

Sixth Semester B.E Makeup Examination, Sept._Oct._2020**OBJECT ORIENTED MODELING AND DESIGN**

Time: 3 hrs

Max. Marks :100

Instructions :1. Answer any Five full Questions selecting at least One Full Question from Each Unit. 2. Each Question carry Equal Marks. 3. Missing Data may be suitably assumed. 4. Draw Figures wherever necessary.

MODULE 1

- 1a. Describe the themes of Object Oriented technology [2] [1] [2] [6]
- 1b. Explain the three models of object oriented development and explain the relationship between them [2] [1] [2] [6]
- 1c. Design a complete class diagram for the problem statement: A company consists of departments. Departments are located in one or more offices. One office acts as a headquarter. Each department has a manager who is recruited from the set of employees. Your task is to model the system for the company. Note: Apply domain knowledge wherever needed. [3] [1] [3] [8]

OR

- 2a. Describe the object oriented methodology for software development. [3] [1] [1] [6]
- 2b. Design a complete class diagram for the problem statement: An online hotel room booking System should support a customer to book a room of any type by making payments through either using the debit card or credit card. The customer should have the provision for choosing and canceling the room of interest. [3] [1] [3] [8]
- 2c. Explain the concept of Inheritance and generalization. Apply the same to draw the family tree till 3 levels of generation starting from your generation [3] [1] [1] [6]

MODULE 2

- 3a. Design a state diagram for a typical telephone line showing all the states and events in it. [3] [2] [3] [8]
- 3b. List and explain the behaviors of state diagram with an examples for each. [2] [2] [2] [8]
- 3c. Differentiate the events and guard condition with an example. [4] [2] [2] [4]

OR

- 4a. Explain with examples representation of the concurrent state in state modeling. [2] [2] [2] [6]
- 4b. List and explain the three types of state modelling events with an example for each. [2] [2] [2] [6]
- 4c. Design the state diagram for a postal card delivery using speed post services. Show at least 5 or more states. [6] [2] [2] [8]

MODULE 3

- 5a. Design an Activity model and explain the process for an ATM problem statement: The customer can perform various transactions using ATM card. Before conducting any transactions the customer should be validated and then a session should be initiated. The

Fifth Semester B.E. Fast Track Semester End Examination, July/August 2019

UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. *UNIT I and UNIT II are compulsory. Answer at least five questions by selecting at least one question from each other UNIT.*
 2. *Draw the figure/ diagram compulsorily wherever necessary.*

		UNIT - I (Compulsory)		L	CO	PO	M
1	a.	Differentiate the KR-C with ANSI C.		(3)	(1)	(1)	(10)
	b.	List and explain at least 5 compile time and runtime limit checking macros.		(2)	(1)	(1)	(10)
UNIT - II (Compulsory)		L	CO	PO	M		
2	a.	Explain the different file types as supported by UNIX operating systems.		(2)	(1)	(1)	(10)
	b.	Demonstrate the UNIX kernel support for files.		(3)	(1)	(2)	(10)
UNIT - III		L	CO	PO	M		
3	a.	Write a note on memory layout of a C Program		(2)	(1)	(2)	(10)
	b.	Elucidate on UNIX kernel support for processes.		(2)	(1)	(1)	(10)
OR							
4	a.	Demonstrate the use of setjmp and longjmp functions along with a C program		(3)	(1)	(3)	(10)
	b.	What are environment variables? Write a C program to query them using any of the three methods		(3)	(1)	(3)	(10)
UNIT - IV							
5	a.	Write a note on UNIX kernel support for SIGNALS		(2)	(3)	(1)	(10)
	b.	Explain the WAITPID API along with a sample C program		(2)	(3)	(1)	(10)
OR							
6	a.	What is a daemon process? Explain the error logging facility of Daemon processes.		(2)	(3)	(1)	(10)
	b.	Demonstrate the sigsetjmp and siglongjmp functions with an example		(3)	(3)	(1)	(10)
UNIT - V		L	CO	PO	M		
7	a.	What are pipes in UNIX? Write a C program to demonstrate its use for client server communication		(2)	(2)	(3)	(10)
	b.	Explain popen and pclose functions as applicable to IPC's in UNIX.		(2)	(2)	(3)	(10)
OR							
8	a.	Demonstrate the use of message queues using API's		(3)	(2)	(1)	(10)
	b.	Demonstrate the use of semaphores using API's to manipulate them.		(2)	(2)	(1)	(10)

Fifth Semester B.E. Fast Track Semester End Examination, July/August 2019
FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 Hours

Max. Marks: 100

- Instructions:** 1. UNIT I & V are Compulsory.
 2. Answer any one full question from remaining each UNITS.

UNIT - I (Compulsory)

- 1 a. Define the following with examples.
 i) Alphabet ii) String iii) Language (1) (1) (12) (05)
- b. Design DFA for the following:
 i) To accept the strings of a's and b's ending with 'ab'.
 ii) $L = \{ w \text{ such that } |w| \bmod 3 = 0, w \in \{a,b\}^* \}$ (3) (1) (3) (08)
- c. Design an NFA to accept the strings of 0's and 1's that end with 10. Convert the same NFA to DFA. (3) (1) (3) (07)

UNIT - II

- 2 a. Define regular expression. Write regular expression for following:
 i) $L = \{ 0^n 1^m \mid (m+n) \text{ is even} \}$
 ii) Strings of 0's and 1's whose 2nd symbol from the end is 0. (3) (2) (2) (05)
- b. Show that the language $L = \{ a^n b^n \mid n \geq 1 \}$ is not regular. (3) (3) (1) (05)
- c. Minimize the following DFA using table-filling algorithm.

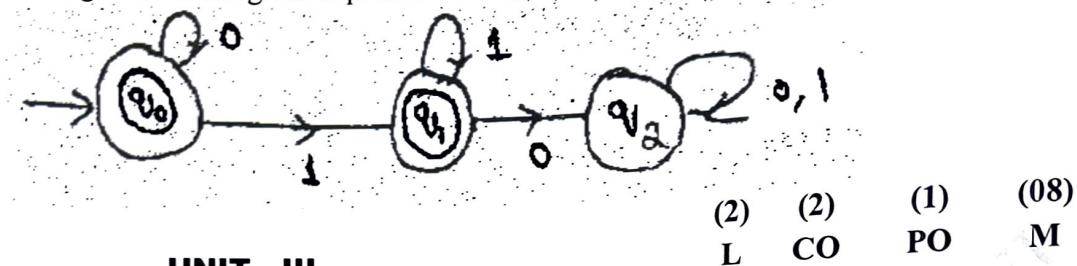
δ	0	1
-->A	B	F
B	G	C
*C	A	C
D	C	G
E	H	F
F	C	G
G	G	E
H	G	C

(3) (2) (3) (10)

OR

- 3 a. Write regular expression for the following:
 i) $L = \{ a^n b^m \mid n \geq 4, m \leq 3 \}$
 ii) $L = \{ a^{2n} b^{2m+1} \mid m \geq 0, n \geq 0 \}$ (3) (2) (2) (05)
- b. State and prove pumping lemma for regular languages. (3) (3) (1) (07)

- c. Translate the following DFA to a regular expression using state-elimination method.



UNIT - III

- 4 a. Define context-free-grammar(CFG). Construct the CFG for the following languages:
 i) $L = \{ w \mid w \in (a+b)^*ab \}$ ii) $L = \{ a^n b^n \mid n \geq 0 \}$
 (3) (2) (2) (06)
- b. Write LMD, RMD and parse tree for the string '+*-xyxy' using the grammar:
 $E \rightarrow +EE \mid *EE \mid -EE \mid x \mid y$
 (3) (2) (2) (08)
- c. Illustrate the applications of CFG.
 (2) (2) (12) (06)

OR

- 5 a. Define ambiguous grammar. Show that the following grammar is ambiguous for the string 'aab'.
 $S \rightarrow AB \mid aaB$
 $A \rightarrow a \mid Aa$
 $B \rightarrow b$
 (2) (3) (2) (05)
- b. Define CNF. Convert the following grammar into CNF.
 $S \rightarrow 0A \mid 1B$
 $A \rightarrow 0AA \mid 1S \mid 1$
 $B \rightarrow 1BB \mid 0S \mid 0$
 (3) (3) (3) (10)
- c. Illustrate the applications of CFG.
 (2) (2) (12) (05)

UNIT - IV

- 6 a. Explain the working of PDA with a diagram.
 (2) (3) (2) (05)
- b. Design a PDA for accepting the language $L = \{ ww^R \mid w \text{ is in } (0+1)^* \}$. Draw the transition diagram for PDA obtained. Show the instantaneous description of the PDA for the string '0110'.
 (2) (4) (12) (05)
- c. Define turing machine. Explain with a neat diagram, the working of a basic turing machine.
 (3) (4) (3) (10)
 (2) (4) (12) (05)

- 7 a. Define a deterministic PDA (DPDA). Design a DPDA along with transition diagram for the language $L = \{ a^n b^{2n} \mid n \geq 0 \}$.
 (3) (4) (3) (14)
- b. Design a turing machine to accept the set of all palindromes over $\{a,b\}^*$. Also indicate the moves made by turing machine for the string 'aba'.
 (3) (4) (3) (06)

UNIT - V (Compulsory)

- 8 a. Explain the structure of lex with example.
 (3) (4) (3) (14)
 L CO PO M
- b. Explain parser-lexer communication.
 (2) (5) (12) (06)
- c. Define regular expression. Explain the various regular expressions in UNIX with example for each.
 (2) (5) (12) (06)
 (2) (5) (12) (08)

Fifth Semester B.E. Makeup Examination, January 2020
COMPUTER NETWORKS

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. Draw the figures/ diagrams compulsorily wherever necessary.
 2. Attempt only ONE question from each UNIT

1

- a. Explain the following terms.
- i. Data Flow.
 - ii. Half and full duplex connections.

L CO PO M

- b. Identify and explain the different layers of the TCP/IP model and correlate the layers of TCP/IP to the layers of the OSI model.

(2) (1) (1) (10)

2

- a. Compare and contrast between the following terms:
- i. LAN and WAN.
 - ii. Mesh and Bus topology.
 - iii. Physical address and Logical address.
 - iv. Specific address and Port address.

(2) (1) (1) (10)

- b. List the different layers of the OSI reference model and explain the following layers in details
- i. Network Support Layers.
 - ii. Transport Layer.
 - iii. User Support Layers.

(2) (1) (1) (10)

UNIT - II

L CO PO M

- 3 a. Discuss the following terms with respect to performance on the network efficiency:
- i. Bandwidth
 - ii. Throughput
 - iii. Latency
 - iv. Bandwidth Delay Product for LAN

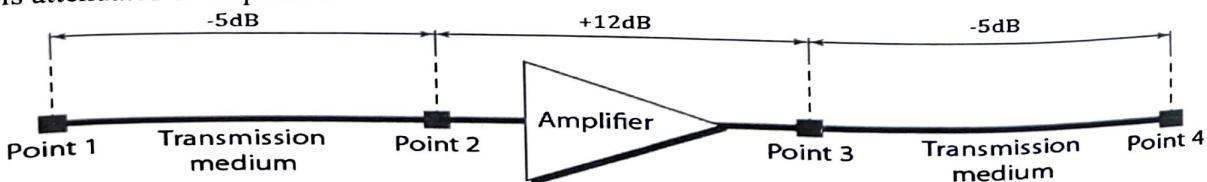
(2) (2) (1) (08)

- b. What are the two approaches to packet-switching? Explain the three phases of the Virtual-Circuit network in detail with an example.

(1) (2) (1) (12)

OR

- 4 a. What are the different causes of transmission impairments? In figure below, a signal travels from point 1 to point 4. Calculate the resultant decibel value for the signal and specify whether the signal is attenuated or amplified.



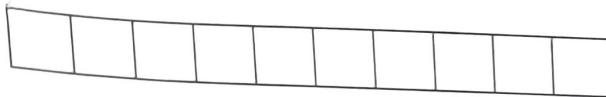
(1) (2) (1) (08)

- b. Draw the graph for the following line coding schemes using the data stream of 01011010.
- NRZ-I.
 - Manchester.
 - Differential Manchester.
- c. Write a short note on the following:
- Coaxial Cable
 - Fiber Optic Cable
 - Propagation Methods
- UNIT - III**
- (2) (2) (2) (06)
- 5 a. Solve using CRC method, if the data word is 1100 and generator polynomial is 1011 if
 a) Data word is unchanged at the receiver
 b) Data word is changed to 1110 during transmission
- (3) (2) (1) (06)
L CO PO M
- b. Explain Stop and Wait ARQ and show the flow diagrams for Lost frame and Lost Ack.
- (3) (3) (2) (10)

- 6 a. Discuss the steps involved in generating a Checksum. Solve using checksum method if the data sent is 8,9,10,7,12 and verify at the receiver.
- b. Explain Go Back N ARQ using the flow diagram for a lost frame.
- OR**
(2) (3) (1) (10)

- 7 a. Change the following IP addresses from binary notation to dotted-decimal notation and also identify the class to which they belong to.
- 01111111 11110000 01100111 11111001
 - 10101111 11000111 11111000 00011101
 - 11011111 10110000 00011111 01011101
 - 11100000 11110111 11000111 01111101
- b. Find the:
- First address
 - Last address
 - Number of addresses
- For the addresses 211.17.180.0/24 (assume the MASK as 11111111 11111111 11111111 00000000)
- c. Explain the IPv4 datagram format.
- UNIT - IV**
(2) (3) (1) (10)

- 8 a. Find the class, netid and the hostid of the following IP addresses.
- 111.56.45.78
 - 191.255.25.10
 - 207.3.54.12
 - 178.120.40.90
- b. Explain the IPV6 header format with its extension headers.
- c. Compare and contrast the IPV4 and the IPV6 headers.
- OR**
(2) (4) (1) (10)
(2) (4) (2) (05)
(2) (4) (2) (05)



Fifth/Sixth Semester B.E. Fast Track Semester End Examination, July/August 2019
COMPUTER NETWORKS

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. **UNIT I & II are Compulsory.**
 2. **Answer any one full question from remaining each UNIT.**

UNIT - I (compulsory)

- | | | |
|---|--|---------------------------|
| 1 | a. Define Data communication? Describe the four fundamental characteristics of data communication. | L CO PO M |
| | b. Explain the OSI reference model with a neat diagram. | (2) (1) (1) (06) |
| | c. Explain four levels of addresses used in TCP/IP protocol. | (2) (1) (9) (08) |

UNIT - II (compulsory)

- | | | |
|---|--|---------------------------|
| 2 | a. Write a note on i) Phase ii) Wavelength iii) Bandwidth iv) Latency v) Throughput | L CO PO M |
| | b. Explain the different causes for transmission impairment during signal transmission through media. | (2) (1) (1) (10) |
| | c. What is the propagation time if the distance between the two points is 12000 km? Assume the propagation speed to be 2.4×10^8 m/s in cable. | (2) (2) (1) (05) |

UNIT - III

- | | | |
|---|--|---------------------------|
| 3 | a. Explain Error detection and Error correction in block coding with a neat diagram. | L CO PO M |
| | b. Describe the structure of Encoder and Decoder for simple parity check code with a neat diagram. | (2) (3) (9) (08) |
| | c. Define i) Single-Bit Error ii) Burst Error | (2) (3) (1) (08) |

OR

- | | | |
|---|--|---------------------------|
| 4 | a. Describe CRC encoder and decoder with an example. | (2) (3) (1) (04) |
| | b. Write sender site and receiver site algorithm for stop-and-wait protocol. | (3) (3) (1) (10) |

UNIT - IV

- | | | |
|---|---|---------------------------|
| 5 | a. Explain Network Address Translation (NAT) with a neat diagram. | L CO PO M |
| | b. Describe IPv4 datagram format with a neat diagram. | (2) (4) (9) (06) |
| | c. Write a note on classful addressing. | (2) (4) (1) (08) |

OR

- | | | |
|---|--|---------------------------|
| 6 | a. Define delivery? Explain in brief direct and indirect delivery of packet. | (2) (3) (1) (05) |
| | b. What is forwarding? Explain Next-Hop Versus Route method with a neat diagram. | (2) (3) (1) (07) |

Fifth Semester B.E. Makeup Examination, January 2020
FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Answer ANY FIVE full questions from Each UNIT
 2. Assume any missing data

UNIT - I

L CO PO M

- 1 a. What is Automata? With Neat schematic representation explain the working of Automata? (01) (01) (01) (08)
- b. Construct DFA for the following Languages
- Set of all strings over $\Sigma = \{0,1\}$ starting with substring 01
 - Set of all strings over $\Sigma = \{0,1\}$ ending with substring 011
 - $L = \{ |w| \bmod 3 < 0, \text{ where } w \in \Sigma^* \text{ for } \Sigma = \{a, b\} \}$
 - $L = \{ |w| \bmod 3 \geq |w| \bmod 2, \text{ where } w \in \Sigma^* \text{ for } \Sigma = \{a, b\} \}$
- (03) (01) (03) (12)

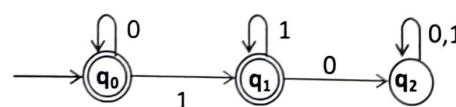
OR

- 2 a. Define Σ -NFA and Construct the Σ -NFA with four states for the following Language and Compute $\delta^*(q_0, aabb)$
 $L = \{a^n \mid n \geq 0\} \cup \{b^n a \mid n \geq 1\}$
- (03) (01) (02) (08)
- b. Apply Subset Construction Scheme by lazy evaluation and Convert the following Σ -NFA into an equivalent DFA

δ	Σ	a	b	c
$\rightarrow p$	Φ	{p}	{q}	{r}
q	{p}	{q}	{r}	Φ
*r	{q}	{r}	Φ	{p}

L CO PO M
 (03) (01) (12) (12)**UNIT - II**

- 3 a. Define Regular expression and build the Regular expression for the following languages
- To accept a language consisting of strings of a's and b's of odd length.
 - To accept a language consisting of strings of 0's and 1's that do not end with 01.
 - $L = \{ vuv \mid u, v \in \Sigma^* \text{ for } \Sigma = \{a, b\} \text{ and } |v| = 2 \}$
 - $L = \{ |w| \bmod 3 = |w| \bmod 2, \text{ where } w \in \Sigma^* \text{ for } \Sigma = \{a, b\} \}$
- (03) (02) (03) (10)
- b. Apply State elimination method to identify the Regular Expression for the following finite Automata



(03) (02) (02) (10)

OR

- 4 a. State and prove the Pumping Lemma for Regular Languages. Apply Pumping Lemma and discover that the following language is Non-Regular
 $L = \{ 0^n \mid n \text{ is perfect Square} \}$

(03) (03) (12) (10)

Fifth Semester B.E. Fast Track Semester End Examination, July/August 2019
OBJECT ORIENTED MODELING AND DESIGN

Time: 3 Hours

Max. Marks: 100

Instructions: 1. UNIT-I and UNIT-III (COMPULSORY)
 2. Use appropriate UML diagram

UNIT - I (COMPULSORY)

	L	CO	PO	M
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(2)	(1)	(2)	(10)
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- 1 a. Explain the Object Oriented Themes
 b. Discuss the following concepts with examples
 i)links and association ii)Multiplicity iii)association end names
 iv)bags and sequences v)qualified associations

(2)	(1)	(2)	(10)
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UNIT - II

	L	CO	PO	M
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(2)	(1)	(1)	(10)
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- 2 a. What is Event? Explain the different types of events with examples
 b. Differentiate between state and events. Explain the summarized Basic state diagram notation

(4)	(2)	(2)	(10)
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OR

- 3 a. Draw the main state diagram for vending machine and its submachine dispense
 b. Draw and explain the nested state diagram for a phone line

(3)	(1)	(2)	(10)
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	L	CO	PO	M
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UNIT- III (COMPULSORY)

	L	CO	PO	M
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(2)	(2)	(3)	(05)
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- 4 a. List and explain the Guidelines for constructing use case models
 b. Explain scenarios and sequence diagram with examples
 c. List and explain the Guidelines for Procedural sequence Model

(2)	(2)	(3)	(05)
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	L	CO	PO	M
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UNIT - IV

(2)	(3)	(3)	(10)
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- 5 a. How do you eliminate unnecessary and incorrect classes during domain analysis
 b. Discuss the criteria to be followed to discard unnecessary and incorrect associations during domain analysis?

(3)	(2)	(1)	(10)
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OR

- 6 a. Draw and explain the ATM class model with attributes and inheritance
 b. List the steps involved in constructing a domain state model. Explain the process with appropriate example

(2)	(3)	(1)	(10)
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	L	CO	PO	M
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UNIT - V

(2)	(3)	(3)	(10)
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- 7 a. Explain briefly with an example application interaction model

(2)	(3)	(3)	(10)
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Fifth Semester B.E. Makeup Examination, January 2020
UNIX SYSTEM PROGRAMMING

Max. Marks: 100

Time: 3 Hours

Instructions: 1. Answer any five questions by selecting at least one from each Unit.
 2. Draw the neat diagrams wherever needed.

UNIT - I

- 1 a. Write a note on UNIX, POSIX and ANSI standards
 b. Differentiate K&R C and ANSI C
 c. Write a C program to test the presence of ANSI C.

L	CO	PO	M
(2)	(1)	(1)	(06)
(3)	(1)	(1)	(10)
(2)	(1)	(3)	(04)

OR

- 2 a. Write a C program to test at least five feature test macros and explain them in brief.
 b. Write a C/C++ program to check four runtime limits for system-wide configuration and four runtime limits for file related configuration.

L	CO	PO	M
(2)	(1)	(1)	(10)
(2)	(1)	(3)	(10)

UNIT - II

- 3 a. List and explain the UNIX supported file types
 b. Write a C/C++ program to display user visible file attributes using appropriate file structure

L	CO	PO	M
(2)	(1)	(1)	(10)
(4)	(1)	(3)	(10)

OR

- 4 a. With neat diagram demonstrate the support of files by UNIX kernel
 b. Write a C/C++ program to provide a Write lock on last 100B of file. Demonstrate the child and parent process to contend for write locking the same region.

L	CO	PO	M
(2)	(1)	(1)	(10)
(4)	(1)	(3)	(10)

UNIT - III

- 5 a. Explain with syntax exit and atexit function along with the block diagram of start and termination of C program.
 b. What is the use of setjmp and longjmp functions? Illustrate with a simple program

L	CO	PO	M
(2)	(3)	(1)	(10)
(2)	(3)	(2)	(10)

OR

- 6 a. Explain the memory layout of C program in detail along with a neat diagram.
 b. Explain environment list with a neat diagram. Write a program to echo all command line arguments to standard output.

L	CO	PO	M
(2,3)	(3)	(2)	(10)

UNIT - IV

- 7 a. Write a note on UNIX kernel support for signals
 b. Explain the Error logging facility and client server model for daemon processes

L	CO	PO	M
(2)	(3)	(1)	(07)
(2)	(3)	(1)	(08)

Fifth Semester B.E. Semester End Examination, Dec./Jan. 2019-20
UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Answer any one question from each unit.
 2. Draw a neat diagram wherever applicable.

UNIT - I

L CO PO M

- 1 a. Distinguish between ANSI C and K&R C with example & write a C/C++ program to display the _POSIX_VERSION constant. (2) (1) (2) (10)
- b. Write a C/C++ program to illustrate the use of sysconf, pathconf, fpathconf for the following limit values:
 Maximum number of message queues per process, real time signals, links a file may have, length in bytes of a path name, & size of a block of data that may be automatically read from or written to a pipe file. (3) (1) (2) (10)

OR

L CO PO M

- 2 a. Write a C/C++ program that prints the POSIX-defined configuration options supported on any given system. (3) (1) (2) (10)
- b. Discuss any five POSIX.1-defined constants and POSIX.1b-defined constants. (2) (1) (1) (10)
- UNIT - II**
- 3 a. Explain the different file types available in UNIX/POSIX system. (1) (2) (1) (10)
- b. Discuss with a neat diagram the different data structures supported by Unix Kernel for files. (2) (2) (1) (10)

OR

L CO PO M

- 4 a. Explain the different file attributes available in UNIX/POSIX system (2) (2) (1) (10)
- b. Discuss the concept of File and Record Locking. Write a pseudo code for employee details file containing 1000 bytes of data. File contains confidential information from 600th byte to 900th byte. Currently file pointer is pointing to 200th byte. Move the file pointer to 600th position and apply the write lock to the next 300 bytes. (3) (2) (2) (10)

UNIT - III

L CO PO M

- 5 a. Explain eight different ways of process termination (2) (1) (1) (07)
- b. Briefly explain UNIX kernel support for processes. (1) (1) (1) (07)
- c. Write a C/C++ program to print at least 5 current resource limits (3) (1) (3) (06)

OR

- 6 a. With the neat diagram explain the memory layout of C program. (2) (1) (1) (10)
- b. Write a C/C++ program to demonstrate three different ways of accessing the environment variables. (4) (1) (3) (10)

Fifth Semester B.E. Semester End Examination, Dec./Jan. 2019-20**FORMAL LANGUAGES AND AUTOMATA THEORY**

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Answer any one full question from each UNIT.
 2. Each full question of a UNIT carries 20 marks

UNIT - I

- 1 a. Define the following with an example for each.
 (i). Alphabet (ii). Strings (iii).Power of an alphabet (iv).Transition table
 (v). Transition diagram (1) (1) (1) (05)
- b. Design a DFA to accept the language $L = \{ w \mid w \text{ is of even length and begins with } 01 \}.$ (3) (1) (3) (07)
- c. Design a NFA which accepts strings of 0's and 1's that have the symbol 1 in the second last position. Convert NFA to equivalent DFA. (3) (1) (3) (08)

OR

- 2 a. Design a NFA to accept strings of 0's and 1's that have 1 in third last position. Define Epsilon closures with an example. (3) (1) (3) (07)
- b. Design a ϵ -NFA to accept the decimal number consisting of an optional + or - sign, a string of digits, a decimal point and another string of digits, either this string of digits or string after decimal point can be empty but atleast one of the two strings is nonempty. (6) (1) (3) (08)
- c. Design a DFA to accept the language $L = \{ awa \mid w \in (a+b)^* \}$ (3) (1) (3) (05)

UNIT - II

- 3 a. Prove that, If $L=L(A)$ for some DFA A, then there is a regular expression R such that $L=L(R).$ (3) (2) (1) (06)
- b. Convert regular expression $(0+1)^*1(0+1)$ to a ϵ -NFA. (3) (2) (1) (06)
- c. Design a NFA which accepts all strings containing 110. Convert it to a regular expression. (3) (2) (1) (08)

OR

- 4 a. Minimize the following DFA using table filling algorithm.

δ	0	1
$\rightarrow A$	B	F
B	G	C
*C	A	C
D	C	G
E	H	F
F	C	G
G	G	E
H	G	C

- b. Show that $L = \{ a^n b^n \mid n \geq 0 \}$ is not regular. (6) (2) (1) (10)
 (3) (2) (1) (05)

Sixth Semester B.E. Fast Track Semester End Examination, July/August 2019
OBJECT ORIENTED MODELING DESIGN

Time: 3 Hours

Max. Marks: 100

- Instructions:** 1. *UNIT I and UNIT III are compulsory. Answer at least five questions by selecting at least one question from each other UNIT.*
 2. *Draw the figure/ diagram compulsorily wherever necessary.*

UNIT - I (Compulsory)

L	CO	PO	M
---	----	----	---

- 1 a. Explain four stages of Object oriented development methodology
 b. Discuss different types models along with relation between them

(2)	(1)	(1)	(10)
-----	-----	-----	------

UNIT - II

L	CO	PO	M
---	----	----	---

- 2 a. Explain the 3 types of events with example for each.
 b. Design the state diagram for bus ticket reservation object.

(2)	(1)	(1)	(10)
(4)	(2)	(2)	(10)

OR

- 3 a. Explain the state diagram considering the example of telephone system.
 b. Explain the behaviors of state diagrams.

(3)	(1)	(2)	(10)
(2)	(2)	(1)	(10)

UNIT - III (Compulsory)

L	CO	PO	M
---	----	----	---

- 4 a. Explain design of the sequence diagram with an example.
 b. Explain the method of using activity diagram to model any process.

(4)	(2)	(2)	(10)
(4)	(2)	(2)	(10)

UNIT - IV

L	CO	PO	M
---	----	----	---

- 5 a. Explain with an example omitting the bad classes by domain class modeling
 b. Explain the criteria for maintaining the right associations.

(2)	(3)	(1)	(10)
(2)	(3)	(1)	(10)

OR

- 6 a. List and Explain the different criteria's for eliminating the unnecessary attributes
 b. List steps and Explain the domain class Model.

(3)	(3)	(1)	(10)
(2)	(3)	(1)	(10)

UNIT - V

L	CO	PO	M
---	----	----	---

- 7 a. Explain and design use-case diagram and explain the use cases for bank ATM system.
 b. Explain the different steps in the application class modeling

(4)	(3)	(2)	(10)
(4)	(3)	(2)	(10)

OR

- 8 a. Explain the steps involved in the class design
 b. Elucidate the application interaction modeling with an example.

(2)	(3)	(1)	(10)
(2)	(3)	(1)	(10)

Fifth Semester B.E. Semester End Examination, Dec./Jan. 2019-20
COMPUTER NETWORKS

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Draw diagrams neatly wherever applicable
 2. Answer any one question from each Unit

UNIT - I

- 1 a. Define the term data communication. Explain data communication with respect to its fundamental characteristics and components. (2) (1) (1) (10)
- b. Explain the advantages and disadvantages of Mesh, Star and Bus topologies with neat diagrams. (2) (1) (1) (10)

OR

- a. Explain the functions of each layer involved in OSI model with a neat diagram. (2) (1) (1) (10)
- b. Explain the different categories of networks with neat diagrams. (2) (1) (1) (10)

UNIT - II

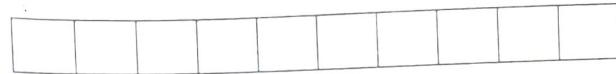
- 3 a. Discuss the different types of transmission impairment with neat diagrams. (2) (2) (1) (10)
- b. Discuss the different types of bands of Unguided media in detail. (2) (2) (1) (10)

OR

- 4 a. Explain the different modes of Fiber Optic cable along with its advantages and disadvantages. (2) (2) (1) (10)
- b. Differentiate between Datagram Networks and Virtual Circuit networks with the help of neat diagram. (2) (2) (1) (10)

UNIT - III

- 5 a. Discuss the following terms:
 i. Single bit error.
 ii. Burst error.
 iii. Forward error correction.
 iv. Retransmission. (2) (3) (1) (04)
- b. Given the data-word 1111 with the given generator polynomial 1101,
 i. Show the generation of the code-word at the sender site (using binary division).
 ii. Show the checking of the code-word at the receiver site in both ways i.e. without error and with error (Assume the error at the MSB bit of the code-word). (2) (3) (2) (06)
- c. Define Framing and the reason for its need. Explain in detail the Stop-and-Wait ARQ protocol. (2) (3) (1) (10)



Sixth Semester B.E. Semester End Examination, May/June 2018-19
OBJECT ORIENTED MODELING AND DESIGN

Max. Marks: 100

Time: 3 Hours

Instructions: 1. **UNIT - I and UNIT-III (Compulsory)**
 2. **Use appropriate UML diagram**

UNIT - I (Compulsory)

- 1 a. Explain the four aspects object orientation with examples

L	CO	PO	M
(2)	(1)	(2)	(10)

- b. Discuss the following concepts with proper UML notation
 1) Class 2) Object 3) Multiplicity 4) Association 5) Ordering

L	CO	PO	M
(2)	(1)	(2)	(10)

UNIT - II

- 2 a. Define concurrency. Explain the different types concurrency used in state modeling.

L	CO	PO	M
(2)	(1)	(1)	(10)

- b. Design the state diagram for an telephone line with at least 8 states in it and explain in brief each of the states

(4)	(2)	(2)	(10)
-----	-----	-----	------

OR

- 3 a. Demonstrate the concept of nested states for following problem statement of a vending machine:
 Initially the vending machine is idle. When a person inserts the coins, the machine adds amount to the cumulative balance. After adding some coins, a person can select an item. If the item is empty or balance is insufficient, the machine waits for another selection. Otherwise, the machine dispenses the item and returns appropriate change.

Draw the main state diagram for vending machine and its submachine dispense.

(3)	(1)	(2)	(10)
-----	-----	-----	------

- b. Explain the different behaviors of state diagrams along with example for each one

(2)	(2)	(1)	(10)
-----	-----	-----	------

UNIT - III (Compulsory)

- 4 a. Discuss Interaction Modeling. How it differs from state modeling

(3)	(2)	(3)	(05)
-----	-----	-----	------

- b. Consider the vending machine case study. List the actors and use cases. Draw the Use Case diagram.

(3)	(2)	(3)	(10)
-----	-----	-----	------

- c. What is sequence diagram? Explain briefly with an example.

(2)	(2)	(3)	(05)
-----	-----	-----	------

UNIT - IV

L	CO	PO	M
---	----	----	---

- 5 a. How do you eliminate unnecessary and incorrect classes during domain analysis?

(2)	(3)	(3)	(10)
-----	-----	-----	------

- b. What do you mean by domain state model? Describe the steps required for constructing a domain state model.

(2)	(3)	(3)	(10)
-----	-----	-----	------

OR

- 6 a. Explain briefly domain and application analysis.

(2)	(3)	(3)	(05)
-----	-----	-----	------

- b. List the steps involved in domain state model. Explain the process with appropriate example.

(2)	(3)	(3)	(10)
-----	-----	-----	------

- c. Explain the domain interaction model.

(2)	(3)	(3)	(05)
-----	-----	-----	------

Fifth Semester B.E. Semester End Examination, Dec./Jan. 2019-20
ADVANCED WEB PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: - 1. Answer one full question from each unit.
 2. Draw the diagrams wherever necessary.

UNIT - I

- 1 a. List out difference between frames and hidden frames
 b. Explain HTTP responses along with status codes
 c. Write a short note on
 i) Google Suggest ii) Gmail iii) Google Maps iv) Yahoo News v) Bitflux Blog

L	CO	PO	M
(1)	(1)	(1)	(04)
(2)	(1)	(1)	(06)

OR

- 2 a. List and Explain any six principles of Ajax.

(2)	(1)	(1)	(06)
-----	-----	-----	------

- b. Describe with the diagram the advantages and disadvantages of XHR.

(2)	(1)	(1)	(04)
-----	-----	-----	------

- c. Define Design patterns. Explain predictive fetch pattern and submission throttling pattern.

(2)	(1)	(1)	(10)
-----	-----	-----	------

UNIT - II

- 3 a. List the benefits of full stack development

(1)	(1)	(1)	(05)
-----	-----	-----	------

- b. Explain with the diagram one-way data binding and two-way data binding.

(2)	(1)	(1)	(10)
-----	-----	-----	------

- c. Write a short note on hardware architecture for MEAN stack development.

(3)	(1)	(1)	(05)
-----	-----	-----	------

OR

- 4 a. Compare relational databases and document databases.

(2)	(1)	(1)	(05)
-----	-----	-----	------

- b. Explain with the diagram MEAN stack architecture. Also explain the purpose of each technology in MEAN stack.

(2)	(1)	(1)	(10)
-----	-----	-----	------

- c. List and explain rapid prototype development stages of MEAN stack architecture.

(2)	(1)	(1)	(05)
-----	-----	-----	------

UNIT - III

- 5 a. Explain request response flow of MVC architecture.

(2)	(1)	(1)	(05)
-----	-----	-----	------

- b. The *add_review* page must contain a form with name, rating and review fields which the user will fill in and submit for a particular location. The appropriate error handling mechanism must be added for the submission of the form. Write the code for *add_review.jade* and design the appropriate desktop and mobile screen layouts for the same.

(5)	(2)	(3)	(10)
-----	-----	-----	------

- c. Explain how you test routes and controllers.

(2)	(1)	(1)	(05)
-----	-----	-----	------

Sixth Semester B.E. Makeup Examination, May/June 2018-19**OBJECT ORIENTED MODELING AND DESIGN**

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. **UNIT I and UNIT III are compulsory.** Answer at least five questions by selecting at least one question from each other UNIT.
 2. Draw the figure/ diagram compulsorily wherever necessary.

UNIT - I (Compulsory)

L CO PO M

- 1 a. Explain the stages of Object oriented software development methodology (2) (1) (1) (07)
- b. What is modeling? Discuss different models along with relation between them (2) (1) (1) (08)
- c. Prepare a class diagram for a graphical document editor that supports grouping. Assume that a document consists of several sheets. Each sheet contains drawing objects, including text, geometrical objects and groups. A group is simply a set of drawing objects, possibly including other groups. A group must contain at least two drawing objects. A drawing object can be direct member of at most one group. Geometrical objects include circles, ellipses, rectangles, lines, and squares. (4) (2) (2) (05)

UNIT - II

L CO PO M

- 2 a. List the significance of state modeling (1) (2) (2) (05)
- b. What is an event? Explain briefly different forms of event with an example. (1,2) (2) (2) (05)
- c. With proper UML notation for state diagram, explain different elements of the state diagram. Consider the atm_withdraw function. Draw the state diagram for the same. (3) (2) (3) (10)

OR

- 3 a. Explain the various state diagram behaviors. (2) (2) (2) (10)
- b. What do you mean by signal generalization? Place the following signal classes into generalization hierarchy: pick, character input, line pick, circle pick, box pick, text pick and input signal. (3) (2) (3) (05)
- c. Explain with an example the concept of synchronization of concurrent activities. (2) (2) (3) (05)

UNIT - III (Compulsory)

L CO PO M

- 4 a. Design the sequence diagram for an email server system that sends a text email to some destination email address via typical email service. (4) (2) (2) (08)
- b. Draw an activity diagram for admission process in a college. The process starts from seat allocation to and student's id distribution. (4) (2) (2) (07)
- c. Explain the use case "include" and "extend" relationships with an example for both. (2) (1) (1) (05)

UNIT - IV

L CO PO M

- 5 a. Explain with an example the ways of keeping the right classes in domain class modeling (2) (3) (1) (10)
- b. Explain the different criteria in discarding the unnecessary and incorrect associations. (2) (3) (1) (10)

Fifth Semester B.E. Semester End Examination, Dec./Jan. 2019-20**ADVANCED JAVA****Max. Marks: 100**

3 Hours

*Instructions: 1. Answer any one full question from each unit.***UNIT - I**

L CO PO M

Briefly describe the collection framework. Write a Java program to insert 4 objects of type Employee in a Linked List and display them in ascending order of their names. Insert two more employees at the third and fifth position.

(3) (2) (3) (10)

(3) (2) (3) (10)

OR

Describe the usage of Map and Map Entry interfaces with code examples.

(2) (2) (1) (10)

What is an iterator? Write a Java program to illustrate the difference in accessing the collections using an iterator and a for-each loop.

(3) (2) (1) (10)

L CO PO M

UNIT - II

Describe the two ways of creating threads in Java with code examples.

(2) (1) (1) (10)

Write a program to show how wait and notify can be used to solve the Producer-Consumer problem.

(3) (1) (3) (10)

OR

Write a Java program to create two threads, one which prints odd numbers and the other prints even numbers. The output should be in sequential order (1, 2, 3, 4....)

(3) (1) (3) (10)

Describe the Java Thread model.

(2) (1) (1) (05)

With a code example, explain thread priority.

(2) (1) (1) (05)

L CO PO M

UNIT - III

Explain the different types of Swing buttons and how to use them with examples.

(2) (3) (5) (10)

Write a program to create two text fields "Java" and "Advanced Java" and add the event handler to both the buttons.

(4) (3) (5) (10)

OR

Write a program to create a JTabbedPane and JScrollPane.

(3) (3) (5) (10)

What is Swing? Explain the main features of Swing.

(2) (3) (3) (05)

Explain components and containers in java

(2) (3) (3) (05)

L CO PO M

UNIT - IV

Explain the architecture of JDBC with a neat diagram.

(2) (4) (1) (10)

X Fifth Semester B.E. Makeup Examination, January 2019
UNIX SYSTEM PROGRAMMING

Max. Marks: 100

Time: 3 Hours

Instructions: 1. *Unit I and Unit II are Compulsory.*
 2. *Answer any one FULL question from remaining each Unit.*

UNIT - I

- 1 a. List the differences between ANSI C and C++. Explain each with example. (2) (1) (1) (06)
- b. What are POSIX standards? Explain different subsets of POSIX standard. Write a C/C++ program to check and display the version of a POSIX. (3) (1) (3) (07)
- c. What do you understand by term feature test macros? Write a C / C++ program for POSIX feature test macros. (3) (1) (1) (07)

UNIT - II

- 2 a. Explain the UNIX kernel support for files with a neat diagram. (2) (1) (1) (10)
- b. Mention the different file types available in UNIX / POSIX system along with commands to create them. (2) (1) (3) (10)

UNIT - III

- 3 a. With a neat diagram, explain the memory layout of c program. (2) (1) (3) (08)
- b. Explain the various dynamic memory allocation techniques in UNIX along with the prototype. (2) (2) (1) (06)
- c. What are environment variables? Write a C/C++ program that outputs the contents of its environment list. (3) (1) (1) (06)

OR

- 4 a. Write a note on getrlimit and setrlimit functions along with their prototype. (2) (1) (3) (04)
- b. Describe the UNIX Kernel support for process with a neat diagram. (2) (1) (12) (10)
- c. With an example explain the use of setjmp and longjmp functions. (2) (1) (1) (06)

UNIT - IV

- 5 a. What are signals? Write a program to setup signal handler for the SIGINT signal using sigaction API. (3) (3) (3) (08)
- b. Explain the following API's along with their prototypes with respect to signals.
 i) sigprocmask
 ii) sigaction
 iii) alarm
 iv) kill (2) (3) (1) (12)

Fifth Semester B.E. Fast Track Semester End Examination, July/August 2019

ADVANCED JAVA

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *UNIT 1 & UNIT 2 are Compulsory.*
 2. *Answer any one full question from remaining each UNITS.*

UNIT - I (Compulsory)

L CO PO M

- 1 a. What is an Iterator? Write a program to access a collection using an Iterator. (1) (1) (1) (10)
 b. What is the need of Synchronization? Explain with an example how synchronization is implemented in Java. (2) (1) (1) (10)

UNIT - II (Compulsory)L CO PO M
 (2) (2) (2) (10)

- 2 a. Discuss the different types of swing buttons with syntax. Write a program to create four types of buttons. Use suitable events to show actions on the buttons and use JLabel to display the action invoked. (1) (2) (1) (05)
 b. What is a Javabean? Explain the properties of JavaBean with example. (1) (2) (2) (05)
 c. What is Swing? Explain the main features of Swing. (1) (2) (2) (05)

UNIT - IIIL CO PO M
 (2) (3) (3) (10)

- 3 a. Explain the architecture of JDBC with a neat diagram. (2) (3) (3) (10)
 b. Write the code snippets for Java database connectivity. (4) (3) (3) (10)

ORL CO PO M
 (4) (3) (3) (10)
 (2) (3) (1) (10)**UNIT - IV**L CO PO M
 (3) (3) (3) (10)
 (2) (3) (1) (10)**OR**

- 6 a. Explain the Tomcat web server with a example. (2) (3) (5) (10)
 b. Explain the Servlet interfaces and Servlet exception classes. (2) (3) (1) (10)

UNIT - VL CO PO M
 (2) (4) (1) (10)
 (3) (4) (3) (10)

Fifth Semester B.E. Makeup Examination, January 2019
FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 Hours

Max. Marks: 100

Instructions: 1. UNIT III & V are Compulsory.
 2. Answer any one full question from remaining each UNITS.

UNIT - I

- 1 a. Rephrase the formal definition of DFA.

L CO PO M

(1) (1) (2) (04)

- b. Design a DFA to accept the language $L = \{w|w \text{ is of the form } x01y \text{ for some strings } x \text{ and } y \text{ consisting of 0's and 1's. Compute } \hat{o}^*(q_0, 00001111)\}$
 c. Design an NFA which accepts exactly those strings that have the symbol 1 in the second last position. Convert NFA to equivalent DFA using Subset Construction scheme by lazy evaluation.

(3) (1) (2) (06)

(4) (1) (2) (10)

OR

- 2 a. Design a DFA to accept strings of a's and b's except those containing the substring aab

(3) (1) (2) (06)

- b. Design a ϵ -NFA to accept the decimal number consisting of an optional + or - sign, a string of digits, a decimal point and another string of digits, either this string of digits or string after decimal point can be empty but atleast one of the two strings is nonempty.

(4) (1) (2) (08)

- c. Design a DFA to accept the language $L = \{awa \mid w \in (a+b)^*\}$

(4) (1) (2) (06)

UNIT - II

- 3 a. Define regular expression. Find regular expression for the following:

L CO PO M

i) $L = \{ a^n b^m \mid (m+n) \text{ is even } \}$ ii) Strings of a's and b's whose 4th symbol from the end is 'b'.

iii) Strings of 0's and 1's having no two consecutive zeros.

(3) (2) (2) (07)

- b. Show that the language $L = \{ a^n \mid n \text{ is prime} \}$ is not regular.

(3) (3) (1) (05)

- c. Translate the following DFA to a regular expression using state-elimination method.

δ	0	1
--> $*q_0$	q_1	q_2
q_1	q_3	q_0
q_2	q_0	q_3
q_3	q_3	q_3

OR

- 4 a. State and prove pumping lemma for regular languages.

(2) (2) (1) (08)

(3) (3) (1) (06)

Sixth Semester B.E. Semester End Examination, May/June 2018-19**DATA MINING**

Time: 3 Hours

Max. Marks: 100

- Instructions:*
1. Unit I and Unit II are compulsory.
 2. Answer any one full question from remaining units
 3. Use suitable examples wherever needed.

UNIT – I (Compulsory)

- 1 a. What is data warehouse? List and explain the general guidelines for implementing data warehouse. (1) (1) (1) (10)

- b. Explain the process of ETL with an example (2) (1) (1) (10)

UNIT – II (Compulsory)

- 2 a. What is an attribute? List and explain different attribute types (2) (2) (1) (05)

- b. Describe data preprocessing. Summarize the different strategies/ techniques available for data preprocessing (2) (2) (1) (10)

- c. Compute the cosine similarity for the given document vectors

$$X = (3, 2, 0, 5, 0, 0, 0, 2, 0, 8) \quad Y = (1, 0, 0, 0, 0, 1, 0, 1, 0, 2)$$

(3) (2) (2) (05)

UNIT – III

- 3 a. Summarize how to extract association rules efficiently from a given frequent dataset. (3) (3) (2) (10)

- b. Explain the FP growth algorithm with an example (3) (3) (1) (10)

OR

- 4 a. For the transaction data set,

TID	Items
1	{a,b}
2	{b,c,d}
3	{a,c,d,e}
4	{a,d,e}
5	{a,b,c}
6	{a,b,c,d}
7	{a}
8	{a,b,c}
9	{a,b,d}
10	{b,c,e}

Construct the FP tree and explain the steps followed in constructing it.

(3) (3) (3) (05)

- b. Explain how rule generation is done in Apriori algorithm with a pseudocode for the same (2) (3) (1) (10)

- c. Discuss the concept of Support & Confidence (2) (3) (1) (05)

(2) (3) (1) (05)

Fifth Semester B.E. Makeup Examination, January 2019
COMPUTER NETWORKS

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. **UNIT I and UNIT II are Compulsory. Answer any three FULL Questions from remaining UNITS**
 2. **Show suitable diagrams wherever necessary, which is not mandatory.**

UNIT - I

L CO PO M

- 1 a. Define communication system. And Identify the five components of data communication system. (01) (01) (01) (06)

- b. Compare and contrast between the following:
 - i. Point-to-Point connection and Multipoint connections.
 - ii. Mesh topology and Star topology.(01) (01) (01) (04)
- c. Explain the functions carried out by different layers of OSI reference model. (02) (01) (01) (10)

UNIT - II

- 2 a. Describe 'Phase' of a sine wave. Calculate the frequency of a wave with wavelength 2.5m and speed 50m/s. List broad categories of transmission medium used for data communication. (02) (02) (02) (07)
- b. What is 'Virtual-Circuit 'networks? Explain its characteristics. (02) (01) (01) (05)
- c. Illustrate 'Circuit Switched 'networks showing switch connection and explanation for all the three phases of communication. (02) (03) (02) (08)

UNIT - III

- 3 a. Differentiate between the following:
 - i. Single bit error v/s Burst Error.
 - ii. Error Detection v/s Error Correction.
 - iii. Forward Error correction v/s Retransmission.(02) (03) (01) (05)
- b. For the following data-word 1011 with the given divisor 1001,
 - i. Show the generation of the code-word at the sender site (using binary division).
 - ii. Show the checking of the code-word at the receiver site in both ways i.e. without error and with error (Assume the error at the MSB bit of the code-word).(02) (03) (03) (05)
- c. Explain in detail the Stop-and-Wait ARQ protocol. (02) (03) (01) (10)

OR

- 4 a. List the steps undertaken by the sender and receiver for error detection in 16 bit IP Checksum. For the following data items 0x3456, 0xABCC, 0x02BC and 0xEEEE find the 16 bit IP Checksum at:
 - i. Sender Site.
 - ii. Receiver Site if there is no error.
 - iii. Receiver Site if the second data item is changed to 0xABCD(02) (03) (01) (06)

Sixth Semester B.E. Fast Track Semester End Examination, July/August 2019

DATA MINING

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. Unit I and Unit II are compulsory
 2. Answer any one full question from remaining units
 3. Use suitable examples wherever needed.

UNIT – I (COMPULSORY)

- 1 a. Define data warehouse. List and explain the implementation steps for building a data warehouse
(2) L (1) CO (1) PO (1) M (10)
- b. Describe OLAP. Explain the general characteristics of OLAP
(2) L (1) CO (1) PO (1) M (10)

UNIT – II (COMPULSORY)

- 2 a. What is data mining? Explain the different data mining tasks with suitable examples.
(2) L (2) CO (2) PO (1) M (10)
- b. Write a note on applications of data mining in different fields.
(2) L (2) CO (2) PO (1) M (06)
- c. Compute the cosine similarity for the given document vectors
 $X = (2,2,1,2,3,4,2,3,2,0)$ $Y = (2,3,2,2,1,2,1,0,1,2)$
(3) L (2) CO (3) PO (3) M (04)

UNIT - III

- 3 a. What is frequent itemset? Explain how frequent item set is generated using FP growth algorithm
(3) L (3) CO (3) PO (1) M (10)
- b. Illustrate the application of apriori algorithm in generation of frequent itemset
(3) L (3) CO (3) PO (1) M (10)

OR

- 4 a. How rules can be generated using apriori algorithm? Explain with suitable snippets
(3) L (3) CO (3) PO (3) M (10)
- b. For the transaction data set,

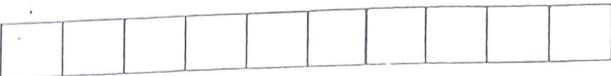
TID	Items
1	{milk}
2	{milk, bread}
3	{milk, bread, butter}
4	{bread, butter}
5	{butter, diaper}
6	{bread, butter, diaper}
7	{milk}
8	{diaper}
9	{bread, diaper}
10	{bread}

Construct the FP tree for the above transaction data set. Also generate the frequent itemset.

(3) L (3) CO (3) PO (3) M (10)

UNIT - IV

- 5 a. Discuss hunt's algorithm for decision tree induction with suitable example
(3) L (2) CO (2) PO (2) M (10)
- b. Explain k nearest neighbor algorithm with suitable example
(3) L (2) CO (2) PO (3) M (10)



Fifth Semester B.E. Semester End Examination Dec/Jan 2018-19
UNIX SYSTEM PROGRAMMING

Max. Marks: 100

Time: 3 Hours

- Instructions:*
1. UNIT I & II are Compulsory.
 2. Answer any one full question from remaining each UNITS.
 3. Write comments for all the programs.

UNIT - I

L CO PO M

- 1 a. List and explain the features by which ANSI C differs from K and R C with an example for each. (2) (1) (1) (07)
- b. Write C / C++ POSIX compliant program to check the following limits:
 i) Number of clock ticks iii) Maximum number of child processes
 ii) Maximum path length iv) Maximum number of characters in a file name. (3) (1) (3) (08)
- c. Explain the common characteristics of API along with error status codes with their meaning. (2) (1) (1) (05)

UNIT - II

- 2 a. Explain the different file types available in UNIX or POSIX system along with the commands used for creating and deleting of files. (2) (1) (3) (10)
- b. Write a psuedocode for a given Employee.txt file that contains information of all employees. Size of file is 5000 bytes. Employee's confidential data is stored between the regions of 4000 to 5000 byte. Currently file pointer is pointing to 2000th position. Move the pointer to 4000th position and apply the write lock so that other processes cannot access the confidential data stored in that region. (3) (1) (3) (06)
- c. List and explain all the attributes of a file along with their meaning. (2) (1) (3) (04)

UNIT - III

- 3 a. Explain the various ways of process termination. With a neat diagram explain how a C program is started and how it terminates. (2) (1) (1) (10)
- b. What is the importance of Environment list in UNIX. Write a C / C++ program to display the entire environment list from the system. (3) (1) (3) (06)
- c. Give reasons as to why shared libraries are better, with an example. (2) (1) (1) (04)

OR

- 4 a. Explain the need and use of setjmp and longjmp functions along with the syntax. Also, write a program to demonstrate the use of setjmp and longjmp functions. (3) (1) (3) (10)
- b. With a neat diagram, explain the memory layout of a C program. Identify the various segments when the following program is executed.

```
#include<stdio.h>
```

```
int a=5;
int b;
int data[100];
main( )
{
    int x;
```

Fifth Semester B.E. Semester End Examination, Dec/Jan 2018-19
FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 Hours

Max. Marks: 100

Instructions: 1. UNIT-III and UNIT-V are compulsory
 2. Answer any one full question from remaining units

UNIT - I

1. a. Define the following with examples.
 i) Alphabet ii) String iii) Language
- b. Design DFA for the following:
 i) To accept the strings of a's and b's ending with 'abb'.
 ii) $L = \{ w \text{ such that } |w| \bmod 4 = 0, w \in \{a,b\}^* \}$
- c. Convert the following ϵ -NFA to DFA

L	CO	PO	M
---	----	----	---

δ	ϵ	a	b
-->p	{r}	{q}	{p, r}
q	Φ	{p}	Φ
*r	{p, q}	{r}	{p}

(3)	(1)	(3)	(7)
-----	-----	-----	-----

OR

2. a. Define finite automata. List the applications of finite automata.
 b. Design a DFA to accept the binary numbers which are divisible by 4.

(1)	(1)	(12)	(5)
-----	-----	------	-----

- c. Design an NFA to accept the strings of 0's and 1's whose 2nd symbol from the right end is '1'.
 Convert the same NFA to DFA.

(3)	(1)	(3)	(5)
-----	-----	-----	-----

UNIT - II

3. a. State and Prove Pumping Lemma for regular languages.
 b. Convert regular expression $(0+1)^*1(0+1)$ to a ϵ -NFA.
 c. Design a NFA which accepts all strings containing 110. Convert it to a regular expression using state elimination method.

(3)	(1)	(3)	(10)
-----	-----	-----	------

L	CO	PO	M
---	----	----	---

4. a. Show that $L = \{a^n b^n \mid n \geq 0\}$ is not regular.

(4)	(2)	(3)	(8)
-----	-----	-----	-----

L	CO	PO	M
---	----	----	---

OR

- a. Show that $L = \{a^n b^n \mid n \geq 0\}$ is not regular.

(3)	(2)	(2)	(5)
-----	-----	-----	-----

- b. Minimize the following DFA using table filling algorithm.

δ	0	1
$\rightarrow A$	B	F
B	G	C
*C	A	C
D	C	G
E	H	F
F	C	G
G	G	E
H	G	C

(3) (2) (2) (10)

- c. Prove that If L is a regular language over an alphabet Σ then $\bar{L} = \Sigma^* - L$ is also a regular language.

(5) (2) (2) (5)

UNIT - III

- 5 a. Define context-free-grammar(CFG). Construct CFG for the following languages:

i) $L = \{ w \mid w \in (0+1)^*110 \}$
ii) $L = \{ 0^{n+1}1^n \mid n \geq 1 \}$

(3) (2) (2) (6)

- b. Write the LMD, RMD and parse tree for the string '+*-xyxy' using the grammar
 $E \rightarrow +EE \mid *EE \mid -EE \mid x \mid y$

(3) (2) (2) (6)

- c. Convert the following grammar into CNF.

S \rightarrow 0A | 1B
A \rightarrow 0AA | 1S | 1
B \rightarrow 1BB | 0S | 0

(3) (3) (3) (8)
L CO PO M

UNIT - IV

- 6 a. Define Push Down Automata.

(1) (4) (2) (3)

- b. Design a PDA to accept the language $L(M) = \{ wCw^R \mid w \in (a+b)^* \text{ where } w^R \text{ is reverse of } w \text{ by a final state.} \}$

- c. Show that the PDA to accept the language $L(M) = \{ w \mid w \in (a,b)^* \text{ and } n_a(w) > n_b(w) \}$ is nondeterministic.

(3) (4) (2) (9)
L CO PO M

OR

- 7 a. Explain the Programming techniques for Turing machines.

(1) (4) (3) (2)

- b. Define Turing machine.

(2) (4) (2) (8)

- c. Design a Turing machine to accept the language consisting of all palindromes of 0's and 1's.

(3) (4) (2) (10)
L CO PO M

UNIT - V

- 8 a. Explain the structure of Lex with an example.

(2) (5) (12) (6)

- b. Explain parser-lexer communication.

(2) (5) (12) (6)

- c. Write a yacc program to recognize an arithmetic expression involving operators +, -, *, / and %.

(2) (5) (12) (6)
(3) (5) (3) (8)

Fifth Semester B.E. Makeup Examination, January 2019
UNIX SYSTEM PROGRAMMING

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Unit I and Unit II are Compulsory.
 2. Answer any one FULL question from remaining each Unit.

UNIT - I

- | | L | CO | PO | M |
|------|---|-----|-----|----------|
| 1 a. | List the differences between ANSI C and C++. Explain each with example. | (2) | (1) | (1) (06) |
| b. | What are POSIX standards? Explain different subsets of POSIX standard. Write a C/C++ program to check and display the version of a POSIX. | (3) | (1) | (3) (07) |
| c. | What do you understand by term feature test macros? Write a C / C++ program for POSIX feature test macros. | (3) | (1) | (1) (07) |

UNIT - II

- | | L | CO | PO | M |
|------|---|-----|-----|----------|
| 2 a. | Explain the UNIX kernel support for files with a neat diagram. | (2) | (1) | (1) (10) |
| b. | Mention the different file types available in UNIX / POSIX system along with commands to create them. | (2) | (1) | (3) (10) |

UNIT - III

- | | L | CO | PO | M |
|------|--|-----|-----|----------|
| 3 a. | With a neat diagram, explain the memory layout of c program. | (2) | (1) | (3) (08) |
| b. | Explain the various dynamic memory allocation techniques in UNIX along with the prototype. | (2) | (2) | (1) (06) |
| c. | What are environment variables? Write a C/C++ program that outputs the contents of its environment list. | (3) | (1) | (1) (06) |

OR

- | | | | | |
|------|---|-----|-----|-----------|
| 4 a. | Write a note on getrlimit and setrlimit functions along with their prototype. | (2) | (1) | (3) (04) |
| b. | Describe the UNIX Kernel support for process with a neat diagram. | (2) | (1) | (12) (10) |
| c. | With an example explain the use of setjmp and longjmp functions. | (2) | (1) | (1) (06) |

UNIT - IV

- | | L | CO | PO | M |
|------|---|-----|-----|----------|
| 5 a. | What are signals? Write a program to setup signal handler for the SIGINT signal using sigaction API. | (3) | (3) | (3) (08) |
| b. | Explain the following API's along with their prototypes with respect to signals.
i) sigprocmask
ii) sigaction
iii) alarm
iv) kill | (2) | (3) | (1) (12) |

Fifth Semester B.E. Semester End Examination, Dec/Jan 2018-19
COMPUTER NETWORKS

Max. Marks: 100

Time: 3 Hours

Instructions: 1. UNIT I and UNIT II are Compulsory. Answer any three FULL Questions from remaining UNITS.
 2. Draw the figures/ diagrams compulsorily wherever necessary.

UNIT - I

L CO PO M

- 1 a. Define protocol and explain its key elements. List the network topologies used for data communications. Explain any two with a neat diagram. (2) (1) (1) (07)
- b. Describe standards in data communication. (2) (1) (1) (05)
- c. Explain functions of each layers involved in TCP/IP protocol suite (2) (3) (1) (08)

UNIT - II

L CO PO M

- 2 a. Discuss the relation of the following terms with respect to performance of network:
 i. Bandwidth
 ii. Throughput
 iii. Latency
 iv. Bandwidth Delay product (2) (2) (1) (08)
- b. What are the two approaches of switching in networks? Explain any one in detail. (2) (2) (1) (12)

UNIT - III

L CO PO M

- 3 a. Identify the responsibilities of data link layer. What are the types of errors in network communication? Give examples. Compare error detection with error correction. (2) (3) (1) (08)
- b. Derive a CRC codeword using the dataword 1100 and the divisor 1011. Decode the same to show the syndrome as zero. (2) (2) (2) (07)
- c. Explain the terms 'Cyclic Code' and 'Checksum' with suitable examples. List the advantages of cyclic codes. (2) (1) (1) (05)

OR

- 4 a. Describe 'Data Link Control' functionalities. How 'Framing' is useful in data link layer? List its variants and protocols used in data transmission. (2) (1) (1) (08)
- b. Explain 'Noiseless Channel' and Nyquist theorem. (2) (1) (1) (07)
- c. Distinguish between 'Flow control' and 'Error control' with a suitable note on each. (2) (2) (1) (05)

UNIT - IV

L CO PO M

- 5 a. Discuss the different addressing classes used in IPV4. Give the details of address space. (2) (4) (1) (10)
- b. Compare and contrast the IPV4 and the IPV6 headers. (2) (4) (1) (06)

Fifth Semester B.E. Makeup Examination, January 2019
FORMAL LANGUAGES AND AUTOMATA THEORY

Time: 3 Hours

Max. Marks: 100

Instructions: 1. UNIT III & V are Compulsory.
 2. Answer any one full question from remaining each UNITS.

UNIT - I

L CO PO M

- 1 a. Rephrase the formal definition of DFA. (1) (1) (2) (04)
- b. Design a DFA to accept the language $L = \{w|w \text{ is of the form } x01y \text{ for some strings } x \text{ and } y \text{ consisting of 0's and 1's. Compute } \delta^*(q_0, 00001111)\}$ (3) (1) (2) (06)
- c. Design an NFA which accepts exactly those strings that have the symbol 1 in the second last position. Convert NFA to equivalent DFA using Subset Construction scheme by lazy evaluation. (4) (1) (2) (10)

OR

- 2 a. Design a DFA to accept strings of a's and b's except those containing the substring aab (3) (1) (2) (06)
- b. Design a ϵ -NFA to accept the decimal number consisting of an optional + or - sign, a string of digits, a decimal point and another string of digits, either this string of digits or string after decimal point can be empty but atleast one of the two strings is nonempty. (4) (1) (2) (08)
- c. Design a DFA to accept the language $L = \{awa \mid w \in (a+b)^*\}$ (4) (1) (2) (06)

UNIT - II

L CO PO M

- 3 a. Define regular expression. Find regular expression for the following:
 i) $L = \{ a^n b^m \mid (m+n) \text{ is even} \}$
 ii) Strings of a's and b's whose 4th symbol from the end is 'b'.
 iii) Strings of 0's and 1's having no two consecutive zeros. (3) (2) (2) (07)
- b. Show that the language $L = \{ a^n \mid n \text{ is prime} \}$ is not regular. (3) (3) (1) (05)
- c. Translate the following DFA to a regular expression using state-elimination method.

δ	0	1
$-->^* q_0$	q_1	q_2
q_1	q_3	q_0
q_2	q_0	q_3
q_3	q_3	q_3

(2) (2) (1) (08)

OR

- 4 a. State and prove pumping lemma for regular languages.

(3) (3) (1) (06)

Fifth Semester B.E. Semester End Examination, Dec/Jan 2018-19**ADVANCED WEB PROGRAMMING**

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. *Unit-I and Unit-II are compulsory*
 2. *Answer any one full question from each of the remaining units.*

UNIT - I

- 1 a. List and explain any five basic principles of ajax. (02) (01) (01) (05)
- b. Explain how do you handle multiple browser implementations in Ajax with examples (02) (01) (01) (05)
- c. Explain with example fallback patterns. Write an Ajax code to fetch content from text file and display it on the webpage. (03) (01) (03) (10)

UNIT - II

- 2 a. Explain the benefits of full stack development. (02) (01) (01) (05)
- b. Compare integrated approach and API approach of data integration into node.js. (02) (01) (01) (05)
- c. What is the difference between development hardware and production hardware? Recommend suitable hardware architecture for the following scenarios. Justify your recommendations
 a. An application with low amounts of traffic.
 b. For Platform as a service
 c. Growing traffic
 d. Overloading traffic or thousands of requests per second. (05) - (01) (03) (10)

UNIT - III

- 3 a. The primary aim for the homepage is to display a list of locations. Each location will need to have a name, an address, the distance away, users' ratings, and a facilities list. We'll also want to add a header to the page, and some text to put the list in context, so that users know what they're looking at when they first visit. Design a Desktop and mobile screen layouts for the given scenario. (05) (02) (03) (10)
- b. Explain the need for Bootstrap. Explain breakpoints that Bootstrap targets for different types of devices. (02) (02) (01) (05)
- c. Explain how you test controllers and routes. (02) (01) (01) (05)

OR

- 4 a. Explain the usage of jade templates. Also explain the index.jade and layout.jade template files with sample code. (02) (01) (01) (10)
- b. Explain how a relational database and document database store repeating information relating to a parent element. (02) (01) (01) (05)
- c. Explain how the application and database talk to each other through models. (02) (01) (01) (05)

Fifth Semester B.E. Makeup Examination, January 2019
COMPUTER NETWORKS

Hours

Max. Marks: 100

- Instructions: 1. *UNIT I and UNIT II are Compulsory. Answer any three FULL Questions from remaining UNITS*
 2. *Show suitable diagrams wherever necessary, which is not mandatory.*

UNIT - I

L CO PO M

Define communication system. And Identify the five components of data communication system.

(01) (01) (01) (06)

Compare and contrast between the following:

- i. Point-to-Point connection and Multipoint connections.
- ii. Mesh topology and Star topology.

(01) (01) (01) (04)

Explain the functions carried out by different layers of OSI reference model.

(02) (01) (01) (10)

UNIT - II

Describe ‘Phase’ of a sine wave. Calculate the frequency of a wave with wavelength 2.5m and speed 50m/s. List broad categories of transmission medium used for data communication.

(02) (02) (02) (07)

- b. What is ‘Virtual-Circuit ‘networks? Explain its characteristics.

(02) (01) (01) (05)

- c. Illustrate ‘Circuit Switched ‘networks showing switch connection and explanation for all the three phases of communication.

(02) (03) (02) (08)

UNIT - III

- a. Differentiate between the following:
- i. Single bit error v/s Burst Error.
 - ii. Error Detection v/s Error Correction.
 - iii. Forward Error correction v/s Retransmission.

(02) (03) (01) (05)

- b. For the following data-word 1011 with the given divisor 1001,
- i. Show the generation of the code-word at the sender site (using binary division).
 - ii. Show the checking of the code-word at the receiver site in both ways i.e. without error and with error (Assume the error at the MSB bit of the code-word).

(02) (03) (03) (05)

- c. Explain in detail the Stop-and-Wait ARQ protocol.

(02) (03) (01) (10)

OR

- a. List the steps undertaken by the sender and receiver for error detection in 16 bit IP Checksum. For the following data items 0x3456, 0xABCC, 0x02BC and 0xEEEE find the 16 bit IP Checksum at:
- i. Sender Site.
 - ii. Receiver Site if there is no error.
 - iii. Receiver Site if the second data item is changed to 0xABCD

(02) (03) (01) (06)

Sixth Semester B.E. Semester End Examination, May / June 2018
DATA MINING

Max. Marks: 100

Time: 3 Hours

- Instructions:**
1. Unit - I and II are compulsory. Answer any one question from remaining units.
 2. Assume missing data.
 3. Answers must be accurate and to the point.

UNIT - I

- 1 a. What is operational data store (ODS)? Explain with neat diagram. 06 M
(Level[1], CO[1], PO[1])
- b. What is ETL? Explain the steps of data cleaning. 06 M
(Levl [1], CO [1], PO [1])
- c. Explain: i) ROLAP ii) MOLAP iii) FASMI iv) DATACUBE 08 M
(Level [2], CO [1], PO [1])

UNIT - II

- 2 a. Calculate Euclidian distance and Minkowski distance for $p_1(0,2)$, $p_2(2,0)$, $p_3(3,1)$, $p_4(5,1)$ as a distance matrix. 06 M
(Level [2], CO [1], PO [2])
- b. Illustrate with examples Simple Matching Coefficient (SMC) and Jacard Coefficient (JC). 06 M
(Level [2], CO [1], PO [1])
- c. Illustrate Cosine similarity using example, $x=(3,2,0,5,0,0,0,2,0,0)$ and $y=(1,0,0,0,0,0,0,1,0,2)$. 08 M
(Level [2], CO [1], PO [2])

UNIT - III

- 3 a. Illustrate frequent itemset generation using the Apriori algorithm. 06 M
(Level [2], CO [2], PO [2])
- b. How to efficiently generate rules from frequent itemsets 06 M
(Level [1], CO [2], PO [2])
- c. Illustrate FP-Growth Algorithm for discovering frequent itemsets. 08 M
(Level [2], CO [3], PO [2])

OR

- 4 a. Illustrate alternate methods for generating Frequent Itemset. 06 M
(Level [2], CO [2], PO [2])
- b. Interpret candidate generation and pruning 06 M
(Level [2], CO [2], PO [2])
- c. Illustrate the concept of Maximal Frequent Itemsets 08 M
(Level [2], CO [2], PO [2])

UNIT IV

- 5 a. Define: 1) Confusion matrix 2) Accuracy 3) Error rate to demonstrate induction and deduction, w.r.t. Classification. 06 M
(Level [2], CO [2], PO [2])

Sixth Semester B.E. Makeup Examination, June 2018
DATA MINING

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. *Questions I and II are compulsory.*
 2. *Assume missing data.*
 3. *Answers must be accurate and to the point.*

UNIT - I

- 1 a. Explain the guidelines to implement the data warehouse. 06 M
(Level[1],CO[1],PO[1])

- b. What is ETL? Explain the steps in ETL. 06 M
(Level [1], CO [1], PO [1])

- c. Explain the operation of data-cube with suitable examples. 08 M
(Level [1], CO [1], PO [1])

UNIT - II

- 2 a. Demonstrate Dissimilarities between Data Objects by Distances. 06 M
(Level [2], CO [1], PO [1])

- b. Calculate simple matching coefficient (SMC), jacard coefficient (JC) for
 $x=0101010001$ and $y=0100011000$. 06 M
(Level [3], CO [1], PO [1])

- c. Here are two very short texts to compare:
A=Julie loves me more than Linda loves me
B=Jane likes me more than Julie loves me
Calculate similarity in these texts are, purely in terms of word counts (and ignoring word order). 08 M
(Level [3], CO [1], PO [2])

UNIT - III

- 3 a. Explain with pseudo code: Apriori algorithm, for frequent itemset generation. 06 M
(Level [1], CO [2], PO [2])

- b. Explain alternate methods for generating Frequent Itemsets. 06 M
(Level [1], CO [2], PO [2])

- c. Comprehend the Simpson's Paradox. 08 M
(Level [1], CO [1], PO [1])

OR

- 4 a. Explain various Measures of Association Pattern Analysis 06 M
(Level [1], CO [1], PO [1])

- b. Illustrate the following alternate methods:
i) General-to-specific versus specific-to-general ii) Equivalence class iii) Breadth-first
versus Depth-first 06 M
(Level [2], CO [1], PO [1])

- c. Illustrate the concept of Maximal Frequent Itemsets 08 M
(Level [2], CO [1], PO [1])

UNIT IV

- 5 a. Demonstrate General approach to solve classification problem. 06 M
(Level [2], CO [2], PO [3])

**Sixth Semester B.E. Makeup Examination, June 2018
COMPUTER NETWORKS**

Time: 3 Hours

Max. Marks: 100

- Instructions:**
- Unit I and III are compulsory*
 - Answer any one full question from remaining each unit.*

UNIT - I

- 1 a. What are the components of data communication system? Explain in brief **05 M**
(Level [2], CO [1], PO [1])
- b. Distinguish between physical and logical address? Explain with example **05 M**
(Level [3], CO [1], PO [1])
- c. Explain the interaction between layers in the OSI Model, with a neat diagram **10 M**
(Level [2], CO [1], PO [1])

UNIT - II

- 2 a. If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700 and 900 Hz, what is its bandwidth? Draw the spectrum assuming that the components have an amplitude of 7V, 3V, 5V, 12V, and 9V respectively. **05 M**
(Level [2,3], CO [2], PO [1])
- b. i) Explain the different causes for transmission impairments when signal passes through media. ii) Differentiate circuit switched network from Packet switched network. **10 M**
(Level [2,4], CO [3], PO [1])
- c. Calculate the throughput of a network with bandwidth of 10Mbps which can pass only an average of 18000 frames per minute with each frame carrying an average of 10,000 bits. **05 M**
(Level [4], CO [2], PO [1])

OR

- 3 a. Explain the following **10 M**
- Bandwidth
 - Throughput
 - Latency
 - Jitter
 - Bit Rate
- (Level [2], CO [2], PO [3])
- b. Given a channel with 5kHz bandwidth, if we want to send data at 150 Kbps, what is the minimum SNR_{db} and SNR? **04 M**
(Level [3], CO [2], PO [1])
- c. Explain the three phases of circuit switched networks with delay in timing diagram **06 M**
(Level [2], CO [3], PO [1])

UNIT - III

- 4 a. Explain with an example of block coding method for error detection and correction. **10 M**
(Level [2], CO [3], PO [1])
- b. Outline GO-BACK-N ARQ Protocol with a neat diagram. **10 M**
(Level [2], CO [3], PO [1])