

Information Technology Department

Bachelor Of Engineering

Question Papers May - June 2018

Sem – III & VIII

(3 Hours)

Marks: 80

Note: 1. Question no. 1 is compulsory.2. Attempt any **three** questions out of remaining **five** questions.

Q.1.[a] Determine the constants a, b, c, d so that the function $f(z) = x^2 + axy + by^2 + i(cx^2 + dxy + y^2)$ is analytic. [5]

[b] Let $A = \{1, 2, 3, 4\}, B = \{1, 2, 3, 4\}$ and " aRb if and only if a is not equal to b ". Find R and its digraph. [5]

[c] For the sets A, B, C given that $A \cap B = A \cap C$ and $\bar{A} \cap B = \bar{A} \cap C$. Is it necessary that $B = C$? Justify. [5]

[d] Find Laplace transform of $f(t) = t$ for $0 < t < 1$
 $= 0$ for $1 < t < 2$, $f(t+2) = f(t)$. [5]

Q.2.[a] 75 Children went to an amusement park where they can ride on the merry-go-round, roller coaster and ferris wheel. It is known that 20 of them have taken all 3 rides, and 55 of them have taken at least two of the 3 rides. Each ride costs 0.50 Rs and the total receipt of the amusement park was 70 Rs. Determine the number of children who did not try any of the rides. [6]

[b] Evaluate $\int_0^{\infty} t e^{-3t} J_0(4t) dt = \frac{3}{125}$ if $L\{J_0(t)\} = \frac{1}{\sqrt{s^2 + 1}}$. [6]

[c] (i) Functions f, g and h are defined as follows:
 $f: \mathbb{R} \rightarrow \mathbb{R}, g: \mathbb{R} \rightarrow \mathbb{R}, h: \mathbb{R} \rightarrow \mathbb{R}, f(x) = x + 4, g(x) = x - 4$
 $h(x) = 4x$ for $x \in \mathbb{R}$, where \mathbb{R} is the set of real numbers.
 Compute $f \circ g; g \circ f; f \circ g \circ h; h \circ h$. [4]

(ii) Show that using Venn diagram $P \cap (Q - R) = (P \cap Q) - (P \cap R)$. [4]

Q.3.[a] If $f(z)$ and $|f(z)|$ are both analytic then show that $f(z)$ is constant. [6]

[b] Let R be a binary relation on the set of positive integers such that [6]

$R = \{(a, b) / a - b \text{ is an odd positive integer}\}$. Is R reflexive?

Symmetric? Antisymmetric? Transitive? An equivalence relation?

A partial ordering set?

[c] Evaluate (i) $L[te^{3t} \sin 4t]$ (ii) $L\left[\int_0^t \int_0^t \int_0^t t \sin t dt dt dt\right]$ [8]

Q.4. [a] Evaluate using Convolution theorem $L^{-1}\left[\frac{(s+2)}{(s^2+4s+8)^2}\right]$ [6]

[b] Find the transitive closure of R where R be the relation [6]

represented by $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

[c] Find analytic function $f(z) = u + iv$ where $v = e^x(x \sin y + y \cos y)$. [8]

Q.5.[a] Solve $\frac{dy}{dt} + 2y + \int_0^t y dt = \sin t$ with $y(0) = 1$. [6]

[b] Find bilinear transformation which maps the points $z = 1, i, -1$ onto $w = 0, 1, \infty$. Further show that under this transformation the unit circle in w plane is mapped onto a straight line in the z plane.

[c] In a bolt factory machines A, B, and C manufacture respectively 25%, 35% and 40% of the total. Of their output 5, 4, 2 percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B and C? [8]

Q.6. [a] It is known that at the university 60% of the professors play tennis, 50% of them play bridge, 70% jog, 20% play tennis and bridge, 30% play tennis and jog, 40% play bridge and jog. If someone claimed that 20% of the professors jog and play bridge and tennis, would you believe this claim? Why? [6]

[b] Suppose repetitions are not permitted. [6]

(i) How many four- digit numbers can be formed from the digits 1, 2, 3, 5, 7, 8?

(ii) How many of the numbers in part (a) are less than 4000?

(iii) How many of the numbers in part (a) are odd?

(iv) How many of the numbers in part (a) are multiples of 5?

[c] Evaluate (i) $L^{-1}[2 \tanh^{-1} s]$ (ii) $L^{-1}\left[\frac{e^{4-3s}}{(s+4)^{\frac{5}{2}}}\right]$ [8]

(3 Hours)

(Total Marks : 80)

Please check whether you have the right question paper.

- N.B.: 1) Questions No. 1 is compulsory.
 2) Solve any three question out of remaining five questions.
 3) Assume suitable data if necessary.
 4) Figures to the right indicate full marks.

1 Solve any four out of five :

(20)

- Explain Input and Output characteristics of CE configuration of BJT.
- Convert following decimal number to Binary, Octal, Hexadecimal and Gray code $(154)_{10}$.
- Design EX-OR gate using only NOR gates.
- Draw two truth tables illustrating the outputs of a full-adder, one table for the sum output
- Convert S - R flip-flop to D flip-flop.

2. a) Implement following using only one 8:1 Multiplexer and few gates :

(10)

$$f(A, B, C, D) = \sum m(1, 2, 3, 5, 6, 9, 10, 11, 14)$$

b) Using Quine McCluskey Method determine Minimal SOP form for

(10)

$$f(A, B, C, D) = \sum m(1, 3, 5, 6, 8, 9, 12, 14, 15) + \sum d(4, 10, 13)$$

3. a) Explain Collector to base bias Circuit with its stability factor.

(10)

b) With neat diagram explain operation of ALU IC74181.

(10)

4. a) Design a Mod 10 synchronous counter using S-R Flip-flop.

(10)

b) Minimize the following four variable logic function using K-map :

(10)

$$f(A, B, C, D) = \sum m(0, 2, 3, 5, 6, 7, 8, 10, 11, 14, 15) \text{ and design using only NAND gates.}$$

5. a) Simplify following equation using Boolean algebra and Design using basic gates

(10)

$$f(A, B, C) = A'B + BC' + BC + AB'C'$$

b) Explain Entity in VHDL and Write VHDL program for half subtractor circuit.

(10)

6. Solve the following (Any Four) :

(20)

- Explain working of Universal Shift Register.
- Working of T flip flop.
- Explain working of Differential Amplifier.
- Write VHDL program for EX-NOR gate.
- Explain working of Encoder and Decoder.

N.B.: 1) Question No. 1 is compulsory.

2) Answer any three out of remaining questions.

3) Assume suitable data if necessary.

4) Figures to the right indicate full marks.

Q1. A). Define stack. Give its applications?

2

B). what are the different linear and non- linear data structures?

3

C). what is a Linked list? Explain its types.

3

D). Define asymptotic notation with an example.

3

E). what is Recursion? State its advantages and disadvantages.

3

F). Define minimum spanning tree. List the techniques to compute minimum spanning tree.

3

G). Define expression tree with example.

3

Q2. A). Write an algorithm to create doubly linked list and display the list?

10

B). Write an algorithm to implement Queue using array?

10

Q3. A). Write an algorithm to convert INFIX to POSTFIX expression?

10

B). Write the algorithm for merge sort. Comment on its complexity?

10

Q4. A). Write an algorithm to implement Priority queue?

10

B). Explain BFS and DFS algorithm with examples?

10

Q5.A). Define Binary search tree. Explain the different operations on a binary search tree with examples?

10

B). What is minimum spanning tree? Explain Kruskal's Algorithm with an example.

10

Q6. Short notes on (any 4)

20

- a. Selection Sort
- b. Prim's Algorithm
- c. Binary Search
- d. Hashing techniques
- e. Dijkstra's Algorithm

SE (IT) Sem-III choice based Q. P. Code: 37783

DBMS

(3 Hours)

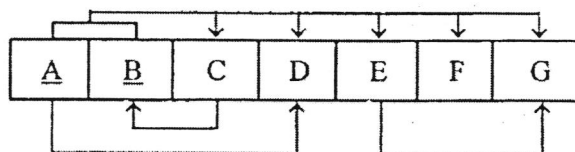
02/01/2018

Marks : 80

N.B. : 1. Question no. 1 is compulsory.

2. Solve any Three questions out of remaining Five questions.

- Q 1 a Explain Role of DBA ? 5
b List all the functional dependencies satisfied by the relation. 5
- | X | Y | Z |
|----|----|----|
| X1 | Y1 | Z1 |
| X1 | Y2 | Z1 |
| X2 | Y2 | Z1 |
| X2 | Y2 | Z1 |
- c What is the difference between unique key and primary key? 5
d Explain different types of attributes with examples? 5
- Q 2 a Explain static hashing technique with example? 10
b Define Normalization? Explain 1NF, 2NF and 3NF with examples? 10
- Q 3 a Consider the following employee database. 10
Employee(empname, street, city, date_of_joining)
Works(empname, company_name, salary)
Company(company_name, city)
Manages(empname, manager_name)
Write SQL queries for the following statements:
i) Modify the database so that employee "Sachin" now lives in "Mumbai"
ii) Find number of employees in each city with date_of_joining as "01-Aug-2017"
iii) List the name of companies starting with letter "A"
iv) Display empname, manager_name, city of those employees whose date_of_joining is greater than "01-01-2014"
b Explain DBMS architecture 10
- Q 4 a Construct a dependency diagram of relation R and normalize it up to the BCNF Normal form 10



- b Explain different types of relational algebra operations. 10
- Q 5 a Explain Cursors and its types with example 10
b Draw EER diagram for Hospital Management System showing constraints on generalisation and specialisation 10
- Q 6 Write a short note on: 5
a Types of Entities 5
b Authorization in SQL 5
c Views in SQL 5
d B-tree 5



SE (IT) Sem-III Choice based May 2018
PCE - 01/06/2018 (Principles of Communication)
Q. P. Code: 35136
Time: 3 hours
Total Marks : 80

- N.B. (1). Question No.1 is compulsory.
(2). Out of remaining attempt any three.
(3). Assume & mention suitable data wherever required.
(4). Figures to right indicates full marks.

Q1 Write any **four** of the following

- a) Explain pre-emphasis & de-emphasis
- b) Explain shot noise & transit time noise in brief
- c) State drawbacks of delta modulation system & how it is removed
- d) Explain principles of Sky wave propagation in brief.
- e) State and prove differentiation property in time domain of Fourier transform

20

Q2

- a) Explain PWM generation & degeneration method in detail
- b) Explain PCM Encoder & PCM decoder with block diagram

0
10
10

Q3

- a) a sinusoidal carrier has an amplitude of 10 V & a frequency of 100 KHz. It is amplitude Modulated by a sinusoidal voltage of amplitude 3V & a frequency of 500 Hz. Modulated Voltage is developed across 75Ω .

- (i) Write the equation of modulated wave
- (ii) Determine modulation index
- (iii) Calculate total average power
- (iv) Power carried by sidebands
- (v) Spectrum of modulated wave

10
10
10

- b) Explain in detail indirect method of generation of FM with suitable diagram

Q4

- a) What is multiplexing in communication system? Draw and explain transmitter and Receiver of FDM
- b) Explain with reference to AM receiver (i) fidelity (ii) selectivity (iii) sensitivity
iv) Image frequency and its rejection. (v) Double spotting

10
10

Q5

- Draw the ASK, FSK & PSK waveforms for digital data 11010011
- What do you mean by inter symbol interference & how it is avoided
- What do you mean international standards for communication system?

06

08

06

How frequencies are allocated?

20

Q6 Write short notes on (any four)

- friss formula
- sampling theorem
- line codes
- types of communication channel
- Space wave propagation

16

18

26

10

Hours: 3 hrs

Marks: 80

Note: 1. Question no. 1 is compulsory.

2. Attempt any three questions out of remaining five questions.

Q.1.[a] A random discrete variable x has the probability density function given

x	-2	-1	0	1	2	3
$P(x)$	0.2	k	0.1	$2k$	0.1	$2k$

Find (i) k (ii) $E(X)$ (iii) $V(X)$.[b] Find smallest positive integer modulo 5, to which $3^2 \cdot 3^3 \cdot 3^4 \cdot 3^{10}$ is congruent. [5][c] Given two lines of regression lines $6y = 5x + 90$, $15x = 8y + 130$. [5]Find (i) \bar{x} , \bar{y} (ii) correlation coefficient r .[d] Show that $G = \{1, -1, i, -i\}$ is a group under usual multiplication of complex number. [5]Q.2.[a] Show that $111^{333} + 333^{111}$ is divisible by 7. [6]

[b] The following table gives the number of accidents in a city during a week. Find whether the accidents are uniformly distributed over a week. [6]

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
No. of accidents	13	15	9	11	12	10	14	84

[c] (i) Write the following permutation as the product of disjoint cycles [8]

$$f = (1 \ 3 \ 2 \ 5) (1 \ 4 \ 5) (2 \ 5 \ 1).$$

(ii) Simplify as sum of product $(A+B) (A+B') (A'+B) (A'+B')$.Q.3.[a] Find gcd (2378, 1769) using Euclidean Algorithm. Also find x and y such that $2378x + 1769y = \text{gcd}(2378, 1769)$. [6]

[b] Give an example of a graph which has [6]

(i) Eulerian circuit but not a Hamiltonian circuit

(ii) Hamiltonian circuit but not an Eulerian circuit

(iii) Both Hamiltonian circuit and Eulerian circuit

[c] Show that (D_{10}, \leq) is a lattice. Draw its Hasse diagram. [8]Q.4.[a] Calculate the coefficient of correlation between x and y from the following data [6]

x	23	27	28	29	30	31	33	35	36	39
y	18	22	23	24	25	26	28	29	30	32

[b] Let G be a group of all permutations of degree 3 on 3 symbols 1, 2 & 3. Let $H = \{I, (1 \ 2)\}$ be a subgroup of G . find all the distinct left cosets of H in G and hence index of H . [6]

[c] (i) The average marks scored by 32 boys is 72 with standard deviation of 8 while that for 36 girls is 70 with standard deviation of 6. Test at 5% LOS whether the boys perform better than the girls. [8]

(ii) A random sample of 15 items gives the mean 6.2 and variance 10.24. Can it be regarded as drawn from a normal population with mean 5.4 at 5% LOS?

- Q.5.[a] Derive mgf of Binomial distribution and hence find its mean and variance. [6]
 [b] It was found that the burning life of electric bulbs of a particular brand was normally distributed with the mean 1200 hrs and the S.D. of 90 hours, Estimate the number of bulbs in a lot of 2500 bulbs having the burning life: (i) more than 1300 hours (ii) between 1050 and 1400 hours. [6]
 [c] (i) Find inverse of $8^{-1} \pmod{77}$ using Euler's theorem. [8]
 (ii) Find the Jacobi's symbol of $\left(\frac{32}{15}\right)$.
- Q.6.[a] Solve $x \equiv 1 \pmod{3}$, $x \equiv 2 \pmod{5}$, $x \equiv 3 \pmod{7}$. [6]
 [b] Given $L = \{1, 2, 4, 5, 10, 20\}$ with divisibility relation. Verify that (L, \leq) is a distributive but not complemented Lattice. [6]
 [c] (i) Draw a complete graph of 5 vertices. [8]
 (ii) Give an example of tree. (sketch the tree).

S.E(IT) / Sem-IV / Choice Base / Comp. Networks

Q. P. Code: 38761

[Time: Three Hours]

[Marks: 80]

Please check whether you have got the right question paper

N.B.:

1. Question number **ONE** is compulsory
2. Attempt any **THREE** questions from question 2 to 6
3. Figures to the right indicate full marks.

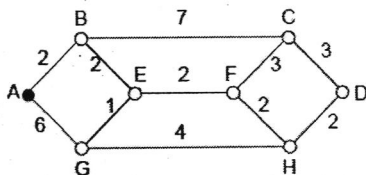
Q. 1. Answer any **FOUR** from the following 20

- a) What are the routing devices in computer network? Explain each of them in brief.
- b) Compare lossy with lossless data compression technique.
- c) List five nonproprietary Internet applications and the application-layer protocols that they use.
- d) Examine the advantages of LAN, WAN and MAN.
- e) Examine problems in Application Layer.

Q. 2 a) Explain TCP network model for network communication. Hence, choose a layer which is responsible for routing of packets. 10

Q. 2 b) Explain Client-Server communication architecture. 10

Q. 3 a) Create a shortest path between node A and D 10



Q. 3 b) What is IP? Explain IPv6 Header. 10

Q. 4 a) Justify that the Stop-and-Wait protocol is not good for network communications. 10

Q. 4 b) Justify Hamming Code is error detection and correction code. 10

Q. 5 a) What is MACA? Explain by giving suitable example. 10

Q. 5 b) What is carrier sense? Explain any one carrier sense protocol. 10

Q. 6. Answer any **FOUR** from the following 20

- a) Examine different types of ALOHA.
- b) What is broader gateway protocol (BGP) Explain BGP in brief.
- c) Why do HTTP, FTP, SMTP, and POP3 run on top of TCP rather than on UDP?
- d) Compare various data flow control techniques.
- e) What is classful addressing? Explain difference classes of IP address.

(3 hours)

[80 marks]

NOTE: Question No 1 is compulsory

Attempt any three questions from remaining.

Assume suitable data if necessary.

23/05/18

- Q.1. a) What are the major activities of an Operating system with regard to file management and memory management? 10M
- b) Compare and contrast stateless and stateful service with the help of an example. 10M
- Q.2. a) Explain with the help of an example, which of the following scheduling algorithms could result in starvation? 10M
- First-come, first-served
 - Shortest job first
 - Round robin
 - Priority
- b) What resources are used when a thread is created? How do they differ from those used when a process is created? 10M
- Q.3. a) Show that, if the wait () and signal () semaphore operations are not executed atomically, then mutual exclusion may be violated. 10M
- b) Consider the following snapshot of a system: 10M

	Allocation	Max	Available
	ABCD	ABCD	ABCD
P ₀	0012	0012	1520
p ₁	1000	1750	
p ₂	1354	2356	
p ₃	0632	0652	
p ₄	0014	0656	

Answer the following questions using the banker's algorithm:

- What is the content of the matrix Need?
 - Is the system in a safe state?
 - If a request from process P₁ arrives for (0,4,2,0), can the request be granted immediately?
- Q.4. a) With the help of a neat labeled diagram, explain the hardware support with TLB for paging. 10M
- b) Consider the following page reference string: 10M

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six, and seven frames?

Remember that all frames are initially empty, so your first unique pages will cost one fault each.

- LRU replacement
- FIFO replacement
- Optimal replacement

- Q.5. a) Justify the statement: Demand paging can significantly affect the performance of computer system. 10M
- b) Compare and contrast given allocation methods: Contiguous allocation, Linked allocation, Indexed allocation. 10M
- Q.6. Write Short Notes on: (Any four) 20M
- Just-in-time compiler.
 - Memory segmentation
 - Deadlock avoidance in distributed system.
 - Operating System Schedulers
 - File system organization
 - Two-phase locking protocol

(3 Hours)

[Total Marks: 80]

N.B.: (1) Question No. 1 is compulsory.

(2) Solve any three questions out of remaining five.

(3) Figures to right indicate full marks.

(4) Assume suitable data where necessary.

1. Solve any four out of five sub questions.

[04 x 05=20]

- Differentiate between minimum and maximum mode of operation of 8086 microprocessor.
- Explain any five arithmetic instructions of 8086 microprocessor with suitable examples.
- Draw and explain basic instruction execution cycle.
- Describe Nano programming.
- Explain the hierarchical organization of computer memory.

2. a) Explain with suitable diagram architecture of 8086 microprocessor.

10

b) Explain hardwired approach to the design of a control unit.

10

3. a) Represent the number $(-0.125)_{10}$ in single and double precision IEEE 754 binary floating point representation formats.

10

b) Write 8086 Assembly Language Program to convert two digit packed BCD number to unpacked BCD number.

10

4. a) Identify the addressing modes of following instructions and explain their meaning.

10

I. MOV AX, 1000

II. MOV AX, [1000]

III. MOV AX, BX

IV. MOV [BX], AX

V. MOV AX, [SI+200]

b) Draw the flowchart of Booths algorithm and multiply $(-7)*(3)$ using Booths algorithm.

10

5. a) Explain working of DMA and its different configurations.

10

b) Explain different cache memory mapping techniques.

10

6. Write notes on (any two)

20

a) Interleaved and Associative memory.

b) Interrupt driven I/O

c) Pipeline Hazards

1. S.E.(IT)/Sem IV/ Choice Base / Automata Theory

Q. P. Code: 40016

Duration: 3 Hours

Marks :80

04/06/18

Note :

1. Question No.1 is compulsory.
2. Attempt any three question form remaining question.
3. Draw suitable diagram whenever necessary.
4. Assume suitable data if, necessary.

Q.1:

- a) Design FA for decimal number divisible by 4 (05)
- b) Write a regular expression for $a^n b^m c^k$ where $n+m$ is odd and k is even (05)
- c) Design NFA for binary number divisible by 4 or 6 (05)
- d) Design Moore machine for binary adder. (05)

Q.2:

- a) Convert the following Regular Expression to NFA with Null moves, then convert it to DFA (10)
 $(0+1)^* 011 (0+1)^*$
- b) Give the Regular expression and corresponding DFA for all the words that begin and end with double letter (10)

Q.3:

- a) Design the Turing machine for $a^n b^n c^n$ where $n \geq 1$. (10)
- b) Write a Right linear grammar and left linear grammar for RE $(0+1)^* 0$ and show derivation tree for 1010110. (10)

Q.4:

- a) Construct CFG for the following
 - i. Alternate sequences of 0 and 1. (03)
 - ii. Do not contain 3 consecutive b's (04)
 - iii. $a^n b^m c^k$ where $k=n+m$ (03)
- b) Design CFG for $a^n b^n$ where $n \geq 1$ and convert it to Chomsky's Normal form (10)

Q.5:

- a) What is Ambiguous Grammar, find if the following grammar is ambiguous or not? (10)
 $S \rightarrow S+S$
 $S \rightarrow S^*S$
 $S \rightarrow a$
 $S \rightarrow b$
- b) Design PDA for odd length palindrome, let $\Sigma = \{0,1\}$, $L = \{W X W^R \text{ where } W \in \Sigma^*\}$ (10)

Q.6:

- a) Design Turing machine which adds 2 unary numbers and convert the Turing machine design to a Program (12)
- b) Explain the Applications of Automata (FM,PDA,TM) in detail with example (08)

T.E. (IT) / SEM-V / CBSCS / Computer Graphics & Virtual Reality
 Q. P. Code: 36376

21/05/18

- NB : 1) Question 1 is compulsory.
 2) Attempt any **three** questions from the **remaining** questions.
 3) Assume suitable data wherever applicable.
 4) Draw figures wherever applicable.

- | | | |
|---|--|----|
| 1 | (a) Explain different applications of computer graphics. | 5 |
| | (b) Explain different types of virtual reality systems. | 5 |
| | (c) Prove that two successive rotation are additive. | 5 |
| | (d) Explain fractals | 5 |
| 2 | (a) Explain Virtual reality architecture. | 10 |
| | (b) Explain Bresenham's line drawing algorithm. How it is different from DDA | 10 |
| 3 | (a) Find the Bézier curve given 4 control points (25,25), (45,40), (60,45) and (90,10) using the step size as 0.1. | 10 |
| | (b) List various polygon filling algorithms and explain boundary fill in detail. | 10 |
| 4 | (a) Explain geometric and kinematic modeling in detail | 10 |
| | (b) Explain Sutherland Hodgeman polygon clipping algorithm. | 10 |
| 5 | (a) Explain 2D transformations with suitable example for each. | 10 |
| | (b) Explain Cohen Sutherland line clipping algorithm with example. | 10 |
| 6 | Write short note on (any four) | 20 |
| | (a) Antialiasing techniques | |
| | (b) Application of Virtual Reality | |
| | (c) Text Clipping | |
| | (d) VR toolkit | |
| | (e) Morphing techniques | |

25/05/18

N.B.:- (1) Question No. 1 is **Compulsory**.

(2) Solve any **three** questions from the remaining **five** questions.

(3) **Figures** to the **right** indicate **full** marks.

(4) Make **suitable** assumptions wherever **necessary** and state them **clearly**.

1. (a) Define Embedded System. Discuss various components of embedded system. 5
(b) What is Semaphore? Explain Mutex in RTOS. 5
(c) Compare AJMP, SJMP, LJMP instructions of 8051. 5
(d) Explain the brief Real Time operating Systems 5
2. (a) Explain in detail ARM 7 pipelining 10
(b) Explain the Timer/ Counter of IC 8051. 10
3. (a) Write an assembly language program for 8051 microcontroller to multiply two 8 bit numbers stored external memory locations 4000H and 4001 H. Send the result on PORT 1 and PORT 3. 10
(b) Explain CPSR register of ARM 7 processor. 10
4. (a) Explain the addressing modes of ARM 7 processor. 10
(b) Explain the hardware and software interrupts of 8051 microcontroller 10
5. (a) Explain Internal memory organization of 8051. 10
(b) Explain the addressing modes of 8051 microcontroller. 10
6. Write note on (any two): 20
(a) Automated meter reading system.
(b) Digital Camera.
(c) Serial communication of 8051.
(d) Assembler directives.

(Time: 3 Hrs)

Marks: 80

31/05/18

N.B. : 1. Question no. 1 is Compulsory.

2. Solve any **Three** questions out of remaining **Five** questions.

- | | | |
|------|--|----|
| Qu-1 | a) Explain concept of a View in SQL. | 5 |
| | b) What is the role of Metadata in data warehouse? | 5 |
| | c) Use Figure-1 and write SQL query to retrieve the name of each employee who has a dependent with the same first name and is the same sex as the employee | 5 |
| | d) What is Write-Ahead Logging and when it is used? | 5 |
| Qu-2 | a) Explain the ARIES Recovery Algorithm with suitable example. | 10 |
| | b) Explain Star Schema. Draw Star Schema for Supermarket. | 10 |
| Qu-3 | a) Explain Multilevel Indexes with suitable example. | 10 |
| | b) Explain Data Warehouse architecture in detail. | 10 |
| Qu-4 | a) Explain OLAP Operations in Multidimensional Data Model with suitable example. | 10 |
| | b) Explain Query Processing and Optimization in Distributed Databases. | 10 |
| Qu-5 | a) Explain the concept, Immediate Data Extraction and Deferred Data Extraction in data warehouse with suitable example. | 10 |
| | b) List and Explain Data Fragmentation in distributed databases. | 10 |
| Qu-6 | Attempt the following. | |
| | a) There are two levels for assigning privileges to use the database system: i) The account level and ii) The relation/table level. Give example of each considering the database shown in Figure-1 . | 5 |
| | b) Write short note on "SQL Injection". | 5 |
| | c) What is multiple granularity locking? Under what circumstances is it used? | 5 |
| | d) Suppose we want to check whenever an employee's salary is greater than the salary of his or her direct supervisor in the COMPANY database shown in Figure-1 . Several events can trigger this rule: inserting a new employee record, changing an employee's salary, or changing an employee's supervisor.
Create a SALARY_VIOLATION trigger which will notify the supervisor about the salary violations. | 5 |

EMPLOYEE

Fname	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
-------	-------	-------	------------	-------	---------	-----	--------	-----------	-----

DEPARTMENT

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
-------	----------------	---------	----------------

DEPT_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
----------------	------------------

PROJECT

Pname	<u>Pnumber</u>	Plocation	Dnum
-------	----------------	-----------	------

WORKS_ON

<u>Essn</u>	<u>Pno</u>	Hours
-------------	------------	-------

DEPENDENT

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
-------------	-----------------------	-----	-------	--------------

Figure-1. Schema diagram for the COMPANY relational database schema.

————— END —————

06/06/2018

- N.B. (1) Question number 1 is compulsory.
 (2) Solve any 3 from remaining.
 (3) Assume suitable data where ever necessary.

Q.1. Attempt the following:

20

- Explain any two widely used open sources licenses.
- What are redirects used for? Explain with suitable examples.
- What are explicit and implicit Intent? What do you mean by Intent resolution?
- Explain different Layouts in Android Programming

Q.2.

- (a) Explain different file access permissions in Linux. Explain chmod, chown, chgrp

10

- (b) Write note on sed. Show how it can be used for

10

- As replacement for head command
- As find and replace utility, for all two or more digit numbers by string 'N'

Q3.

- (a) Discuss significance of passwd, shadow, group and gshadow files in /etc directory

10

- (b) Explain use of wget and curl commands to get website contents.

10

Q4.

- (a) Write a note on process management in Linux. Explain relevant commands.

10

- (b) Explain telnet, netstat, nslookup, traceroute, ping commands with example usage.

10

Q5.

- (a) Explain use of httpd.conf Explain any five configuration directives used in httpd.conf file.

10

- (b) Explain how to work with data and Files in Android application.

10

Q6.

- (a) Explain File System Hierarchy in Linux

10

- (b) Write note on Disk partitioning. Explain role of Logical Volume Manager as device mapper.

10

Time 3 hours

Marks 80

Note: Question No. 1 is Compulsory**Attempt any 3 Questions from the Remaining Questions.****Q.1****20**

- What is the difference between Prescriptive & Evolutionary model ?
- What are the different probable Origins of Changes that are requested for software?
- List & Elaborate Software Engineering Practice core principles.
- Explain following design Concepts: Abstraction & Modularity.

Q.2

- Explain different metrics for size estimation with their advantages and disadvantages. **10**

- Explain Agile methodology with XP Agile Development Process. **10**

Q.3

- What is the importance of Requirement Analysis? Explain different Requirement Engineering tasks. **10**

- Draw Control Flow Graph and find Cyclomatic Complexity for the following PDL : **10**
 if (c1 or c2 and c3) s1;
 else s2;
 while (c4) s3; s4;
 do s5; while (c5);
 s6

Q.4

- Explain how Change Control & Version Control are carried out in Software Configuration Management. **10**

- What is Evolutionary model? List Evolutionary models. Explain any one in detail. **10**

Q.5.

- What are the Risks associated with software Projects? How do Project Managers manage such Risks? **10**

- Explain the relationship among scope, schedule and budget. **5**

- Explain Object oriented Testing. **5**

Q.6

- What is CMMI? How it is different from CMM. Explain all levels of CMMI. **10**

- Draw DFD upto Level 2 for Restaurant Management System which has Food Ordering , Food Delivering , Invoice Creation and Payments subsystem **10**

T.E(IT)/SEM VI/CBSGS/Distributed Systems

Q.P. Code: 27155

3 hours

[80 marks]

N. B.:

- (1) Question no 1 is compulsory.
- (2) Attempt **any three** questions out of remaining five.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data wherever necessary

- 18/05/18
- Q.1 .a Differentiate between Statefull & Stateless server. **5M**
b Assume a client calls an asynchronous RPC to a server, and subsequently waits until the server returns a result using another asynchronous RPC. Is this approach the same as letting the client execute a normal RPC? What if we replace the asynchronous RPCs with synchronous RPCs? Discuss. **10M**
c In the two-phase commit protocol, why can blocking never be completely eliminated, even when the participants elect a new coordinator? **5M**
- Q.2.a Explain Distributed Computing model with the help of example. **10M**
b Explain implementation of sequential consistency model with non replicating migrating blocks strategy. **10M**
- Q.3 a. What is physical clock synchronization? Explain any one in details. **10M**
b Explain the issues to be handled While designing DSM? **10M**
- Q.4.a Explain Code Migration & role of mobile agent. **10M**
b Write a note on Group Communication. **10M**
- Q.5.a. Explain Distributed algorithm for mutual exclusion. What are the advantage and disadvantage of it over Centralized algorithm **10M**
b What are the Purpose of WSDL? Explain WSDL document structure using Block diagram. **10M**
- Q.6 Write a short note on (any two) **20M**
a. .NET Remoting
b. SOA lifecycle
c. Network Operating system
d. Corba

Note: 1) Question 1 is compulsory.

2) Solve any 3 questions from remaining questions.

24/5/18

1. a) Explain with example Vulnerability, Threat and Attack. (5)
- b) What are different ways of authenticating a user? (5)
- c) Explain ARP Spoofing. (5)
- d) What is IP Spoofing & IP Sniffing? (5)
2. a) Explain RSA algorithm steps with an example and list real time applications where RSA can be used. (10)
- b) Explain different types of Firewalls that can be used to secure a network with advantages and disadvantages. (10)
3. a) What is the need of SSL? Explain all phases of SSL Handshake Protocol in detail. (10)
- b) Briefly explain types of Malicious Codes with example. Explain methods of malware detection. (10)
4. a) What is the need of Intrusion Detection System (IDS)? Explain different types of IDS with advantages and disadvantages. (10)
- b) Explain Secure Email protocols and S/MIME. (10)
5. a) What is SSO? Explain the working of Kerberos Authentication Protocol (KAP). (10)
- b) What is Digital Certificate? Explain the process of the generation & verification of digital certificate. (10)
6. Write short notes on: (Any Four) (20)
 - a) ACM, ACL & C-List
 - b) Federated Identity Management
 - c) Distributed Denial of Service (DDoS) Attack
 - d) Honey pots
 - e) Windows Security Model

TE (I.T). Semr VI CBGS

30/5/2018
Q. P. code 40997

~~DM & BI~~ DM & BI

(3 HOURS)

[TOTAL MARKS:100]

- N.B. 1.Question 1 is compulsory
2.Attempt any four question out of the remaining six question.
3.All Question carry equal marks.
4.Illustrate answers with neat sketches whenever required.

- Q.1(a) List and describe five primitives for specifying data mining task 10
(b) Explain Data mining as a step in KDD. Give the architecture of typical Data Mining system. 10
- Q.2 (a) Explain BIRCH algorithm with example 10
(b) Explain Hoeffding tree algorithm with example 10
- Q.3 (a) Explain Multilevel association rules with suitable example 10
(b) Define classification, issues of classification and explain ID3 classification with example 10
- Q.4(a) Explain Data integration and data transformation w.r.t data warehouse 10
(b) What is text mining? Explain different approaches to text mining 10
- Q.5 (a) Explain Buisness Intelligence Issues 10
(b) What is clustering? Explain k- means clustering algorithm. Suppose the data for clustering - {2,4,10,12,3,20,11,25}
Consider k=2, cluster the given data using above algorithm. 10
- Q.6(a) Explain sequence mining in Transactional databases 10
(b) Explain periodic crawler and incremental crawler 10
- Q.7 Write short note on (Any two) 20
(a) Web Usage mining
(b) Data Discretization and Summarization
(c) Spatial data cube and spatial OLAP

(03 hours)

Total marks: 80

05/06/18

N. B. (1) Question 1 is compulsory

(2) Attempt any 3 from remaining questions

(3) Assume suitable data wherever necessary

(4) Figure indicate marks

Q. 1 A. Create a responsive web page to display time table.

10

B. List and explain different ways to add CSS in the web page.

10

Q. 2 A. Demonstrate CSS3 animations with an example.

10

B. Explain responsive web and comment on need for responsive web.

10

Q. 3. A. Explain new tags in HTML5. Comment on various ways to optimize your website.

10

B. Explain CSS3 media queries in relation to responsive web design.

10

Q. 4 A. Explain the features used to increase accessibility of a website to search engine.

10

B. Discuss in detail REST and WS.

10

Q. 5 A. Explain query selector with example.

10

B. List top ranking factors for SEO.

10

Q. 6. A. Explain transformation and animation with the help of example.

10

B. List and explain different applications of SEO.

10

Duration: 3 Hours

Total Marks assigned to the paper: 80

Instructions to the candidates, if any:-

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of remaining five questions.

Q. No.	Marks
Q.1 (a) Explain Card and Page based authoring tools with example.	(05)
(b) differentiate between JPEG and JPEG2000.	(05)
(c) Explain Motion Compensation.	(05)
(d) Explain need of quantization during transmission of videos.	(05)
Q.2 (a) What is Multimedia. Explain the objects involved in multimedia system and describe various applications.	(10)
(b) Explain Video Compression based on Motion Compensation.	(10)
Q.3 (a) Explain various file formats used in multimedia system.	(10)
(b) Explain Object based Visual Coding and Video bit Stream in MPEG-4.	(10)
Q.4 (a) Compare Staggered Broadcasting and Pyramid Broadcasting for Video on Demand.	(10)
(b) Explain different techniques for search for motion vectors	(10)
Q. 5 (a) Explain different architectures for Content Organization in multimedia databases .	(10)
(b) Explain Global Information infrastructure function model.	(10)
Q. 6 Write short notes on (Any Four)	(20)
i) VRML	
ii) Midthread Vs Midrise quantizer.	
iii) Descriptors in MPEG-4	
iv) TV trees in text databases	
v) Query Language	
vi) MIDI file format.	

2022/07/27 / 2022/07/27 / 2022/07/27

$$\frac{1}{f \cdot 10^7}$$

(11)

B.E (IT) - CBSE / S NMR / sem - VII / storage
Network mnt 2k
16/05/2018
Q. P. Code: 39048

[Time: Three Hours]

[Marks:80]

- Note: 1. Question number 1 is compulsory. Solve any three out of remaining.
2. Draw figure wherever necessary.
3. Assume suitable data wherever necessary.

- 1 (a) Consider an application that requires 1TB of storage capacity and performs 4900 IOPS. Application I/O size is 4 kB. As it is business critical application, response time must be within an acceptable range. Specification of available disk drive:
Drive capacity = 73 GB; 15,000 rpm; 5 ms average seek time; 40 MB/s transfer rate
Calculate the number of disks required? 10
- (b) An application that generates 3600 IOPs with 60% reads and 40% writes. Calculate the IOPS generated for RAID level 1, 4 and 6. Also calculate storage efficiency and usable capacity for RAID levels 3, 5 and 6 with number of disks available are 5 and each disk has storage capacity of 120 GB. 10
- 2 (a) Compare and contrast different RAID levels. 10
- (b) Explain benefits Information Lifecycle Management with respect to the challenges of Information Management. 10
- 3 (a) Explain the components of Intelligent Storage System and its types. 10
- (b) Explain FC ports and login types. 10
- 4 (a) Explain VIA with the help of block diagram. 10
- (b) Explain the architecture and implementation related limitations for efficient storage management. 10
- 5 (a) Explain the storage virtualization challenges.. 10
- (b) Explain the components and types of Information System. 10
- 6 Write short notes on: (any four) 20
- a. Business Impact Analysis(BIA)
- b. Zoned Bit Recording
- c. Infiniband
- d. Document Surrogates
- e. Network File System
- f. Document Term Matrix

N.B.: (1) Question No. 1 is **compulsory**.

(2) Attempt any **Three** questions out of remaining **Five** questions.

(3) **Figures** to the **right** indicate **full** marks.

(4) Assume suitable data if **necessary**.

22/05/18

Q.1 Answer the following:

[20]

A) Explain the role and effect of damping factor (teleportation) in PageRank computation.

B) Agility is a NoSQL business driver. Justify.

C) Give the updating buckets approach of DGIM algorithm.

D) Find Cosine Distance between the d1 and d2 vectors:

Index	1	2	3	4	5	6	7	8	9	10
d1	5	2	1	0	0	0	0	1	3	7
d2	5	2	1	0	0	1	2	2	0	2

Q.2 A) List the different NoSQL data stores. Explain any two with diagram. [10]

Q.2 B) Write steps of Girvan-Newman Algorithm. Explain clustering of Social-Network Graphs using GN algorithm with example? [10]

Q.3 A) Explain Flajolet Martin Algorithm with example. [10]

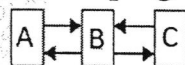
Q.3 B) Distinguish the following: [10]

i) DBMS and DSMS

ii) PCY, Multistage and Multihash

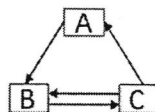
Q.4 A) List Relational-Algebra Operations. Explain any two using MapReduce. [10]

Q.4 B) Compute Efficient PageRank with the damping factor $d = 0.8$ for web. [10]



Q.5 A) What are different recommender systems. Explain any one with example. [10]

Q.5 B) Define Hub and Authority. Compute Hub and Authority scores for web. [10]



Q.6 Answer the following:

[20]

A. Core Hadoop Components

B. CURE Algorithm

C. SON Algorithm and MapReduce

D. Matrix-Vector Multiplication by MapReduce

N.B.: (1) Question No.1 is Compulsory.

(2) Attempt any three questions from remaining questions.

(3) Assume suitable data wherever required but justify the same.

(4) Figures to the right indicate full marks.

(5) Answer to each new question to be started on a fresh page.

1. (a) Elaborate the steps involved in simulation study. Why is it necessary to have program and process documentation? (10)

- (b) The sequence of numbers 0.63, 0.49, 0.24, 0.89, and 0.71 has been generated. Use the Kolmogorov-Smirnov test with $\alpha = 0.05$ to determine if the hypothesis that the numbers are uniformly distributed on the interval $[0, 1]$ can be rejected. (10)
Use $D_{0.05,5} = 0.565$.

2. (a) A firm sells bulk rolls of newsprint. The daily demand is given by the following probability distribution: (10)

Daily Demand (Rolls)	3	4	5	6
Probability	0.20	0.35	0.30	0.15

Lead time is a random variable given by the following distribution:

Lead Time (Days)	1	2	3
Probability	0.36	0.42	0.22

Determine the lead-time demand for 5 cycles of simulation. Random digits for lead time and demand are as follows:

R.D. for Lead Time	46	75	86	27	63				
R.D. for Demand	4	5	4	5	6	3	4	4	6

- (b) Draw the flowchart for arrival and departure event. Compare event-scheduling, process interaction and activity scanning algorithms. (10)

3. (a) Ace Heating and Air Conditioning service finds that the amount of time a repairman needs to fix a furnace is uniformly distributed between 1.5 and 4 hours. (10)

(i) Find the probability that a randomly selected furnace repair requires more than 2 hours. (10)

(ii) Find the probability that a randomly selected furnace repair requires less than 3 hours. (10)

(iii) Find the mean and standard deviation.

- (b) The number of customers arriving at Costa Coffee is Poisson distributed with mean 4. Generate Poisson variate. Use random numbers 0.5389, 0.0532, 0.3492 in sequence. (10)

4. (a) Given the following data for utilization and time spent in system for the Able – Baker carhop problem. Calculate the overall point estimators, standard error and 95% confidence interval for the same. (10)

Given $t_{0.025,3} = 3.18$ (10)

Run r	1	2	3	4
Able's Utilization p_r	0.808	0.875	0.708	0.842
Average system time w_r (mins)	3.74	4.53	3.84	3.98

- (b) What do you understand by calibration and validation of models? How can one increase the face validity of a model and validate the model assumptions. (10)

[TURN OVER

5. (a) Customers arrive at random to the passport center at a rate of 40 customers per hour. (10)
Currently, there are 20 clerks, each serving 4 customers per hour on the average.
Estimate the average utilization of a server and the average number of busy servers.
Can we decrease the number of servers?
- (b) Describe briefly Queueing, Inventory and Reliability systems. (10)
6. Write short notes on (any two): (20)
- (a) Multivariate and Time Series Input Models
- (b) Areas of applications of simulation
- (c) Initialization bias in steady state simulation
- (d) Simulation of Manufacturing & Material Handling System

(10)

(10)

(20)

Software Testing & Quality Assurance
Q. P. Code: 25888

Time: 3 Hours

Total Marks: 80

8/5/18
morning

Note: 1. Question No. 1 is compulsory *

2. Attempt any **three** questions out of remaining five questions.
3. Assume suitable data wherever necessary.
1. (a) Explain Verification in high level and low level design. (05)
(b) Explain need of Automation in Testing (05)
(c) Compare Traditional Software Testing and Web based software testing (05)
(d) Compare progressive and regressive testing (05)
2. (a) Explain in detail Software Testing Life Cycle(STLC) (10)
(b) Explain the difference between failure, fault and error. (10)
3. (a) A program reads an integer number within range [1,100] and determines whether it is prime number or not. Design test cases for this program using BVC, robust testing and worst-case testing method. (10)
(b) Explain issues in Object Oriented Testing. (10)
4. (a) Explain entry and exit criteria for Alpha and Beta testing. How Alpha testing is differ from Beta testing. (10)
(b) Explain need and classification of software matrices. (10)
5. (a) Discuss importance of verification and validation in a project. (10)
(b) Why do we need Integration Testing? Explain its approaches in integration testing. (10)
6. Write short note on (any four) (20)
 - (a) Acceptance Testing
 - (b) Challenges in testing of data ware house
 - (c) Regression Testing
 - (d) Software quality management
 - (e) Efficient Test Suite Management
