 22,000 |
| 2. Cash in Hand 35          | 10. Cash at Bank 1,545         |
| 3. Plant & Machinery 17,500 | 11. Sundry Creditors 10,650    |
| 4. Trade expenses 1,075     | 12. Sales 2,34,500             |
| 5. Salaries 2,225           | 13. Carriage Outwards 400      |
| 6. Rent 900                 | 14. Bills Payable 7,500        |
| 7. Purchases 2,18,870       | 15. Discount Allowed 1,100     |
| 8. Capital 79,500           | 16. Business Premises 34,500   |

### Section-V

9.(a) Briefly explain the traditional methods of capital budgeting. (7M)

(b) Briefly describe the modern methods of capital budgeting. (7M)

**OR**



10 (a) describe the advantages and disadvantages of traditional methods of capital budgeting

(7M)

(b) The following is an extract of a balance sheet of a company during the last year. Compute current ratio and quick ratio. Also interpret the ratios.

(7M)

|                                  |                               |
|----------------------------------|-------------------------------|
| Land and buildings 1,50,000,     | Plant and machinery 3,00,000, |
| Furniture and fixtures 1,25,000, | Closing stock 25,000,         |
| Sundry debtors 62,500,           | Wages prepaid 7,500,          |
| Sundry creditors 18,000,         | Rent outstanding 12,000       |