Stanley College of Engineering & Technology for Women (A)

B.E (CSE/CME/AI&DS/IT) IV Semester Main Examination -July-2023

Operating Systems

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory.Answer any Four out of remaining Six questions.
   ii. Answer to each question must be written at one place only and in the same
       order as they occur in the Question paper.
   iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. List out different services of operating systems.   [2M CO1 BTL1]

   b. What is a thread? Name the benefits of thread.   [2M CO2 BTL1]

   c. Classify the necessary conditions for Deadlock.   [2M CO3 BTL2]

   d. What is virtual memory?   [2M CO4 BTL1]

   e. Describe page fault.   [2M CO4 BTL2]

   f. Mention the key evaluation points of RAID System.   [2M CO5 BTL1]

Part-B   4X12=48M

2. a) Define OS and explain functions of OS.   [6M CO1 BTL2]

   b) What is system call? Identify various types of system calls in detail.   [6M CO1 BTL3]

3. a) From the below given data. Draw Gantt charts illustrating the execution of the processes using
      FCFS and SJF scheduling algorithms and calculate the average turnaround time and waiting
      time for them.   [6M CO2 BTL2]

Processes	Arrival Time	Burst Time
P1	0	4
P2	1	2
P3	2	2
P4	3	5
P5	4	6

   b) Define process. Draw and explain various Process States in detail.   [6M CO2 BTL3]

4. a) Illustrate about critical-section problem and Peterson's solution in concurrency. [6M CO3 BTL2]

   b) How to apply the monitors to solve the dinning philosopher's problem with example?
                                                                          [6M CO3 BTL3]

5. a) Differentiate external fragmentation with internal fragmentation.   [6M CO4 BTL4]

   b) Distinguish about Logical and Physical Addressing.   [6M CO4 BTL4]

6. Consider the following page reference string:
      7,2,3,1,2,5,3,4,6,7,7,1,0,5,4,6,2,3,0,1
   Assuming the demand paging with three frames, determine how many page faults would occur
   for the following replacements algorithms?
            a. LRU   b. FIFO   c. Optimal   [12M CO4 BTL5]

7. a) Summarize about file attributes, file operations, and file types.   [6M CO5 BTL2]

   b) Discuss any two of disk scheduling algorithms with reference blocks. [6M CO5 BTL6]

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Stanley College of Engineering & Technology for Women (A)
B.E(CSE) IV Semester (Main) Examinations-July-2023
Artificial Intelligence

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory.Answer any Four out of remaining Six questions.

ii. Answer to each question must be written at one place only and in the same
order as they occur in the Question paper.

iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Define Heuristic search technique.   [2M, CO2, BTL1]

   b. List the applications of AI.   [2M, CO2, BTL2]

   c. Explain Semantics.   [2M, CO2, BTL2]

   d. Define forward Search method.   [2M, CO3, BTL1]

   e. What is α-cut threshold?   [2M, CO4, BTL2]

   f. Define reinforcement learning.   [2M, CO4, BTL1]

Part-B   4X12=48M

2. a) Explain State Space search Technique and Features.   [6M.CO1, BTL2]

   b) Explain Travelling salesperson problem using state space search technique. [6M.CO1, BTL2]

3. a) Differentiate between BFS and DFS.   [6M.CO2, BTL3]

   b) Explain A* Algorithm.   [6M.CO1, BTL2]

4. a) Explain types of knowledge representation techniques.   [6M.CO2, BTL2]

   b) Explain structured knowledge representation technique.   [6M.CO2, BTL2]

5. a) Describe STRIPS and Susman anomaly.   [6M.CO3, BTL2]

   b) Explain hierarchical planning technique.   [6M.CO3, BTL2]

6. a) Brief about Fuzzy logic system.   [6M CO4, BTL3]

   b) Explain Bayes theorem in detail.   [6M CO4, BTL2]

7. a) Explain passive and active reinforcement learning technique. [6M CO4, BTL2]

   b) Explain AI in present and future.   [6M CO4, BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (CSE/CME) IV Semester (Main) Examinations-July-2023

Database Management Systems

Time: 03 Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
  ii. Answer to each question must be written at one place only and in the same
      order as they occur in the Question paper.
  iii. Missing data, if any, may be suitably assumed.

	Part-A	**6X2=12M**
1.a.	What is data model?	[2M CO1 BTL1]
b.	Who is Database Administrator?	[2M CO1 BTL1]
c.	What is join operation?	[2M CO2 BTL1]
d.	What are entity set and relationship set?	[2M CO3 BTL1]
e.	What is the main difference between sparse index and dense index?	[2M CO4 BTL1]
f.	Define dead lock.	[2M CO5 BTL1]

	Part-B	**4X12=48M**
2. a)	Explain briefly, the applications of DBMS.	[6M CO1 BTL2]
b)	List out the database users. Explain.	[6M CO1 BTL2]
3. a)	When not to use DBMS?	[6M CO1 BTL2]
b)	Interpret concepts of schema, instance and data independence.	[6M CO1 BTL3]
4. a)	Interpret integrity constraints with examples.	[6M CO2 BTL3]
b)	Differentiate between nested and correlated queries.	[6M CO2 BTL3]

5. a) Draw the complete ER diagram for the following Bank database.   [8M CO3 BTL3]
     i) There are multiple banks and each bank has many branches and each branch has
        multiple customers.
     ii) Customers have various types of accounts.
     iii) Some customers also had taken different types of loans from these bank branches.
     iv) One customer can have multiple accounts and loans.

  b) Interpret 3NF with an example.   [4M CO3 BTL3]

6. a)	Explain storage structure.	[6M CO4 BTL2]
b)	Explain about serializability.	[6M CO4 BTL2]
7. a)	Interpret compatibility of locks.	[6M CO5 BTL3]
b)	Interpret lock based protocols.	[6M CO5 BTL3]

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Stanley College of Engineering & Technology for Women (A)

B.E (AI&DS) IV Semester (Main) Examinations-July-2023

Computer Networks

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
  ii. Answer to each question must be written at one place only and in the same
      order as they occur in the Question paper.
  iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. List the Topologies present in the computer networks.   [2M CO1 BTL1]

   b. What is the meaning of single bit correction?   [2M CO2 BTL1]

   c. Define Tunneling Mechanism.   [2M CO3 BTL1]

   d. What is the meaning of Maximum Transmission unit?   [2M CO4 BTL1]

   e. Define Domain Name Space.   [2M CO5 BTL1]

   f. List any two error detection mechanism.   [2M CO2 BTL1]

Part-B   4X12=48M

2. a) Explain about OSI reference Model.   [6M CO1 BTL2]

   b) Compare Circuit Switching and Packet Switching.   [6M CO1 BTL4]

3. a) Demonstrate Hamming Code with example.   [6M CO2 BTL2]

   b) Explain Go-back-N- ARQ protocol with neat diagram and example.   [6M CO2 BTL5]

4. a) Compare Virtual and Datagram Networks.   [6M CO3 BTL4]

   b) Apply Link State Routing for the given diagram.   [6M CO3 BTL3]
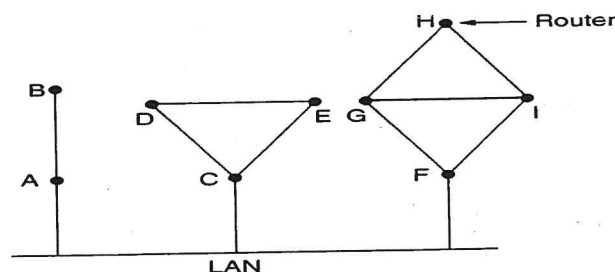
5. a) Explain about crash recovery.   [6M CO4 BTL2]

   b) Summarize about TCP connection establishment and release.   [6M CO4 BTL2]

6. a) Compare SMTP , FTP and HTTP.   [6M CO5 BTL4]

   b) Explain about Asynchronous and select system call.   [6M CO5 BTL2]

7. a) Summarize about OSPF and BGP.   [6M CO3 BTL2]

   b) Explain about UDP protocols.   [6M CO4 BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (AI&DS) IV Semester (Main) Examinations-July-2023
Artificial Intelligence & Robotics

Time: 03 Hours

Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.

ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.

iii. Missing data, if any, may be suitably assumed.

Part-A

6X2=12M

1. a. Define concept of Agent based intelligent representation. [2M CO1 BTL1]

   b. Write about Semantic nets. [2M CO2 BTL3]

   c. Why do we use expert system in AI? [2M CO3 BTL1]

   d. What is planning? [2M CO3 BTL1]

   e. Where is Bayes rule used? [2M CO3 BTL3]

   f. What are the future applications of Robot? [2M CO5 BTL4]

Part-B

4X12=48M

2. a) Explain the effect of overestimation and underestimation of it on A* algorithm. [6M CO1 BTL2]

   b) Define Artificial Intelligence and list the task domains of Artificial Intelligence. [6M CO1 BTL1]

3. a) Describe the types of domains in Constraint Satisfaction Problems. [6M CO2 BTL2]

   b) What are the challenges of Knowledge Representation and Reasoning (KRR)? [6M CO2 BTL2]

4. a) What are 4 applications of expert system? [6M CO3 BTL1]

   b) Explain about partial order planning and hierarchical planning. [6M CO3 BTL2]

5. a) Explain about uncertainty and also describe about Belief networks. [6M CO3 BTL2]

   b) Give detailed description of different types of fuzzy inference systems. [6 M CO3 BTL4]

6. a) Define the term 'Robot'. Explain different Robot types. [6 M CO4 BTL1]

   b) Explain the basic components of Robot with suitable example. [6 M CO5 BTL2]

7. a) Describe different examples of adversarial search problems. [7M CO1 BTL2]

   b) Discuss about fuzzy hedges. [5M CO3 BTL2]

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Stanley College of Engineering & Technology for Women (A)
B.E (AI&DS) IV Semester (Main) Examinations-July-2023
Data Science

Time: 03 Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining six questions.
   ii. Answer to each question must be written at one place only and in the same
       Order as they occur in the Question paper.
   iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Explain the concept of vectors in R programming.   [2M CO4 BTL1]

    b. Define database data and transactional data.   [2M CO1 BTL1]

    c. Explain data transformation with an example.   [2M CO3 BTL2]

    d. Explain the process of creating groupings in data analysis.   [2M CO4 BTL2]

    e. How do locate data on a web page before coding for web scraping.   [2M CO4 BTL4]

    f. What is the importance of string manipulation in data analysis?   [2M CO4 BTL2]

Part-B   4X12=48M

2. a. Discuss the concept of control structures in R programming.   [6M CO2 BTL2]

   b. Explain the concept of UNIX time. Write R code to get what day of the week was '15th
      August 1947'.   [6M CO2 BTL3]

3. a. Discuss Hypothesis Testing, Type-I and Type-II error.   [6M CO2 BTL2]

   b. Explain measuring data dissimilarity. How do you evaluate dissimilarity matrix for
      nominal and ordinal attributes?   [6M CO3 BTL5]

4. a. What is merging and discuss the different types of merging with R code? [6M CO4 BTL3]

   b. Explain the concept of NoSQL databases and their role in data storage. [6M C01 BTL2]

5. a. How can you identify correlations and outliers in data analysis?   [6M CO4 BTL4]

   b. Discuss how box plots are used for identifying outliers and difference between
      histograms and bar plots.   [6M CO3 BTL4]

6. a. Explain the concept of browser-based parsing in web scraping.   [6M CO4 BTL2]

   b. How can you perform screen reading using RSelenium in web scraping? [6M C02 BTL3]

7. Explain the data science process in detail, highlighting the key steps involved and the role
   of each step in solving real-world problems.   [12M CO5 BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (CSE/CME/EEE) IV Semester (Main) Examinations -July-2023

Effective Technical Communication

Time: 03 Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
  ii. Answer to each question must be written at one place only and in the same
      order as they occur in the Question paper.
  iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Explain any TWO barriers for communication.   [2M CO1 BTL 1]

   b. What is the process of communication?   [2M CO2 BTL1]

   c. Explain any TWO types of listening skills.   [2M CO3 BTL1]

   d. What is kinesics?   [2M CO4 BTL2]

   e. Write about the purpose of user manual.   [2M CO5 BTL2]

   f. Write advantages of an Email.   [2M CO4 BTL3]

Part-B   4X12=48M

2. a) Explain various barriers for technical communication.   [6M CO1 BTL2]

   b) Discuss various techniques for effective presentation.   [6M CO2 BTL3]

3. a) What are verbal and non-verbal communications? Mention some persuasive techniques.
                                                                     [6M CO2BTL3]

   b) Write a user manual for a smart watch.   [6M CO3 BTL3]

4. a) What is mobile etiquette? Explain in detail.   [6M CO4 BTL1]

   b) Define "Agenda" and "Minutes of meeting." Write the purpose of Agenda and Minutes
      of Meeting.   [6M CO4 BTL3]

5. a) Imagine that you purchased an LG Top Load washing machine from online platform
      Amazon. You received a damaged product. Write a complaint letter to the Customer
      Care, Amazon.   [6M CO4 BTL6]

   b) Who writes and reads reports? Explain the elements of effective business reports.
                                                                     [6M CO4 BTL6]

6. a) You would like to open a startup business after your graduation. Prepare your business
      proposal for the same.   [6M CO4 BTL6]

   b) What is report? Write various types of a report in detail.   [6M CO5 BTL2]

7. a) Explain the barriers for effective listening.   [6M CO2 BTL2]

   b) What does 'listening mean'? Explain Active and Passive listening and advantages of
      listening.   [6M CO2 BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (CSE/CME) IV Semester (Main) Examinations-July-2023

Automata Theory Languages and Computation

**Time: 03 Hours**   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same
order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A	6X2=12M

1. a. List the applications of finite automata.   [2M CO1 L1]

   b. Define ε-closure and find the ε closures of all states.   [2M CO1 L1]
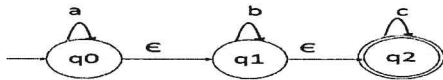
   c. What is Arden's theorem?   [2M CO2 L1]

   d. What is ambiguity in CFG? What are the different methods to remove ambiguity?
                                                                 [2M CO3 L1]

   e. Define Pushdown automata.   [2M CO4 L1]

   f. State post correspondence problem.   [2M CO5 L1]

Part-B	4X12=48M

2. a) Identify the differences between DFA and NFA.   [4M CO1 L3]

   b) Convert NFA to DFA .   [8M CO1 L3]

	0	1
→ p	{p,q}	{p}
q	{r}	{r}
r	{s}	$\emptyset$
*s	{s}	{s}

3. a) Construct a NFA equivalent to the Regular Expression $01^*00(0+1)^*$ [6M CO2 L3]

   b) Define pumping lemma and Show that the language $L=\{a^p: p \text{ is prime}\}$
   is not regular.   [6M CO2 L3]

4. a) Define regular expression write the Regular expression and equivalent Finite automata
   for the following: [6M CO2 L4]

      i. Set of all strings beginning with 1 and ending with 1

      ii. Set of all strings having three consecutive zeros

   b) Define CFG and construct a CFG for the following language. [6M CO3 L3]
      $L= \{a^n b^m \text{ / where } n \neq m\}$

1

5. a) Construct LMD and RMD for the string 'aabbaa' from the grammar. [6M CO3 L3]
   S → aAS / a;
   A→ SbA/ SS /ba

   b) Convert the following CFG to Chomsky normal form. [6M CO3 L3]
   S→0A|1B
   A→0AA| 1S | 1
   B→1BB |0S |0

6. a) Design a pushdown automata which accepts $L = \{wcw^r /w \in (a+b)^*\}$. [6M CO4 L3]

   b) Discuss Types of Turing Machines. [6M CO4 L3]

7. a) Discuss about Recursive and recursively enumerable languages. [6M CO5 L2]

   b) Write short notes on Linear Bounded Automata and context sensitive languages. [6M CO5 L3]

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Stanley College of Engineering & Technology for Women (A)

B.E (AI&DS) IV Semester (Main) Examinations-July-2023

Digital Electronics

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same
   order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Prove that ABC + ABC' + AB'C + A'BC = AB + AC + BC   [2M CO1 BTL3]

   b. Draw the logic diagram of full subtractor and explain.   [2M CO2 BTL3]

   c. Compare the PLD's: PAL and PLA.   [2M CO3 BTL4]

   d. Draw a serial in serial out shift register with initial state 1010 [2M CO4 BTL2]

   e. Compare mealy and moore machine.   [2M CO5 BTL4]

   f. Explain the problem associated with SR latch.   [2M CO4 BTL2]

Part-B   4X12=48M

2. a) Find all the prime implicants for the following Boolean function and determine which
   are essential: $F(A, B, C, D) = \Sigma m\ (2, 3, 4, 5, 6, 7, 9, 11, 12, 13)$
                                                                         [6M CO1 BTL3]

   b) Express the following Boolean expression in canonical product of sums form.
      $F(X,Y,Z)=(XY+Z)(XZ+Y)$ [6M CO1 BTL3]

3. a) Explain the working of 16 X 1Multiplexer with a diagram.   [6M CO2 BTL2]

   b) Design a comparator using combinational gates. The comparator is 2-bit. Comparator
      which compares A(a1,a0) with B(b1,b0) and gives out 3-o/p's A=B, A< B, A>B
                                                                         [6M CO2 BTL3]

4. a) Implement the following two Boolean functions with a PLA: [6M CO3 BTL3]

      $F1(A, B, C) = \sum(0, 3, 5, 6)$
      $F2(A, B, C) = \sum(0, 1, 5, 7)$

   b) Explain the structure of CPLDs with logic diagram   [6M CO3 BTL2]

5. a) Draw the logic diagram of positive edge triggered S-R flip-flop and explain its
      operation with the help of truth table.   [6M CO4 BTL2]

1

P.T.O

b) Design a synchronous counter using D flip-flop that can function as a BCD up counter when the mode control = 0 and when mode control = 1 it gives the count in the sequence as 0,3,6,2,4,9, 7,11, 0,3,6,2.....

[6M CO4 BTL3]

6. a) What is an ASM chart? Explain the difference between state diagram and ASM Chart with an example
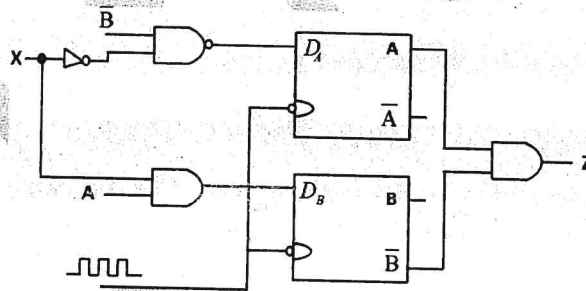
[6M CO5 BTL2]

b) The state table of a digital system shown below. Draw the state diagram.

Preset state	Next state I/P state (x_1, x_2)				output (z) I/P state (x_1, x_2)			
	00	01	10	11	00	01	10	11
A	A	C	A	B	0	-	0	-
B	A	C	B	B	-	-	1	-
C	C	C	D	B	1	0	-	-
D	C	D	D	B	-	1	1	-

[6M CO5 BTL3]

7. a) Write the excitation table and state diagram for the sequential circuit shown in Fig

[6M CO5 BTL3]

b) Perform subtraction on the given unsigned binary numbers using 2's complement of the subtrahend. Where the result should be negative. Find its 2's complement and affix a minus sign:

    i. 10011 – 10001
    ii. 100010 – 100011
    iii. 1001 – 101000
    iv. 110000 – 10101.

[6M CO2 BTL3]

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2

Stanley College of Engineering & Technology for Women (A)

B.E (CME) IV Semester (Main) Examinations-July-2023
Design and Analysis of Algorithms

Time: 03 Hours   Max. Marks-60

Note: i. First Question is Compulsory.Answer any Four out of remaining Six questions.
   ii. Answer to each question must be written at one place only and in the same
       order as they occur in the Question paper.
   iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Rank the order of growth. Compare the order of growth n! and 2^n.   [2M CO1 BTL5]

   b. Recall Assignment problem.   [2M CO2 BTL1]

   c. Distinguish prim's and Kruskal's algorithm.   [2M CO3 BTL2]

   d. Infer the convex hull problem.   [2M CO3 BTL4]

   e. Demonstrate the obstacles in constructing a minimum spanning tree.   [2M CO3 BTL3]

   f. Formulate the steps to search a pattern in the built suffix tree?   [2M CO4 BTL6]

Part-B   4X12=48M

2. a) List out the steps that need to design an algorithm.   [6M CO3 BTL1]

   b) How you will measure input size of algorithm.   [6M CO1,3 BTL1]

3. a) Define a Mathematical analysis of Non-recursive algorithms.   [5M CO1 BTL4]

   b) Tell about the efficiency of finding the element with maximum value in a given Array
      with the help of General plans.   [7M CO1,3 BTL4]

4. Write the algorithm of single source shortest path. Given a graph and a source vertex in the
   graph, find the shortest paths from the source to all vertices in the given graph.
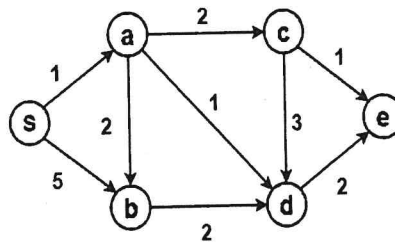
                                                                    [12M CO2,4 BTL5]

5. Generalize the following instance of the 0/1, knapsack problem for given the knapsack
   capacity in W=5 using dynamic programming and explain it.   [12M CO3,4 BTL6]

                                                                    P.T.O

Item	Weight	Value
1	4	$10
2	3	$20
3	2	$15
4	5	$25

6. a) Apply the backtracking concept to solve the 8-Queen problem. [6M CO4 BTL3]

b) Discover the procedures to solve travelling salesman problem. [6M CO4 BTL3]

7. a) Let A= {l/119,m/96,c/247,g/283,h/72,f/77,k/92,j/19} be the letters and its frequency of distribution in a text file. Identify the suitable Huffman coding to compress the data.

[6M CO4 BTL2]

b) Compare the P problem with NP problems. [6M CO3 BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (ECE) IV-Semester (Main) Examinations-July-2023

Integrated Circuits and Applications

Time: 03Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
   ii. Answer to each question must be written at one place only and in the same
       order as they occur in the Question paper.
   iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Explain term Non linear wave shaping and which circuits will come under this
      category.   [2M CO1 L4]

   b. Illustrate Clamping circuit theorem with the help of expression. [2M CO1 L3]

   c. Analyze how the commutating capacitors will increase the speed of a fixed-bias binary.
                                                                        [2M CO2 L4]

   d. Define differential amplifier   [2M CO3 L1]

   e. Op-amp is popular. Comment   [2M CO4 L5]

   f. Draw the functional diagram of IC-555   [2M CO5 L4]

Part-B   4X12=48M

2. a) Explain the effect of diode characteristics on clamping voltage. [6M CO1 L2]

   b) List out the applications of Comparators.   [6M CO1 L1]

3. a) Derive Rise time of a Low Pass RC Circuit.   .   [6M CO1 L4]

   b) Sketch the basic circuit diagram of a two level clipper circuit & explain its operation.
                                                                        [6M CO1 L4]

4. a) Analyze the circuit of Bistable Multivibrator with necessary waveforms.   [6M CO2 L4]

   b) Show how Astable works as Voltage to Time converter with the help of necessary
      derivation and neat diagram.   [6M CO2 L3]

5. a) Explain the DC characteristics of OPAMP.   [6M CO3 L2]

   b) What are different configurations of differential amplifier? Draw the neat-labeled
      diagram for a) dual input, balanced output, b) dual input, unbalanced output and
      c) single input, balanced output   [6M CO3 L5]

6. a) Design first order High Pass filter using OPAMP.   [6M CO4 L2]

   b) Draw the circuit symbol of op-amp. Explain what is mean by inverting input and non-
      inverting input.   [6M CO4 L2]

7. a) Explain Monostable Multivibrator using IC 555.   [6M CO5 L3]

   b) Write short notes on Flash-type A/D converter.   [6M CO5 L3]

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Stanley College of Engineering & Technology for Women (A)

B.E (ECE) IV Semester (Main) Examinations-July-2023

Computer Organization and Architecture

Time: 03Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

### Part-A   6X2=12M

1. a. Distinguish computer organization and architecture.   [2M CO1 BTL2]

   b. Define FETCH and Decode operations.   [2M CO2 BTL1]

   c. Draw the flowchart of Source Initiated Handshaking Transfer Communication.
                                                                             [2M CO3 BTL3]

   d. Distinguish Programmed I/O, Interrupt driven I/O.   [2M CO4 BTL2]

   e. Draw D-RAM memory cell.   [2M CO5 BTL3]

   f. MOV [2050],AX interpret the addressing mode of this instruction.   [2M CO2 BTL3]

Part-B   4X12=48M

2. a) Explain the Bus architecture of Von-Neumann.   [6M CO1 BTL3]

   b) Discuss about Multiplication using Booth's algorithm with an example. [6M CO1 BTL3]

3. a) Describe Micro programmed Control Organization.   [6M CO2 BTL3]

   b) Explain about the instructions with memory operand with examples.   [6M CO2 BTL3]

4. a) Distinguish CISC and RISC processors in detail.   [6M CO3 BTL2]

   b) Explain about the Instruction Pipeline with an example instruction.   [6M CO3 BTL3]

5. a) Describe the differences between Programmed I/O, Interrupt driven I/O. [6M CO4 BTL3]

   b) Explain about DMA master and slave modes.   [6M CO4 BTL3]

6. a) Describe memory hierarchy and explain its advantages.   [6M CO5 BTL3]

   b) Explain about paging concept with an example.   [6M CO5 BTL3]

7. a) List out the advantages of pipelining mechanism.   [4M CO3 BTL1]

   b) Explain about Pipeline and Vector Processing.   [8M CO3 BTL3]

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Hall Ticket No. -   Code: R123745

Stanley College of Engineering & Technology for Women (A)
B.E (ECE) IV Semester (Main) Examinations-July-2023
Signals and Systems

Time: 03Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any four out of remaining six questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Define Unit impulse signal and write its properties.   [2M CO1 BTL1]

   b. Sketch the following signal   [2M CO1 BTL3]
      (i) 2u(t+2)-2u(t-3)   (ii) r(t)+r(t+2)-r(t+1)

   c. State Dirichlett's conditions for Fourier series of a continuous time periodic signal.
                                                                            [2M CO2 BTL1]

   d. Find the Fourier transform of (i) $\delta(n)$ (ii) $\delta(n-k)$?   [2M CO3 BTL3]

   e. Define Initial value and Final value theorem in Laplace transform.   [2M CO4 BTL1]

   f. State sampling theorem.   [2M CO5 BTL1]

Part-B   4X12=48M

2. a) Explain the basic operations that can be performed on continuous- time signal with an
      example.   [6M CO1 BTL2]

   b) Comment about linearity, Causality and time invariance of the system   [6M CO1 BTL5]

      $$y(t) = 2x(t+1) -x(t-1)^2$$

3. a) Obtain the trigonometric Fourier Series for the waveform shown in figure below.
                                                                            [7M CO2 BTL3]
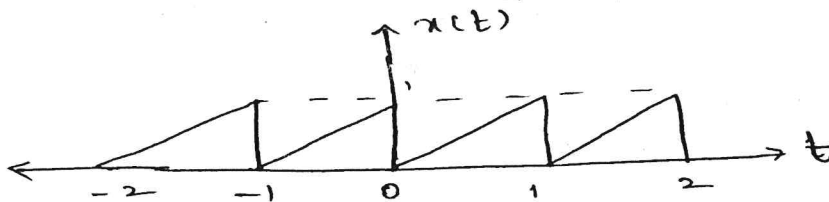
   b) Show that the functions $\sin(nw_0t)$ and $\cos(nw_0t)$ are orthogonal over any interval
      $\{ t_0, t_0+(2\pi/w_0)\}$ [5M CO2 BTL3]

4. a) Find the Fourier transform of the following signals using properties.   [6M CO3 BTL3]

      (i) $x(t) = e^{-at}u(t)$

      (ii) $x(t) = \delta(t+2)+\delta(t+1)+\delta(t-1)$

      (iii) $x(t) = e^{-2t}[u(t)-u(t-5)]+\delta(t-2)$

1

                                                                            P.T.O

b) Find DTFT of the following   [6M CO3 BTL3]

   (i) x(n) = {1,-2,2,3}   (ii) x(n) = $(1/2)^{n-2}u(n-2)$

5. a) The input and output of a Causal LTI system is described by   [6M CO4 BTL3]

   $d^2y/dt^2+5dy/dt+6y(t) = x(t)$. Find the impulse response of the system

   b) Find the inverse Laplace transform of   [6M CO4 BTL3]

   $X(S) = S/(S^2+a^2)^2$

6.a) Find the Z-transform of the following sequences   [6M CO5 BTL3]

   (i) x(n) = u(n)-u(n-4)   (ii) x(n) = {-1,-2,-3,1,2,3}

   b) Determine the Convolution Sum of the following sequence   [6M CO5 BTL3]

   (i) x(n) = {1,2,-1,3}   (ii) x(n) = {0,1,2,-1}

   h(n) = {1,2,0,-2}   h(n) = {-1,2,1,3}

7.a) Obtain the exponential Fourier series for the waveform shown in figure below

                                                                            [8M CO2 BTL3]
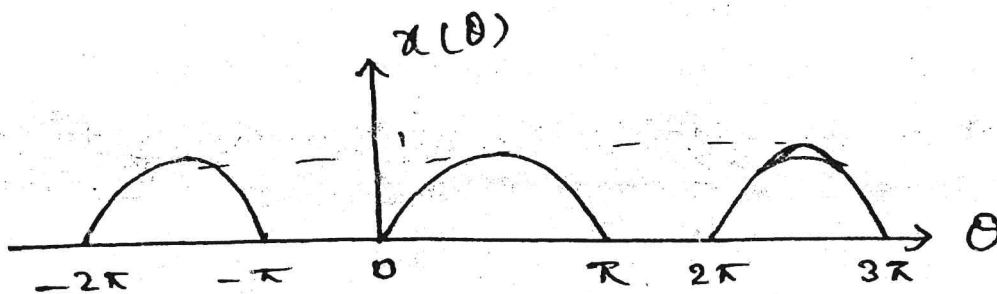
   b) Find the Fourier transform of the signum function   [4M CO3 BTL3]

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2

Stanley College of Engineering & Technology for Women (A)

B.E (ECE) IV Semester (Main) Examinations-July-2023

Antennas and Wave Propagation

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining SIX questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1 a. Define the terms as applicable to antennas
(a) Beam width and (b) Beam area   [2M, CO1, BTL1]
  b. Differentiate between half-wave dipole and quarter wave monopole   [2M, CO2, BTL2]

  c. Discuss the role of Reflector, Dipole and Director in Yagi-Uda antenna   [2M, CO3, BTL1]
  d. Discuss the types of horn antennas   [2M, CO3, BTL2]

  e. Discuss few Radiation Hazards   [2M, CO4, BTL2]

  f. Describe Line of sight propagation   [2M, CO5, BTL1]

Part-B   4X12=48M

2. a. Explain the effective length and effective area of the antenna.   [6M, CO1, BTL2]

  b. For an antenna radiating with radiation intensities of (i) $2\cos\theta$ (ii) $2\cos3\theta$. Estimate the directivities of the antenna.   [6M, CO1, BTL2]

3. a. Analyse mathematically the far field pattern of circular loop with uniform current   [6M, CO2, BTL3]

  b. Describe the practical design considerations for monofilar helical antenna   [6M, CO2, BTL4]

4. a. Describe the construction of a pyramidal horn and draw its radiation pattern   [6M, CO3, BTL3]

  b. Discuss the properties of parabolic reflector antennas with centre fed and cassegrain feed types and show that the gain of the same is $G = 6:0 (D/\lambda)^2$ [6M, CO3, BTL4]

5. a. Derive an expression for the radiation field of an 'n' element linear array with spacing 'd'.   [6M, CO4, BTL3]

1

P.T.O

b. Compare the performance & properties of `n' element linear arrays and binomial arrays of `n' elements. [6M, CO4, BTL4]

6. a. Determine the field due to array of two point sources of same amplitude and opposite phase at a distance 'R'. [6M, CO4, BTL3]

b. Describe the neat set up for measuring the gain of an antenna. [6M, CO4, BTL4]

7. a. A radio link has a 15W transmitter connected to an antenna of $2.5m^2$ effective aperture at 5GHz. The receiving antenna has an effective aperture of 0.5 m^2 located at a 15Km LOS distance from the transmitting antenna. Assuming lossless, matched antennas, find the power delivered to the receiver [6M, CO5, BTL2]

b. Explain refraction and reflection of sky waves by ionosphere [6M, CO5, BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (ECE) IV Semester (Main) Examinations-July-2023
Analog Electronic Circuits

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory.Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

|			
1	a.	Interpret major difference between a BJT and JFET amplifiers?	[2M CO1 BTL1]
	b.	Define the parameters. Gain, Bandwidth, i/p & o/p impedance of ideal amplifier	[2M CO2 BTL2]
	c.	Explain the concept of Barkhausen criteria	[2M CO3 BTL2]
	d.	Differentiate between Class-A, B, AB, C & D amplifiers	[2M CO4 BTL2]
	e.	Explain the harmonic distortion in power amplifiers	[2M CO4 BTL1]
	f	Write the relation between gain and bandwidth product	[2M CO1BTL1]

Part-B   4X12=48M

2	a.	If an amplifier with gain of - 1000 and feedback factor $\beta = -0.1$ had a gain change of 20% due to temperature, determine the change in gain of the feedback amplifier	[6M CO2 BTL3]
	b.	Describe the analysis of single stage RC coupled amplifier	[6M CO1 BTL4]
3	a.	Discuss the effect of negative feedback on input and output impedances	[6M CO2 BTL4]
	b.	Discuss the general characteristics of negative feedback	[6M CO2 BTL3]
4	a.	Analyze how negative and positive feedback is enhanced in amplifiers with a neat diagram	[6M CO3 BTL4]
	b.	Describe the working model of Wein-bridge oscillator. And mathematically formulate the condition for oscillation.	[6M CO3 BTL3]
5	a.	The Hartley Oscillator circuit having two individual inductors of 0.5mH each is designed to resonate in parallel with a variable capacitor that can be adjusted between 100pF and 500pF. Determine the upper and lower frequencies of oscillation and also the Hartley oscillator's bandwidth.	[6M CO3 BTL3]

1

b. A Colpitts Oscillator having two capacitors of 24nF and 240nF [6M CO3 BTL3] respectively are connected in parallel with an inductor of 10mH. Determine the frequency of oscillations of the circuit
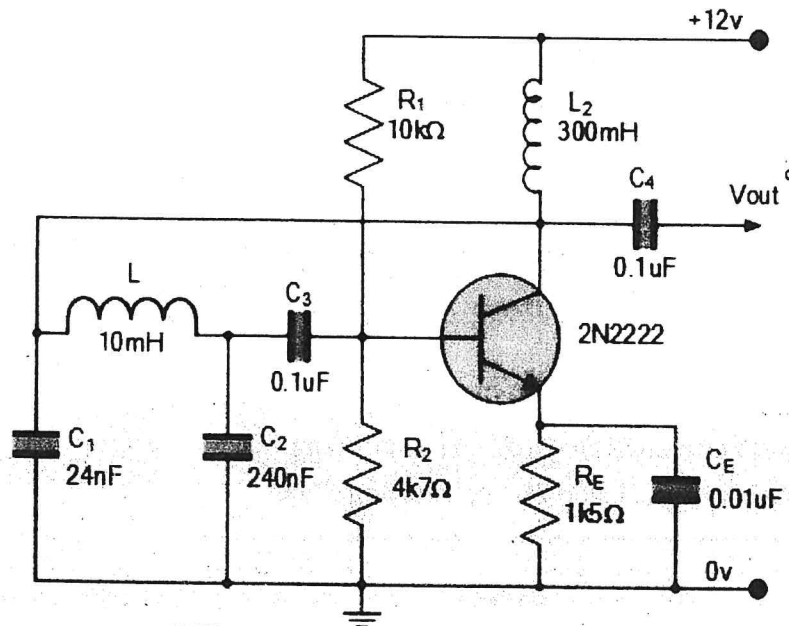
6 a. Describe the working model of transformer coupled class A amplifier [6M CO4 BTL3] and find its efficiency

b. Describe the working model of class B push pull amplifier and [6M CO4 BTL3] calculate its efficiency

7 a. Design a single tuned amplifier circuit for 5KHz [6M CO5 BTL4]

b. Describe how selectivity, gain and bandwidth can be improved in [6M CO5 BTL3] single tuned and double tuned amplifiers

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2

Stanley College of Engineering & Technology for Women (A)

B.E (IT) IV Semester (Main) Examinations-July-2023
Fundamentals of Digital Image Processing

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
   ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
   iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. What do you meant by Gray level?   [2M, CO1, BTL1]

    b. Analyze the need of color image processing.   [2M, CO1, BTL4]

    c. Write the equations for discrete Fourier transform for one-dimensional and two-dimensional function.   [2M, CO2, BTL1]

    d. What is image negative?   [2M, CO3, BTL2]

    e. Compare image enhancement and restoration techniques.   [2M, CO4, BTL4]

    f. Distinguish lossless and lossy compression.   [2M, CO5, BTL4]

Part-B   4X12=48M

2. a) Explain by drawing diagram fundamental steps in image processing.   [6M, CO1, BTL1]

   b) Illustrate the concept of neighbors of a pixels and adjacency.   [6M, CO1, BTL2]

3. a) Determine the Kernel coefficient of slant transform for N=4.   [7M, CO2, BTL3]

   b) What are the properties and advantages of Haar Transform?   [5M, CO2, BTL2]

4. a) Analyze the expressions in the histogram equalization technique for image enhancement.   [6M, CO3, BTL4]

   b) Explain the following order static filters
      i) Median filter   ii) Min and max filter.   [6M, CO3, BTL2]

5. a) Explain model of image degradation/restoration process with a block diagram.   [6M, CO4, BTL2]

   b) How Wiener filtering is helpful to reduce the mean square error?   [6M, CO4, BTL4]

6. a) Explain how to detect discontinuities in image segmentation.   [5M, CO5, BTL4]

   b) Define image compression. Explain about the redundancies in a digital image.   [7M, CO5, BTL3]

7. a) List out different color models in color image processing and discuss about pseudo color image processing.   [6M, CO1, BTL2]

   b) With necessary plots explain the following intensity transformation techniques:
      i) Gray level slicing   ii) Logarithmic transformation   [6M, CO3, BTL3]

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Stanley College of Engineering & Technology for Women (A)

B.E (IT) IV Semester (Main) Examinations-July-2023
Theory of Automata

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. How to check acceptance of string by finite automata?   [2M CO2 BTL1]

   b. What is a Regular expression in the theory of Automata?   [2M CO3 BTL1]

   c. For the Grammar {S→AS/a, A→SbA/SS/ba} construct Left most derivation for the string aabbaaa.   [2M CO3 BTL6]

   d. Write about the model of Push Down Automata.   [2M CO4 BTL1]

   e. What is Turing machine halting problem?   [2M CO5 BTL1]

   f. Why is chomsky hierarchy important? Draw a neat sketch.   [2M CO5 BTL1]

Part-B   4X12=48M

2. a) Show with an example equivalence between NFA with and without ϵ- transitions.

                                                                       [6M CO1 BTL4]

   b) Define NFA mathematically. Explain its significance and function. Convert the given Finite automaton into its Deterministic equivalence. Explain method used. Taking suitable example and prove both accept the same string.
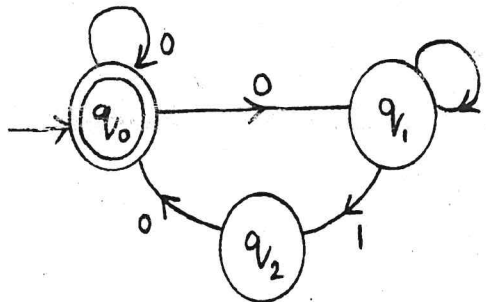
                                                                       [6M CO1 BTL4]

3. a) Construct a DFA for the Regular Language consisting of any number of a's and b's.
[5M CO2 BTL5]

   b) What is a regular language? Convert the given regular expression to regular language.
   i) $(1+\epsilon)(00*1)0*$
   ii) $(0*1*)000(0+1)*$
   iii) $(00+10)*1*(10+00)*$

[7M CO2 BTL3]

4. a) Define Context Free Grammar. State and Explain the closure properties of CFG.
[5M CO2 BTL3]

   b) Define Ambiguous Grammar? Check whether the grammar S ->Aab, A -> Bc/cd, C -> cd, B -> c/d Is Ambiguous or not?
[7M CO4 BTL3]

5. a) Define Push Down Automata. Explain the basic structure of PDA with a neat Graphical representation.
[6M CO4 BTL3]

   b) Why the Languages accepted by Turing machine are called "recursively enumerable languages". Explain at least two Closure properties of recursively enumerable languages.
[6M CO4 BTL3]

6. a) Explain in detail about PCP with examples.
[7M CO4 BTL1]

   b) How can the Halting problem of Turing machine be Handled? Explain. [5M CO4 BTL3]

7. Construct a context free grammar for a given language and construct the PDA for the same L={ 0^n 1^n / n >=1}
[12M CO4 BTL3]

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Stanley College of Engineering & Technology for Women (A)

B.E (IT) IV Semester (Main) Examinations-July-2023
Computer Organization and Microprocessor

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory.Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. What is Fixed-point representation?   [2M CO1BTL1]

   b. Give examples of Address Sequence.   [2M CO2 BTL1]

   c. Write the advantage of RISC over CISC?   [2M CO3 BTL3]

   d. Define an I/O processor.   [2M CO4 BTL1]

   e. List out functions of DMA.   [2M CO5 BTL1]

   f. What is ADC? Give an example.   [2M CO5 BTL1]

Part-B   4X12=48M

2. a) Discuss the bus and memory transfer.   [4M CO1 BTL4]

   b) What is register transfer language? Explain the basic symbols used in register transfer.
                                                            [8M CO1 BTL3]

3. a) Explain the instruction cycle with the help of a flow chart.   [6M CO1 BTL2]

   b) How to design the control unit? Explain.   [6M CO2 BTL6]

4. a) What is virtual memory? With a neat block diagram explain the virtual memory address translation.   [6M CO3 BTL5]

   b) Briefly explain the floating-point arithmetic operations with examples.   [6M CO3 BTL3]

5. a) Why does DMA have priority over the CPU when both request a memory transfer?
                                                            [4M CO5 BTL2]

   b) What are addressing modes? Explain different types of addressing modes with examples.
                                                            [8M CO3 BTL3]

6. a) Discuss the architecture of the 8051 microcontrollers.   [8M CO5 BTL4]

   b) Explain the features of multi core processors.   [4M CO3 BTL2]

7. a) Write a short note on GPUs.   [6M CO4 BTL2]

   b) Explain the Programmable Interrupt Controller 8259. [6M CO5 BTL3]

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Stanley College of Engineering & Technology for Women (A)

B.E (IT) IV Semester (Main) Examinations-July-2023

Techniques on Signals and Systems

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
　　　　ii. Answer to each question must be written at one place only and in the same
　　　　　　order as they occur in the Question paper.
　　　　iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Sketch the following signal $x(T) = u(t+1) - 2u(t) + u(t-1)$ [2M CO1 BTL2]

   b. State the Parseval's power theorem of Fourier series.   [2M CO2 BTL1]

   c. Find the Fourier transform of signal $x(t) = 5sin^2 3t$ [2M CO2 BTL3]

   d. Determine the DTFT of the sequence $x(n) = 0.5^n u(n)$ [2M CO2 BTL3]

   e. Define Region of Convergence. Also, state any two properties of the Region of
      convergence with respect to Z Transform.   [2M CO4 BTL1]

   f. Determine whether the following system is stable $h(t) = te^{-t}u(t)$ [2M CO3 BTL4]

Part-B   4X12=48M

2. a) Categorize the given signal as Energy or Power Signal
$$x(t)3[u(t) - u(t-5)]$$ [6M CO1BTL4]

   b) For the signal shown in Fig.1, sketch the following: [6M CO1 BTL3]
      (i) g(2t – 2)   (ii) even part of g(t)   (iii) odd part of g(t)
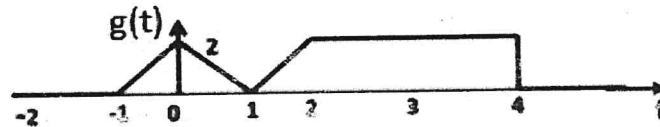
3. a) Consider a rectified sine wave signal x (t) defined by   [6M CO1 BTL3]
$$x(t) = |Asin\Pi t|$$
   i)   Sketch x (t) and find its fundamental period.
   ii) Find the complex exponential Fourier series of x(t)

   b) State the Dirichlet conditions of Fourier series.   [6M CO2 BTL1]

4. a) State and prove Frequency differentiation and Frequency shift properties of Fourier
      transforms.   [7M CO2 BTL2]

   b) Interpret the Fourier Transform of the signal using appropriate properties.
$$x(t) = e^{-2t} \sin(\Pi t) u(t)$$ [5M CO2 BTL5]

1

5. a) Find the inverse Laplace transform of the following function　　　　[6M CO3BTL3]

$$F(s) = \frac{s+1}{(s+1)^2 + 4}$$

b) A Laplace transform is characterized by the differential equation　　　[6M CO3 BTL6]

$$\frac{d^2}{dt^2} y(t) + \frac{5dy(t)}{dt} + 6y(t) = x(t)$$

Solve for y(t) for $t \geq 0$ when x(t) = u(t) $y(0^-) = 2$ and $\frac{dy(0^-)}{dt} = -12$

6. a) List any three properties of Laplace Transform.　　　　　　　　　[5M CO3 BTL1]

b) State and Prove the following properties of DFT　　　　　　　　　　[7M CO2 BTL2]

　　i) Multiplication in time domain　　ii) Complex conjugate

7. a) Simplify the given function and calculate the inverse Z-transform　　[6M CO4BTL4]

$$X(z) = \frac{z}{3z^2 - 4z + 1} \qquad \text{for the ROCs}$$

i)　　　$|z| > 1, |Z| < \frac{1}{3}$

ii)　　$\frac{1}{3} < |z| < 1$

b) A system is described by the difference equation LTI　　　　　　　　[6M CO3BTL3]

$$y(n) - \frac{3}{4} y(n-1) + \frac{1}{8} y(n-2) = x(n)$$

　　i)　　Find the transfer function of the system.
　　ii)　　Find the impulse response of the system h(n)
　　iii)　Find the step response of the system s(n)

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Hall Ticket No. -   Code: R123746

Stanley College of Engineering & Technology for Women (A)

B.E (EEE) IV Semester (Main) Examinations-July-2023

Electrical Machines-I

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining six questions.
  ii. Answer to each question must be written at one place only and in the same
        order as they occur in the Question paper.
  iii. Missing data, if any, may be suitably assumed.

Part-A	6X2=12M

1. a. Explain the processes of Electro Mechanical energy conversion.   [2M CO1 BTL2]

   b. Define the terms of critical resistance and critical speed.   [2M CO2 BTL1]

   c. What is the back e.m.f or counter voltage?   [2M CO3 BTL1]

   d. Define voltage regulation of a transformer.   [2M CO4 BTL1]

   e. What is the condition for maximum efficiency of a transformer?   [2M CO5 BTL1]

   f. What happens when a DC supply is applied to a Transformer?"   [2M CO1 BTL1]

Part-B	4X12=48M

2. a) Derive the expressions for singly excited systems.   [6M CO1 BTL6]

   b) Write a short note on energy balance equation in motor.   [6M CO1 BTL1]

3. a) Explain how the voltage is developed in a self-excited D.C shunt generator?
                                                                              [6M CO2 BTL2]

   b) Draw the construction of DC generator and explain its parts briefly.   [6M CO2 BTL6]

4. a) Explain the Speed control of d.c. Motors using Armature voltage and field flux control
      methods.   [6M CO3 BTL2]

   b) Describe the brake test on DC motor to determine the performance characteristics of DC
      motor.   [6M CO3 BTL1]

5. a) Why transformer rating is in kVA not in kW? A 230 V, 2.5 kVA single –phase
      transformer has an iron loss of 100W at 40-Hz and 70 W at 30-Hz.Find the hysteresis
      and eddy current losses at 50 –Hz.   [8M CO4 BTL1]

   b) Derive the condition for maximum efficiency in transformer.   [4M CO4 BTL6]

6. a) Mention the different types of three phase transformer connection and explain them
      briefly with neat diagrams.   [6M CO5 BTL3]

   b) What is an auto-transformer? What advantages are possessed by auto-transformers?
                                                                              [6M CO5 BTL1]

7. a) What will happen to the speed of DC motor when its flux approaches zero?
                                                                              [4M CO3 BTL1]

   b) Draw the circuit model of various types of DC motors. A 220-V d.c machine has an
      armature resistance of 0.5 Ω. If the full-load armature current is 20 A, find the induced
      e.m.f . when the machine acts as a motor.   [8M CO3 BTL1]

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Stanley College of Engineering & Technology for Women (A)

B.E (EEE) IV Semester (Main) Examinations-July-2023

Switching Theory and Logic Design

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory.Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same
order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Obtain complement and dual for the given expression (AB+BC+AC) (EF)
[2M CO1 BTL6]

   b. Draw the diagram of subtractor using truth tables.   [2M CO1 BTL4]

   c. What is race around condition in JK flip-flop?   [2M CO3 BTL3]

   d. Write the purpose of parallel comparator A/D converter   [2M CO4 BTL1]

   e. Differentiate between EPROM and EEPROM.   [2M CO5 BTL2]

   f. How a D-flip flop obtained from JK flip flop? Write its truth table.   [2M CO5 BTL1]

Part-B   4X12=48M

1. a) Implement the following function using only NOR gates F=a. (b+ c.d) + (b.. c).
[6M CO1 BTL3]

   b) Implement the following function using only NAND gates Gv= (a + b). (c. d + e)
[6M CO1 BTL3]

2. a) Design a full-adder with two half-adders and basic gates.   [6M CO2 BTL4]

   b) Convert Excess-3 code to BCD using Full adder circuits.   [6M CO2 BTL5]

3. a) Differentiate between asynchronous and synchronous sequential circuit. Also
design MOD 5 asynchronous counter using JK flip flop.   [6M CO3 BTL2]

   b) Draw the logic diagram of a SR latch using NOR gates. Explain its Operation
using excitation table.   [6M CO3 BTL4]

4. a) Discuss the successive approximation analog to digital converters.   [7M CO4 BTL3]

   b) Write the specifications and examples of analog to digital converters   [5M CO4 BTL1]

5 a) Design a BCD to Excess-3 code converter using a PROM.   [7M CO5 BTL6]

   b) Give the comparison between PROM, PLA and PAL.   [5M CO5 BTL5]

6. Simplify the following Boolean expressions using K-map and implement it by using
NOR gates.
a) F (A, B, C, D) = AB'C' +AC+A'CD'.   [6M CO2 BTL4]

   b) F (W, X, Y, Z) = w' x'y'z' + wxy'z' + w'x'yz + wxyz.   [6M CO2 BTL4]

7. a) Explain M Method of function realization.   [7M CO3 BTL2]

   b) Write the difference between combinational circuit and sequential circuit. [5M CO3 BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (EEE) IV Semester (Main) Examinations-July-2023

Control Systems

Time: 03Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
        ii. Answer to each question must be written at one place only and in the same
            order as they occur in the Question paper.
        iii. Missing data, if any, may be suitably assumed.

	Part-A	**6X2=12M**

1. a.   List the advantages and disadvantages of open loop system and closed loop system?   [2M CO1 BTL1]

   b.   Write the analogous electrical elements in force-voltage analogy for the elements of mechanical translational system?   [2M CO1 BTL1]

   c.   Find the transfer function of the system whose step response is a unit impulse function?   [2M CO2 BTL2]

   d.   Explain gain margin and phase margin of the control system?   [2M CO3 BTL2]

   e.   Draw the pole zero plot of lead compensator and lag compensator?   [2M CO4 BTL1]
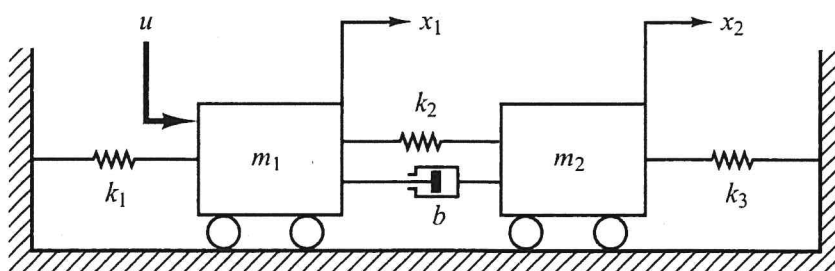
   f.   Explain the concept of state?   [2M CO5 BTL2]

	Part-B	**4X12=48M**

2. a.   Find the transfer function $C(s)/R(s)$ for the figure shown below?   [6M CO1 BTL2]
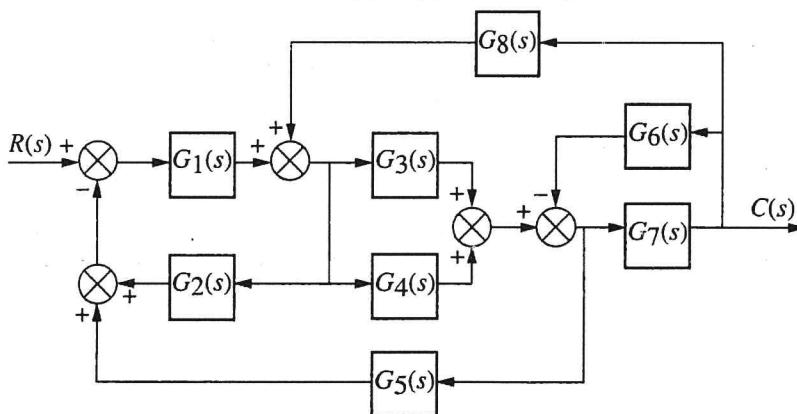
   b.   Obtain the transfer functions $X_1(s)/U(s)$ and $X_2(s)/U(s)$ of the mechanical system shown in figure below?   [6M CO1 BTL2]

1

3. a. A unity feedback control system has an open loop transfer   [6M CO2 BTL3]
function $G(s) = \frac{10}{s(s+2)}$. Calculate the damping ratio, undamped
natural frequency of oscillations of the system, rise time, peak time,
settling time and percentage peak overshoot for a unit step input?

   b. What is Step Response? Explain Time Domain Specifications.   [6M CO2 BTL1]

4. The open loop transfer function of a control system is given by   [12M CO3 BTL4]
$$G(s)H(s) = \frac{K}{s(s+8)(s^2+2s+5)}$$
Sketch the root locus plot and determine, (i) the break-away points,
(ii) the angle of departure from complex poles and (iii) condition for
stability?

5. a. Comment on the range of phase margin and gain margin for the   [4M CO4 BTL1]
following stability conditions of the control system
   i) Unstable
   ii) Marginally stable
   iii) Absolutely stable
   iv) Conditionally stable

   b. Sketch the Bode plot for the following transfer function   [8M CO4 BTL4]
$$G(s)H(s) = \frac{8}{s(1+0.3s)(1+0.1s)}$$
Determine the following of the system
   i) Gain crossover frequency
   ii) Phase crossover frequency
   iii) Gain margin and
   iv) Phase margin

6. Evaluate the observability of the state space representation of   [12M CO5 BTL5]
the system given below?
$$\begin{bmatrix} \dot{x_1} \\ \dot{x_2} \\ \dot{x_3} \end{bmatrix} = \begin{bmatrix} -1 & -2 & -2 \\ 0 & -1 & 1 \\ 1 & 0 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 2 \\ 0 \\ 1 \end{bmatrix} u$$
$$y = \begin{bmatrix} 1 & 1 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

7. a. Draw lag-lead compensator and derive its transfer function?   [6M CO4 BTL2]

   b. What are the properties of state transition matrix? Compute state   [6M CO5 BTL6]
transition matrix.

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Stanley College of Engineering & Technology for Women (A)
B.E (EEE) IV Semester (Main) Examinations-July-2023
OOPs Using Java

Time: 03 Hours   Max. Marks-60

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
         ii. Answer to each question must be written at one place only and in the same
            order as they occur in the Question paper.
         iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. List the benefits of object-oriented development.   [2M CO1 BTL1]

   b. Define Inheritance.   [2M CO2 BTL1]

   c. Illustrate the use of string tokenizer.   [2M CO3 BTL2]

   d. List out AWT classes.   [2M CO4 BTL1]

   e. Write about Files.   [2M CO5 BTL2]

   f. Define package.   [2M CO2 BTL1]

Part-B   4X12=48M

2. a) Explain in detail object oriented concepts.   [6M CO1 BTL5]

   b) Write about variables and arrays with example.   [6M CO1 BTL2]

3. a) Discuss about classes and methods   [6M CO2 BTL6]

   b) Explain Exception Handling with example program.   [6M CO2 BTL2]

4. a) Describe any three Collection Classes.   [6M CO3 BTL2]

   b) Explain any three Legacy classes with example.   [6M CO3 BTL2]

5. a) Explain in detail Two Event Handling Mechanisms.   [6M CO4 BTL2]

   b) Discuss about Labels, Buttons and Check Boxes with example program.   [6M CO4 BTL6]

6. a) Explain Files with example program in java.   [6M CO5 BTL2]

   b) Explain the Serialization and Deserialization concepts in detail.   [6M CO5 BTL2]

7. a) List out and explain Layout managers in AWT.   [6M CO4 BTL1]

   b) Explain Operators in detail.   [6M CO1 BTL2]

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Stanley College of Engineering & Technology for Women (A)

B.E (CSE/CME/EEE) IV Semester (Main) Examinations -July-2023

Effective Technical Communication

Time: 03 Hours   **Max. Marks-60**

Note: i. First Question is Compulsory. Answer any Four out of remaining Six questions.
ii. Answer to each question must be written at one place only and in the same order as they occur in the Question paper.
iii. Missing data, if any, may be suitably assumed.

Part-A   6X2=12M

1. a. Explain any TWO barriers for communication.   [2M CO1 BTL 1]

   b. What is the process of communication?   [2M CO2 BTL1]

   c. Explain any TWO types of listening skills.   [2M CO3 BTL1]

   d. What is kinesics?   [2M CO4 BTL2]

   e. Write about the purpose of user manual.   [2M CO5 BTL2]

   f. Write advantages of an Email.   [2M CO4 BTL3]

Part-B   4X12=48M

2. a) Explain various barriers for technical communication.   [6M CO1 BTL2]

   b) Discuss various techniques for effective presentation.   [6M CO2 BTL3]

3. a) What are verbal and non-verbal communications? Mention some persuasive techniques.
                                                               [6M CO2BTL3]

   b) Write a user manual for a smart watch.   [6M CO3 BTL3]

4. a) What is mobile etiquette? Explain in detail.   [6M CO4 BTL1]

   b) Define "Agenda" and "Minutes of meeting." Write the purpose of Agenda and Minutes of Meeting.   [6M CO4 BTL3]

5. a) Imagine that you purchased an LG Top Load washing machine from online platform Amazon. You received a damaged product. Write a complaint letter to the Customer Care, Amazon.   [6M CO4 BTL6]

   b) Who writes and reads reports? Explain the elements of effective business reports.
                                                               [6M CO4 BTL6]

6. a) You would like to open a startup business after your graduation. Prepare your business proposal for the same.   [6M CO4 BTL6]

   b) What is report? Write various types of a report in detail.   [6M CO5 BTL2]

7. a) Explain the barriers for effective listening.   [6M CO2 BTL2]

   b) What does 'listening mean'? Explain Active and Passive listening and advantages of listening.   [6M CO2 BTL2]

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