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, MAY-2019

Subject: **Formal Language and Automata Theory**

Branch: **CSE**

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

PART – A

Answer **ALL** questions of the following   **5x2Marks=10 Marks**

1. Design DFA for accepting the set of all integers.
2. Construct Deterministic Finite Automata for the Regular Expression **(a+b)*abb.**
3. Discuss about deterministic context free language.
4. Define Turing Machine and give example.
5. Write short notes on LR(0) Grammar.

PART-B

Answer any **FIVE** Questions of the following   **5x10 Marks= 50Marks**

1. Explain the procedure to minimize a DFA. Minimize the following DFA
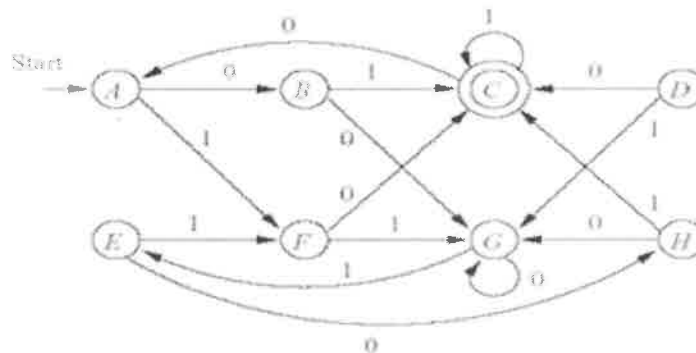
2. a) Define DFA and NFA. Explain the difference between them with example.
   b) Design a Moore machine to determine the residue mod 5 for each binary string treated as integer.
3. a) Explain Identity Rules. Give an example using Identity Rules for the simplification.
   b) Explain Pumping lemma for regular sets.
4. 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
5. a) Define Deterministic pushdown automata. Explain with an example.
   b) Difference between Finite Automata and Push down Automata
6. A) Convert the following grammar into GNF: S->AB, A->BS/b, B->SA/a.
   B) Eliminate the unit productions from the following grammar
      S→AB, A→a, B→C/b, C→D, D→E/bc, E→d/Ab
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 a context sensitive grammar with productions that generate the language
      L= { $a^n b^n$ / n>=0 }
   b) Explain Post's Correspondence Problem (PCP) with an example

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: <u>Computer organization</u>

Branch: CSE

Time: 3 hours   Max. Marks: 60

PART – A

Answer **ALL** questions of the following   5x2Marks=10 Marks

1. Give any four differences between multi processor systems and multi computer systems.

2. What are the registers generally contained in the computer?

3. Give any four differences between Primary memory and secondary memory.

4. How many bits are needed to store the result obtained in addition, subtraction, multiplication and division operations of two n-bit unsigned numbers?

5. Explain Arithmetic pipeline.

PART-B

Answer any **FIVE** Questions of the following   5x10 Marks= 50Marks

1. a) Explain the interconnection structure between the processor and main memory.

   b) Explain about Fixed point and Floating point representations with example

2. a) Give the comparisons between RISC and CISC architecture with neat diagram.

   b) Explain Stack Organization with an example

3. a) Compare hardwired control and microprogrammed control.

   b) With a block diagram explain the virtual memory organization.

4. Derive an algorithm in flow chart for Booth multiplication of signed-2's complement numbers

5. a) Write short notes on Instruction Pipeline

   b) How does conditional branch instruction affect the performance of instruction pipelining? Explain with the help of timing diagram.

6. a) Write short notes on ROM

   b) Explain one stage of arithmetic logic shift unit.

7. a) Write short notes on RISC

   b) What are the Instruction codes?

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

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

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Probability and Queueing Theory**

Branch: CSE

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

PART – A

Answer **ALL** questions of the following   **5x2Marks=10 Marks**

1. State Boole's Inequality.

2. A fair coin is tossed 6 times find the probability of getting 4 heads.

3. Chapman Kolmogorov equation

4. What is meant by Queue discipline?

5. Define Balking

PART-B

Answer any **FIVE** Questions of the following   **5x10 Marks= 50Marks**

1. a) Suppose a problem in Statistics is given to three students A, B and C. Their probabilities of solving the same independently are 1/2, 1/3, and 1/4 respectively. What is the probability that exactly one of them will solve the problem?

   b) If A, B and C are mutually exclusive and exhaustive events and, $P(A)=1/2\ P(B)$, $P(B)=2/3P(C)$ find $P(A)$, $P(B)$ and $P(C)$.

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. The number of students taking the Scholastic Aptitude Test (SAT) has risen to an all-time high of more than 1.5 million last year. Students are allowed to repeat the test in hopes of improving the score that is sent to college and university admission offices. The number of times the SAT was taken and the number of students are as follows.

No. of times:	1	2	3	4	5
No. of Students:	7,21,769	6,01,325	1,66,736	22,299	6,730

   a) Let X be a random variable indicating the number of times a student takes the SAT. Show the probability distribution for this random variable.
   b) What is the probability that a student takes the SAT three or more times?
   c) What is the expected value of the number of times the SAT is taken? What is your interpretation of the expected value?
   d) What is the variance and standard deviation for the number of times the SAT is taken?

4. 10% of the bolts produced by a certain machine turn out to be defective. Find the Probability that in a sample of 10 tools selected random exactly two will be defective using (i) Binomial Distribution (ii) Poisson Distribution and comment upon the result.

5. a) A fair die is tossed repeatedly. If X_n denotes the maximum of the numbers occurring in the first "n" tosses ,Find the transition probability matrix P of the markov chain $\{X_n\}$. Find also P^2 and $P\{X_2=6\}$.

   b) Explain Pure Birth-Death process.

6. a) Explain Markov process, transition probability, equilibrium of steady state.

   b) Define random walk models and stochastic matrix

7. a) A typist at an office receive, on the average 22 letters per day for typing. The typist works for 8 hrs a day and it takes on an average 20 minutes to type a letter. (i) What is the typist's utility rate? (ii) What is the average waiting time needed to have a letter typed?

   b) Describe briefly regarding the applications of Queuing Models

8. A two-channel waiting line with Poisson arrival has a mean rate of 50 per hour and exponential service with mean rate of 75 per hour for each channel. Find (i) the probability of an empty system (ii) the probability that an arrival in the system will have to wait (iii) the average waiting time of customer in the system.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Data Base Management Systems**

Branch: CSE

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

PART – A

Answer **ALL** questions of the following   **5x2Marks=10 Marks**

1. Write about database system applications

2. Define Primary key and Foreign key.

3. What is a multivalued dependency?

4. What is a transaction? List the properties of transaction

5. What is Hashing?

PART-B

Answer any **FIVE** Questions of the following   **5x10 Marks= 50Marks**

1. a) Explain the levels of Data Abstraction with an example.

   b) Write about the roles of Database Administrator

2. What is database design? Explain different steps involved in database design.

3. a) Explain about the Integrity constraints.

   b) Explain about the Data Manipulation commands.

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

   b) Explain about the use of Triggers in DBMS?

5. a) What is Data Redundancy? Explain with an example

   b) Explain about Trivial and Non Trivial Dependencies.

6. a) What is trival and non trival dependence?

   b) What are the problems caused by redundancy? Explain.

7. a) Describe about Timestamp based Protocols.

   b) Write about Rigorous two-phase locking protocol

8. a) What are ordered Indices? Explain with an example.

   b) Explain in detail about Dynamic Hashing.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Operating Systems**

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer **ALL** questions of the following   5x2Marks=10 Marks

1. What is meant by System call? Describe the use of fork () and exec () system calls.
2. Define race condition
3. What are the necessary conditions of Deadlock?
4. Write about demand paging.
5. Define file operations.

PART-B

Answer any **FIVE** Questions of the following   5x10 Marks= 50Marks

1. a) Explain about the system programs.
   b) Explain about Operating system functions.
2. a) Explain about process creation and process termination on process?
   b) Write briefly about operating system structure?
3. a) Does an operating system generally need to keep about running processes in order to execute them? Explain in detail.
   b) Describe the use of Test (), Set () and swap () functions on synchronization Hardware and How these provide the solution to the critical section problem?
4. Explain about various threading issues?
5. a) Discuss in detailed about the technique of Deadlock detection (Single instance of each resource type).
   b) What is starvation? Illustrate with an example
6. Consider system consisting m resources of the same type being shared by n processes. Resources can be requested and released by process only one at a time. Show that the system is deadlock free it the following conditions hold
   a) The maximum need of each process is between 1 and m resources.
   b) The sum of maximum need is less than m + n.
7. a) Discuss in detail the performance issues of secondary storage management.
   b) Suppose we have files F1 to F4 in sizes of 7178, 572, 499 and 1195 bytes. Our disk has fixed physical block size of 512 bytes for allocation. Explain, how many physical blocks would be needed to store these four files if we were to use a chained allocation strategy assuming that we need 5 bytes of information to determine the next block in the link? (Measured as a percentage of the file size itself)
8. a) Explain about file sharing?
   b) Explain file allocation methods?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Human Values and Professional Ethics**

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer **ALL** questions of the following

5x2Marks=10 Marks

1. How an 'empathetic' individual understands others very well?

2. State the models of Professional Roles

3. Discuss briefly about respect for authority.

4. Discuss briefly about Intellectual Property Rights

5. Discuss the importance of Understanding Self.

PART-B

Answer any **FIVE** Questions of the following

5x10 Marks= 50Marks

1. a) Define moral character.

   b) Write uses of ethical theories.

2. Critically examine the issues in professional ethics in the current scenario. List any five unethical practices in profession today and the methods being tried to curb them.

3. "What do you understand by professional ethics, examine the issues in professional ethics in the current competitive scenario and state any five unethical practices in engineering profession?

4. a) Define principle of 'Cooperation'.

   b) Why 'Respect' is a starting point for ethics.

5. Value clarification consists of "helping people clarify what their lives are for and what is worth working for." Discuss and brief on the methods of building self-confidence in employees.

6. What do you mean by loyalty, the two senses of loyalty and what is the relationship between the loyalty to the company and professional responsibility to the public?

7. What are the general procedures for implementing the right to due process, differentiate human rights and professional rights?

8. Brief on the following

   a) State the global ethical issues and moral leadership

   b) Brief on the gender based discrimination issues in engineering industries.

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