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 REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-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. Design DFA for accepting the set of all integers.
2. Describe in the English language, the sets represented by the following regular expressions :

   a(a+b)*ab

   a*b+b*a

3. State and explain the closure properties of Context Free Languages.
4. Write the limitations of Turing machines.
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
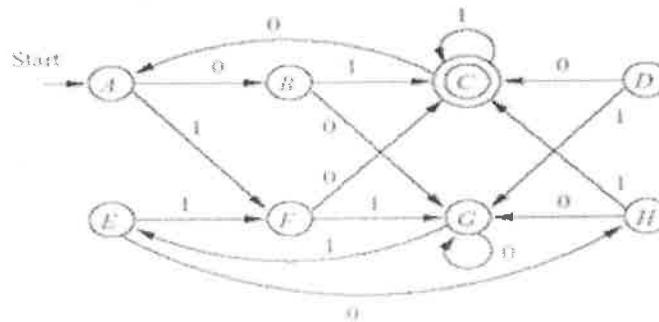
2. a) Write a short note on Melay machines
   b) Construct DFA and NFA for L={w ∈ {0,1}* | w contains the substring 0101}.
3. a) List the closure properties of regular sets.
   b) Explain about right linear and left linear grammars with examples.
4. a) Explain Identity Rules. Give an example using Identity Rules for the simplification.
   b) Explain Pumping lemma for regular sets.
5. a) Define Push Down Automata and explain its model with a neat diagram.
   b) List the properties of CFLs.
6. a) Explain the steps involved in eliminating useless symbols in a given context free Grammar.
   b) Formally define acceptance of Pushdown Automata by empty stack and final state.
7. a) Differentiate between Recursive and Recursively Enumerable languages.
   b) Design a **Turing Machine** to accept all palindromes over **0's** and **1's** and show the moves of Turing machine for the string **0110110**.
8. a) Construct **LR(0)** for

   A → aAa / B

   B → b

   b). write about Post's correspondence problem.

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II B.TECH II SEMESTER REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: Computer Organization

Branch: CSE

Time: 3 hours   Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2M=10 Marks

1. What are the different Phases in Instruction Cycle?

2. What is stack organization?

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. What is parallel processing?

PART – B

Answer any FIVE questions of the following   5x10M=50 Marks

1. a) Explain Bus Structure in detail with neat diagram.

   b) Explain Logic and Shift Micro operations in detail.

2. a) Draw the functional diagram of a computer and explain each block

   b) Explain Multi processor and multi computer

3. a) What are the types of addressing modes and explain in brief. Why do we need so many addressing modes?

   b) Explain in brief Reduced instruction set computer.

4. a) What is Instruction? Explain Data transfer and Manipulation instructions.

   b) Write short notes on Strobe control

5. Why do we need subroutine register in a control unit? Explain.

6. What is address sequencing? Explain why it is important.

7. a) What are the functions of an I/O interface? Explain with a block diagram I/O interface.

   b) What is Priority Interrupt?

8. a) Explain space-time diagram for Pipeline?

   b) Differentiate between parallel processing and arithmetic pipelining.

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II B.TECH II SEMESTER REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-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 an Operating System? Give examples of Operating Systems

2. Briefly discuss the "Dining Philosophers' problem".

3. List out the Four data structures used in Banker's Algorithm

4. What do you mean by Thrashing?

5. Define file operations.

PART-B

Answer any FIVE questions of the following   5x10 Marks= 50Marks

1. a) Explain about process creation and process termination on process?

   b) Write briefly about operating system structure?

2. a) Demonstrate the applications of System Calls?

   b) Write about Objectives of Operating Systems.

3. Explain about various threading issues?

4. a) Explain various scheduling criteria's?

   b) Justify the role of Semaphores in Concurrency?

5. Explain about deadlock detection technique for several instances of each resource type with an example?

6. What is Deadlock? How are Resource Allocation Graphs helpful in describing Deadlocks?

7. a) Write short notes on Swap-space management.

   b) Given memory partitions of 100K, 500K, 200K, 300K and 600K (in order), how would each of the first-fit, Best-fit and Worst-fit algorithms place processes of 212K, 417K, 112K and 426K (in order)? Explain, which algorithm makes the most efficient use of memory?

8. a) Write a short note on File system implementation.

   b) Write about Viruses.

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II B.TECH II SEMESTER REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Probability & Queuing Theory**

Branch: CSE

Time: 3 hours   Max. Marks: 60

PART-A

Answer ALL questions of the following   5 x 2 M=10 M

1. Define Conditional Probability
2. Define Geometric distribution and state its mean and variance.
3. Define stationary process.
4. Distinguish between steady state and transient state.
5. Distinguish between Balking and reneging.

PART-B

Answer any FIVE questions of the following   5 x 10 M=50 M

1. a) If $P(A) = 0.4$, $P(B / A) = 0.35$, $P(A \cup B) =0.69$, then find $P(B)$.
   b) The prior probabilities for events A_1 and A_2 are $P(A_1) = 0.40$ and $P(A_2) = 0.60$. It is also known that $P(A_1 \cup A_2) = 0$. Suppose $P(B /A_1) = 0.20$ and $P(B / A_2) = 0.05$.
      i) Are A_1 and A_2 mutually exclusive? Explain.
      ii) Compute $P(A_1 \cap B)$ and $P(A_2 \cap B)$.
      iii) Compute $P(B)$.
      iv) State Bayes' theorem and apply the same to compute $P(A_1 / B)$ and $P(A_2 / B)$.

2. 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).

3. a) Observations on the yield of a chemical reaction taken at various temperatures were recorded as shown below. Fit a simple linear regression and interpret the regression coefficient.
   b) During a survey conducted recently, it is observed that a worker spends an average of 77 hours logged on to the Internet (Mobile/PC) while at work. Assume the population mean is 77 hours, the times are normally distributed, and that the standard deviation is 20 hours.
      i) What is the probability that a randomly selected worker spent fewer than 50 hours logged on to the Internet?
      ii) What percentage of workers spent more than 100 hours logged on to the Internet?
      iii) A person is classified as a heavy user if he or she is in the upper 20% of usage. How many hours did a worker have to be logged on to the Internet to be considered a heavy user?

X (°C)	150	150	200	250	250	300	150	200	200	250
Y (%)	75.4	77.7	81.2	84.4	85.5	85.7	89.0	89.4	90.5	94.8

3,a.

4. a) If X is a poisson variant with λ find $E(x), V(x)$
   b) Find the coefficient correlation for the following data

Wages	100	101	102	102	100	99	97	98	96	95
Cost of living	98	99	99	97	95	92	95	94	90	91

5. a) Derive Chapman-Kolmogorov equations for a 3-state Markov Chain.
   b) Define erigodic chain.

6. The Transition probability matrix of the Markov chain $\{X_n\}$ with n=1,2,3,.... having three states 1,2,3 is

$$P= \begin{bmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{bmatrix}$$

And the initial distribution is $P^{(0)}= (0.7, 0.2, 0.1)$ find:
(i) $P(X_2=3)$ and
ii) $P(X_3=2, X_2=3, X_1=3, X_0=2)$.

7. The mean rate of arrival of planes at an airport during the peak period is 20 hours. The number of arrivals in any hour follows a Poisson distribution. When there is congestion the planes are forced to flyover the field in the stack awaiting the landing of other planes that arrived earlier. 60 planes per hour can land in good weather and 30 planes per hour can land in bad weather.
   a) How many planes would be flying over the field in the stack on an average in good weather and in bad weather?
   b) How long a plane would be in the stack in the process of landing in good and bad weather?

8.. A Mechanic repairs 4 machines the mean time between service requirements is 5 hours for each machine and forms an exponential distribution the mean repair time is 1 hour and also follows the same distribution pattern. Machine downtime costs of Rs 25 per hour and the mechanic cost of Rs 55 per day. Determine the following Probability that the service facility will be idle.

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II B.TECH II SEMESTER REGULAR AND SUPPLMENTARY EXAMINATIONS, MAY-2018

Subject: **Data Base Management Systems**

Branch: CSE

Time: 3 hours

Max. Marks: 60

PART-A

Answer ALL Questions of the following   5x2M=10M

1. Write difference between Database and file system.
2. Explain rollback.
3. What is a multivalued dependency?
4. Write about isolation and consistency.
5. What is indexing

PART-B

Answer any FIVE Questions of the following   5x10M=50M

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) Consider the following schema given. The primary keys are underlined.

   Sailors (<u>sailor-id</u>, sailor-name, sailor-rating, sailor-age)

   Boats (<u>boat-id</u>, boat-name, boat-color)

   Reserves (<u>sailor-id, boat-id</u>, day)

   Write the relational algebra queries.   [1M+1M+2M+2M]

   i. Find the names of sailors who have reserved boat number 120

   ii. Find the names of sailors who have reserved a green boat

   iii. Find the names of sailors who have not reserved a green boat

   iv. Find the names of sailors with the highest rating

   b) Explain the GROUP BY and HAVING clauses.   [4M]

4. a) What is meant by Tuple relational calculus? Explain various operations in it.

   b) Explain the distinctions among the terms primary key, candidate key and super key.

5. What is normal form? Explain about First, Second and Third normal forms.

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

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

7. Explain about Timestamp-based protocols.

8. a) Explain about B- tree index files.

   b) What is file organization? Explain in detail about data dictionary storage.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Human Values And Professional Ethics**

Branch: **CSE**

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

PART – A

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

1. Differentiate Values, Morals and Ethics.

2. List out few variety of Moral Issues.

3. 'Goal setting helps an in individual to channelize his/her efforts and strengths'. Substantiate.

4. What is the role Valuing Time in life skills?

5. 'Sense of humor plays an important role in mental wellbeing and maintaining good human relations of an individual'. Substantiate the statement.

PART-B

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

1. Write short notes on Gilligan's theory of cognitive development.

2. Explain Kohlberg's theory of moral development.

3. What is meant by Ethics, work ethic, state three major areas of study within Ethics and brief on factors that determine a strong work ethic?

4. Write short notes on
   a) Conflict of Interest.
   b) Moral leadership.

5. Discuss the following concepts briefly
   a) Differentiating right or wrong.
   b) Adaptability

6. Write a short note on the following:
   a) Confidentiality   b) Employee Rights   c) Occupational Crime

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

8. How to bring Harmony at various level? List down the foundation value and the complete value in human relationship - Explain each with one example.