# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018
### Subject: PROBABILITY & QUEUING THEORY
Branch: CSE

Time: 3 hours                                                                      Max. Marks: 60

**PART – A**

**Answer ALL questions of the following**                              5x2Mark=10 Marks

1. Define probability with examples.

2. If x is Uniformly distributed in [a, b] then find E(x), V(x).

3. Define Regular matrix.

4. Explain Arrival and Service processes?

5. Distinguish between M/D/1 and M/Ek/1 models.

**PART-B**

**Answer any FIVE Questions of the following**                        5x 10 Marks= 50Marks

1. Two shipments of parts are received. The first shipment contains 1000 parts with 10% defective and the second contain 2000 parts with 5% defectives. Two parts are selected from a shipment selected at random and they are found to be good. Find the probability that the tested parts were selected from first shipment?

2. A bag contains 6 white and 9 black balls. Four balls are drawn at a time. Find the probability for the first draw to give 4 white and second draw to give 4 black balls in each of the following cases:
   (i) The balls are replaced before the second draw.
   (ii) The balls are not replaced before the second draw.

3. a) Suppose a continuous random variable X has the p.d.f. $f(x)=k(1-x^2)$ for $0<x<1$ and $f(x)=0$, otherwise, find  (i) K  (ii) Mean and variance.
   b) Average number of accidents on any day on a national highway is 1.8 determine, the probability that the number of accidents of (i) At least one (ii) Atmost one.

4. The mean and variance of a binomial variate X with parameters n and p are 16 and 8. Find (i) P(X=0) (ii) P(X=1) (iii) p(X≥2)

5. a) Suppose consumers arrive at a bank according to a poisson process with a mean rate of 3 per minute. Find the probability that during a time interval of 2 minutes exactly four customers arrive.
   b) If the consumers arrive at a bank according to a poisson process with a mean rate of 2 per minute. Find the probability that during a 1-minute interval no customer arrives.

6. A computer system can operate in two different modes. Every hour, it remains in the same mode or switches to a different mode according to the transition probability matrix P =

$$\begin{bmatrix} 0.4 & 0.6 \\ 0.6 & 0.4 \end{bmatrix}$$

   a) Compute the 2-step transition probability matrix.

   b) If the system is in Mode I at 5:30 pm, what is the probability that it will be in Mode I at 8:30 pm on the same day?

7. a) The KMC & Company uses a group of six identical machines; each machine operates an average of 20 hours between breakdowns. With randomly occurring breakdowns, the Poisson probability distribution is used to describe the machine breakdown arrival process. One person from the maintenance department provides the single-channel repair service for the six machines. The exponentially distributed service times have a mean of two hours per machine. Find the average time machine does not operate and average number of machines waiting for repairman's service.

   b) Explain (M/M/1):(N:FIFO) Model and state how you compute the average waiting time for the model.

8. A petrol service station has two petrol pumps. The service follows the exponential distribution with a mean of 4 minutes and the vehicles arrive for service as per poisson distribution at the rate of 10 per hour. Find the probability that a customer has to wait for service. What is the expected a customer has to wait in idle?

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018
### Subject: OPERATING SYSTEMS
### Branch: CSE

Time: 3 hours                                                                Max. Marks: 60

### PART – A

Answer ALL questions of the following                              5x2Mark=10 Marks

1. Define Multiprocessing?
2. Define Monitor.
3. Write a short note on safe state?
4. Distinguish between internal and external fragmentation.
5. List out the various layers of a file system.

### PART-B

Answer any FIVE Questions of the following                        5x 10 Marks= 50Marks

1. a) Explain the process state transition diagram with examples.
   b) Discuss the attributes of the process. Describe the typical elements of process control block.

2. a) Explain about the system programs.
   b) Explain about Operating system functions.

3. a) Discuss the following CPU Algorithms.
   i) Multi-level queue scheduling.
   ii) Multi-level feedback queue scheduling.
   b) Explain the advantage of using semaphores. Describe the use of wait() and signal() functions on semaphore and how these can provide the solution to the critical section problem.

4. Explain FCFS, SJF, Round Robbin scheduling (consider time quantum 3ms) algorithms. Find out total waiting time and turnaround time for the following processes.

| Process name | Process time |
|:---:|:---:|
| P1 | 25 |
| P2 | 3 |
| P3 | 3 |

5. a) Explain Dispatcher and Dispatcher latency?

   b) Define deadlock. What are the four necessary conditions for a deadlock situation to arise? How it can be prevented?

6. Consider the following snapshot of the system.

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

The following question by using Banker's Algorithm

   a) What is the content of matrix need?

   b) Is the system is safe state?

   c) If a request from process P1 arrives for (0,4,2,0) can the request be granned immediately?

7. a) Explain in detail about virtual memory management.

   b) Explain about various page table with an example?

8. a) List the Common File types along with their extension and describe it.

   b) Define Trusted System.

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

### Subject: COMPUTER ORGANIZATION

### Branch: CSE

Time: 3 hours                                                                                   Max. Marks: 60

## PART – A

**Answer ALL questions of the following**                                         5x2Mark=10 Marks

1. Explain about Fixed point and Floating point representations with example

2. What are the different memory referenced instructions?

3. What are the different computer instructions?

4. What are the various mechanisms for implementing I/O operations?

5. What is Vector Processing?

## PART-B

**Answer any FIVE Questions of the following**                                  5x 10 Marks= 50Marks

1. a) Explain in detail the functional units of a computer with a neat diagram.

   b) Explain arithmetic and logic micro operations with examples.

2. Write short notes on Multitasking.

3. a) Explain about different Computer registers

   b) Explain how X = (A + B) / ( A – B ) is evaluated in a stack based computer?

4. a) Explain input-output of memory?

   b) Explain briefly about an interrupt?

5. a) Hard wired control is faster than micro-programmed control unit. Justify this statement.

   b) What is the functioning of a Flash memory? Explain.

6. a) Explain the Secondary Storage.

   b) Write short notes on RAM

7. What is DMA? What are the terminologies of DMA?

8. a) Explain the types of computers.

   b) Discuss the types of instruction formats.

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **Data Base Management Systems**

Branch: CSE

Time: **3 hours**                                                                 Max. Marks: 60

### PART – A

Answer ALL questions of the following                                5x2Mark=10 Marks

1. Define an instance and schema.

2. What is join? Write types of joins

3. Define the rules in 2NF.

4. Define a lock. What are the different modes of a lock?

5. What is the difference between sequential accessing and random accessing devices?

### PART-B

Answer any FIVE Questions of the following                            5x 10 Marks= 50Marks

1. Explain about different types of database users. Write the functions of DBA.

2. a) What is relationship? Explain relationship sets.

   b) Write short notes on how database design can be using E-R Model.

3. a) Explain the general syntax of SELECT command.

   b) Explain about the use of Triggers in DBMS.

4. a) Explain Data manipulation language commands with examples.

   b) What are aggregate operators? Explain with examples.

5. Explain in detail about the FIRST, SECOND, THIRD and BCNF Normal forms with examples.

6. a) Explain in detail about Schema refinement in data base design?                    **[6M]**

   b) Explain with an example why 4NF is more desirable normal form than BCNF.        **[4M]**

7. a) Explain about Log-based Recovery.

   b) Write short notes on Two-phase locking protocol

8. a) Explain the limitations of static hashing. Explain how to overcome those limitations in
   Dynamic hashing.                                                                 **[6M]**

   b) Write a note on indexed sequential files.                                      **[4M]**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **Formal Languages And Automata Theory**

Branch: CSE

Time: 3 hours

Max. Marks: 60

### PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Construct a DFA accepting string over {0,1} that do not have three consecutive 1's.
2. State and explain the identity rules.
3. Discuss about pumping lemma for CFL.
4. Define Turing Machine and give example.
5. Write about un-decidability of Turing Machine.

### PART-B

Answer any FIVE Questions of the following

5x 10 Marks= 50Marks

1. a) Define DFA and NFA. Explain the difference between them with example.
   b) Design a Moore machine to determine the residue mod 5 for each binary string treated as integer.

2. a) Design DFA to accept strings c and d such that number d's are divisible by 4
   b) Design DFA which accepts string 1100 only.

3. Find a Regular expression corresponding to each of the following subsets over {0, 1}*.
   a) The set of all strings containing no three consecutive 0's.
   b) The set of all strings where the 10th symbol from right end is a 1.
   c) The set of all strings over {0,1} having even number of 0's & odd number of 1's

4. Use the Pumping Lemma to show that each of these languages is not regular:
   i) L={ww|w belongs to {0, 1}* }
   ii) L={$WW^R$ | W is a string of binary numbers and $W^R$ is 'W;  written in reverse}

5. a) Write about Sentential form
   b) Show that the CFG with productions  S→ a | Sa | bSS | SSb | SbS  is ambiguous.

6. a) Construct Pushdown Automata to recognize the language of equal number of a's and b's.
   b) What do you mean by an instantaneous description of a PDA. Explain with an example.

7. Define a Turing machine (TM) and the language accepted by a TM.  Design a TM for reorganizing the language (a+b)*aba(a+b)*. Draw its transition diagram and table.  Using the Instantaneous Description notation.  Process the string "aabaabaaab".

8. a) Write about P and NP Problems.
   b) Write about Decidability of Problems.

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **Formal Languages And Automata Theory**

Branch: CSE

Time: 3 hours                                                                Max. Marks: 60

## PART – A

**Answer ALL questions of the following**                 5x2Mark=10 Marks

1. Construct a DFA accepting string over {0,1} that do not have three consecutive 1's.
2. State and explain the identity rules.
3. Discuss about pumping lemma for CFL.
4. Define Turing Machine and give example.
5. Write about un-decidability of Turing Machine.

## PART-B

**Answer any FIVE Questions of the following**             5x 10 Marks= 50Marks

1. a) Define DFA and NFA. Explain the difference between them with example.
   b) Design a Moore machine to determine the residue mod 5 for each binary string treated as integer.

2. a) Design DFA to accept strings c and d such that number d's are divisible by 4
   b) Design DFA which accepts string 1100 only.

3. Find a Regular expression corresponding to each of the following subsets over {0, 1}*.
   a) The set of all strings containing no three consecutive 0's.
   b) The set of all strings where the 10th symbol from right end is a 1.
   c) The set of all strings over {0,1} having even number of 0's & odd number of 1's

4. Use the Pumping Lemma to show that each of these languages is not regular:
   i) L={ww|w belongs to {0, 1}* }
   ii) L={WW$^R$ | W is a string of binary numbers and W$^R$ is 'W; written in reverse}

5. a) Write about Sentential form
   b) Show that the CFG with productions  S→ a | Sa | bSS | SSb | SbS  is ambiguous.

6. a) Construct Pushdown Automata to recognize the language of equal number of a's and b's.
   b) What do you mean by an instantaneous description of a PDA. Explain with an example.

7. Define a Turing machine (TM) and the language accepted by a TM.  Design a TM for reorganizing the language (a+b)*aba(a+b)*. Draw its transition diagram and table.  Using the Instantaneous Description notation.  Process the string "aabaabaaab".

8. a) Write about P and NP Problems.
   b) Write about Decidability of Problems.