

**Information Technology Department**

**Bachelor Of Engineering**

**Question Papers May-June 2019**

**Sem III to VIII**







SEC III) (choice based) (IT) 8th May 2019

Total Marks: 80

Hours: 3 hrs

Note : 1) Question no. 1 is compulsory.

2) Attempt any three questions out of five questions

Q-1

a) If any 11 numbers between 1 and 20 are chosen show that at least two of them will be multiples of each other. (05)

b) A function  $f: R - \left\{\frac{7}{3}\right\} \rightarrow R - \left\{\frac{4}{3}\right\}$  is defined by  $f(x) = \frac{4x-5}{3x-7}$ , Prove that f is bijective and find the rule for  $f^{-1}$ . (05)c) Find  $L\left[\frac{d}{dt}\left(\frac{1-\cos 2t}{t}\right)\right]$  (05)d) Prove that there does not exist an analytic function whose imaginary part is  $3x^2 + \sin x + y^2 + 5y + 4$ . (05)

Q-2

a) Find  $L^{-1}\left[\frac{s}{(s^2+3^2)(s^2+5^2)}\right]$  using convolution Theorem. (06)

b) What is the chance of throwing ten with four dice? (06)

c) In a certain examination there are multiple choice questions. There are four possible answers to each questions and one of them is correct. An intelligent student can solve 90% questions correctly by reasoning and for the remaining 10% questions he gives answer by guessing. A weak student can solve 20% question correctly by reasoning and for the remaining 80% questions he gives answer by guessing. An intelligent student gets the correct answer. What is the probability that he was guessing. (08)

Q-3

a) A can hit a target 2 times in 5 shots, B 3 times in 4 shots, C 2 times in 3 shots. They fire a volley. What is the probability that at least 2 shots hit the target? (06)

b) Find  $L^{-1}\left(\tan^{-1}\left(\frac{2}{s^2}\right)\right)$  (06)c) If R is the relation on the set of integers such that  $aRb$  if and only if  $2a+3b$  is divisible by 5. Find the equivalence classes. (08)

Q-4

a) Evaluate  $\int_{t=0}^{\infty} e^{-3t} \left( \frac{\cos(7t) - \cos(11t)}{t} \right) dt$  (06)b) Find  $L^{-1}\left[\frac{s^2+2s+3}{(s^2+2s+10)(s^2+2s+17)}\right]$  (06)c) Find the bilinear Transformation which maps the points  $2, i, -2$  on to the points  $1, i, -1$ . Also find image of  $|z|=1$  of z-plane to w-plane. (08)

Q-5

a) A family consisting of an old man, 6 adults and 4 children is to be seated in a row for dinner. The children wish to occupy two seats at each end and the old man refuse to have a child on either side of him. In how many ways can the seating arrangement be made for the dinner? (06)

b) Find the analytic function  $f(z) = u + iv$  in terms of  $z$  if  $u - v = (x - y)(x^2 + 4xy + y^2)$ . (06)

c) Solve  $\frac{d^3 y}{dt^3} - 2\frac{d^2 y}{dt^2} + 5\frac{dy}{dt} = 0$  with  $y(0) = 0, y'(0) = 0, y''(0) = 1$ . (08)

Q-6

a) Prove that  $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$  (06)

b) Draw the Hasse diagram of  $D_{105}$ . (06)

c) Find Laplace Transformation of the following

i)  $te^{3t} \operatorname{erf}(5\sqrt{t})$ ,

ii)  $\sin t H(t) + (\cos t - \sin t) H(t - \pi)$  (08)



14/05/19.

S.E. (IT) CBCGS (Choice Base) II Semester

(Time: 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**.

- Q1. Solve any four 20
- Explain DC operating point and its variation with the help of output characteristics of transistor.
  - Convert S-R flip flop to J-K flip flop.
  - Design Ex-OR gate using NAND and NOR gates.
  - Design full subtractor using half subtractor and additional gates.
  - Convert following decimal number to Binary, Octal, Hexadecimal and Gray code  
i)  $(345)_{10}$  ii)  $(818)_{10}$
- Q2. a) Explain collector to base bias Circuit with its stability factor. 10  
 b) Minimize the following four variable logic function using K-map and Design using only NAND gates. 10  

$$f(A,B,C,D) = \sum m(0,1,2,3,5,8,9,10,11,12,14)$$
- Q3. a) Design 4-bit binary to gray code conversion using basic gates. 10  
 b) i) Implement following using only one 8:1 Multiplexer and few gates.  

$$F(A,B,C,D) = \sum m(1,3,4,5,8,9,12,15)$$
  
 ii) With neat logic diagram explain in short operation of Universal Shift Register. 10
- Q4. a) Design a Mod 10 synchronous counter using J-K Flipflop. 10  
 b) Using Quine MC Cluskey Method determine Minimal SOP form for 10  

$$F(A,B,C,D) = \sum m(0,1,2,5,6,7,8,9,10,14)$$
- Q5. a) Explain about ENTITY declarations in VHDL and write VHDL program for NAND and OR gates. 10  
 b) Implement 3 bit asynchronous up counter and also sketch the timing diagram. 10
- Q6. Solve the following- 20
- Explain working of 8:1 Multiplexer.
  - Working of S-R flip flop (with its internal circuit diagram and truth table).
  - Explain working of Constant Current source.
  - Write VHDL program for full subtractor.





20/5/2019

SE (IT) / Sem-III / choice based

Q.P.Code:21841

(3 Hours)

[Marks: 80]

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

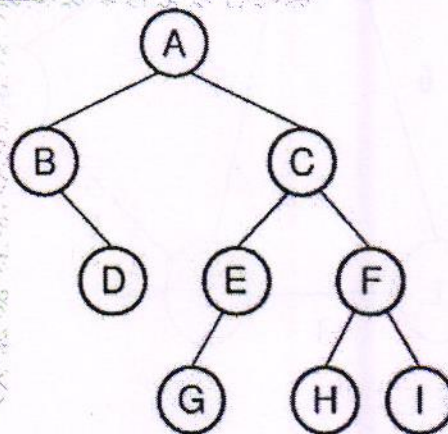
2) Answer any three out of remaining questions.

3) Assume suitable data if necessary.

4) Figures to the right indicate full marks.

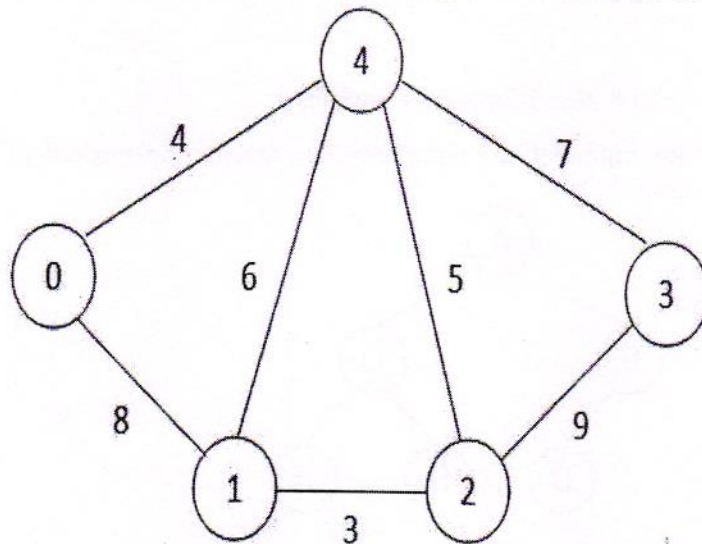
1. (a) Translate the given infix expression in to equivalent postfix expression. 3  

$$(a + b * c - d) / (e * f)$$
- (b) Explain linear and non linear data structures. 3
- (c) What is depth, height and degree of Binary tree. 3
- (d) What are the different ways to represent a graph? 2
- (e) What is linked list? Explain types of linked list. 3
- (f) What is recursion? State its advantages and disadvantages. 3
- (g) Explain asymptotic notations. 3
  
2. (a) Write an algorithm for implementing queue using array. 10
- (b) Write an algorithm for merge sort and comment on its complexity. 10
  
3. (a) Explain BFS and DFS algorithm with examples. 10
- (b) Traverse the following binary tree into preorder, inorder, postorder by giving its algorithm. 10





4. (a) What is Doubly Linked List? Write an algorithm to implement following operations on Doubly linked List. 10  
 (1) Insertion (All cases)  
 (2) Traversal (Forward and Backward)
- (b) What is collision? What are the methods to resolve collision? Explain Linear probing with an example. 10
5. (a) What is Binary search tree. Construct Binary search tree for following elements: 10  
 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18
- (b) Explain Heap sort using an example. Write algorithm for it and comment on its complexity. 10
6. (a) Write an algorithm for implementing stack using array. 10
- (b) What is Minimum Spanning Tree? Draw the MST using kruskal's and prim's algorithm and find out the cost with all intermediate steps. 10



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S.E (IT) sem-III choice based 24/5/2019

(Time: 3Hours)

Marks: 80

- Note: 1) Question no. 1 is compulsory.  
 2) Solve any three out of remaining five questions.  
 3) Assume suitable data wherever necessary.

- Q.1. a) Define Generalization and Specialization. 5  
 b) Compare the traditional file system with Database. 5  
 c) What are the different aggregate functions used in SQL? Explain with the help of examples. 5  
 d) Explain triggers with examples. 5
- Q.2. a) Consider the following schema for institute Library. 10  
 Student ( Rollno, Name, Father\_name, Branch)  
 Book (ISBN, Title, Author, Publisher)  
 Issue ( Rollno, ISBN, Date\_of\_Issue)  
 Write SQL queries for the following statements  
 i. List Roll Number and Name of all students of the branch CSE.  
 ii. Find the name of students who have issued a book published by 'ABC' publisher.  
 iii. List title of all books and their author issued by student 'Prashant'  
 iv. List title of all books issued on or before 1<sup>st</sup> JAN 2014  
 b) Explain the operation on files. 10
- Q.3. a) Define normal forms and explain with suitable example First, Second and Third normal forms. 10  
 b) Discuss the basic operations that can perform using relational algebra. 10
- Q.4. a) Define the following terms 10  
 i. Nested Queries  
 ii. DBA  
 b) Consider a relation R with five attributes ABCDE. You are given the following dependencies: 10  
 $A \rightarrow B$        $BC \rightarrow E$        $ED \rightarrow A$   
 i. List all keys for R  
 ii. Is R in 3NF  
 iii. Is R in BCNF
- Q.5. a) Discuss the different security and authorization mechanisms in Database Management System. 10  
 b) What is SQL Indexes? Explain types of Indexes with examples. 10
- Q.6. a) Define Key Constraints and Referential Constraints. Explain the concept of foreign key with example. 10  
 b) Define the following terms 10  
 i. Weak Entity Set  
 ii. Total Participation  
 iii. Partial Participation  
 iv. Entity Type





SE (I.T.) Sem-III Choice Base

30/5/19

Duration: 3 Hours

Marks: 80

- N.B (1) Question No. 1 is compulsory  
(2) Out of remaining questions attempt three  
(3) Figures to right indicate full marks.

Q1) Solve any four

20 (5\*4)

- With the help of typical values, state various RF bands along with their Applications.
- State Friiss formula & hence determine the overall noise figure in a two Stage cascaded amplifier if each stage has a gain of 10 dB along with a noise figure of 3 dB. (1+4)
- Define Image frequency of AM receiver & hence calculate image frequency Of AM superheterodyne receiver with RF & IF frequencies of 600 KHz & 455 KHz respectively. (1+4)
- Compare PAM, PWM & PPM system.
- Define the following  
(i) Quantization noise (ii) line coding process (iii) inter symbol interference  
(iv) Bit rate (v) Baud Rate
- Explain ground wave propagation in brief

Q2 a) Explain following in relation to radio receiver with suitable figure

1) Selectivity (2) sensitivity (3) double spotting (4) fidelity (10)

b) Explain the principal of TDM with neat diagram. Also explain need of synchronization in TDM. (10) 6+4

Q3 a) What are different sources of noise? Classify & explain various noises that affect Communications. (10)

Q4 a) Explain/define/clarify the following term (10)

- Modulation index in AM
- Modulation index in FM
- Over modulation in AM
- Total power in AM
- Transmission bandwidth in AM & FM

b) State & explain classification of line codes with neat figure (10)

Q5 a) Draw the ASK, PSK & FSK waveforms for digital data 11010101

Also compare all three techniques of modulation (6+4) (10)

b) State and prove following properties of Fourier transforms

1) Time scaling 2) frequency shifting. (10)

Also state significance of these properties in communication system (8+2)



Q6 Write short notes on following: **Any Four**

**20 (5\*4)**

- a) Need of modulation
- b) Ratio detector
- c) Sky wave propagation
- d) Quantization process
- e) FM Noise triangle
- f) Block diagram of analog communication system



SE (IV) (IT) (CBCS) 7th May 2019

Total Marks: 80

Choice Based

Hours: 3 hrs

Note: 1. Question no. 1 is compulsory.

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

Q1. (a) Find the remainder when  $2^{50}$  is divided by 7.

(05)

(b) The probability distribution function of random variable X is

(05)

X	0	1	2	3	4	5	6
P(X=x)	k	3k	5k	7k	9k	11k	13k

Find  $P(x < 4)$ ,  $P(3 < x < 6)$ .

(c) Calculate rank correlation coefficient from the following data.

(05)

Marks in Paper I : 40, 42, 45, 35, 36, 39

Marks in Paper II : 46, 43, 44, 39, 40, 43

(d) Draw the Hasse diagram of Poset  $A = \{2, 3, 6, 12, 24, 36, 72\}$  under the relation of divisibility. Is it Lattice?

(05)

Q2. (a) If x is a Poisson variate such that  $P(x=2) = 9P(x=4) + 90P(x=6)$  then Find mean of x.

(06)

(b) Consider (3,4) parity check code. For each of the following received words determine whether an error will be detected?

(i) 0010 (ii) 1001 (iii) 1101 (iv) 1111

(06)

(c) (i) Using Sieve of Eratosthenes find the prime number upto 150.

(04)

(ii) What is the remainder when following sum divided by 4?

(04)

$$1^5 + 2^5 + 3^5 + \dots + 100^5$$

Q3. (a) Prove that a graph 'G' remains connected after removing an edge 'e' from 'G' iff 'e' is in some circuit of G.

(06)

(b) Marks obtained by students in an examination follow normal distribution. If 30% of students got below 35 marks and 10% got above 60 marks, Find mean and standard deviation.

(06)

(c) Investigate the association between the darkness of eye colour in father and son from the following data.

(08)

Colour of the Son's eyes	Colour of the father's eye		
	Dark	Not dark	Total
Dark	48	90	138
Not Dark	80	782	862
Total	128	872	1000



Q4. (a) Using Euclid's Algorithm find  $x$  and  $y$  satisfying the following. (06)  
 $\gcd(-306, 657) = 306x + 657y$ .

(b) Let  $L = \{1, 2, 3, 5, 6, 10, 15, 30\}$  with divisibility relation. Then show that  $L$  is a Complemented Lattice. (06)

(c) Give an example of a graph which has (08)

- (1) Eulerian circuit but not a hamiltonian circuit.
- (2) Hamiltonian circuit but not an Eulerian circuit
- (3) Both
- (4) None of these two

Q5. (a) Fit Binomial Distribution to the following data (06)

X:	0	1	2	3	4
Frequency:	12	66	109	59	10

(b) Nine items of a sample had the following values 45, 47, 50, 52, 48, 47, 49, 53, 51. Does the mean of 9 items differ significantly from assumed population mean 47.5? (06)

(c) Solve  $x \equiv 1 \pmod{3}, x \equiv 2 \pmod{5}, x \equiv 3 \pmod{7}$  (08)

Q6. (a) Given  $6y = 5x + 90$ ,  $5x = 8y + 30$ ,  $\sigma_x^2 = 16$  (06)  
 Find (i)  $\bar{x}$  and  $\bar{y}$  (ii)  $r$  (iii)  $\sigma_y^2$

(b) Prove that set of cube root of unity is a group under multiplication of complex number. (06)

(c) (i) Prove that  $111^{333} + 333^{111}$  is divisible by 7. (04)

(ii) Find  $5^{-1} \pmod{23}$  (04)



13/05/19.

B.E. IT (Choice Base) Sem IV

[Time: Three Hours]

[ Marks:80]

Note:

- 1) Q.1 is compulsory
- 2) Answer any 3 from Q2-Q6

Q.1. Answer the following (5M each)

- a) Consider five source symbols of a discrete memory less source their probabilities as shown. Follow the Huffman's algorithm to find the codewords for each message:

m1	m2	m3	m4	m5
0.4	0.2	0.2	0.1	0.1

- b) Compare Bus and Star topology  
c) Compare Message Switching and Circuit Switching  
d) Compare LAN,MAN,WAN

Q.2. a) Draw and explain the OSI Reference Model. (10)

Q.2. b) Generate the CRC code for a dataword 110010101. The divisor 10101. Check whether there are errors in the received codeword. (10)

Q.3. a) Explain ALOHA and Slotted ALOHA. (10)

Q.3. b) Compare wired and wireless media. (10)

Q.4. a) Explain the IPV4 header format. (10)

Q.4. b) Compare TCP and UDP. (10)

Q.5. a) What is routing? Explain DVR with an example. (10)

Q.5. b) Explain sliding window protocol. (10)

Q.6. Write short notes on any four: (5M each)

- a) Speech Compression
- b) DNS
- c) Congestion Control
- d) TCP Timers
- e) WWW





SE (IT) / Sem-IV / Choice based  
(3 Hours)

Total Marks: 80

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

2) Solve any Three questions from remaining five.

3) Assume suitable data wherever required.

Q 1) a) Explain race condition with example.

(5)

b) What is thrashing? How is it handled?

(5)

c) What is demand paging? What are the advantages?

(5)

d) Explain the concept of Virtual memory.

(5)

Q 2) a) What is an operating system? What is the need for an operating system? Discuss the

Major functions of an operating system with examples.

(10)

b) Consider a system consisting of  $m$  resources of the same type, being shared by  $n$  processes. Resources can be requested and released by processes only one at a time. Show that the system is deadlock-free if the following two conditions hold:a) The maximum need of each process is between 1 and  $m$  resourcesb) The sum of all maximum needs is less than  $m + n$ .

(10)

Q 3) a) A variable partition memory system has at some point in time the following hole sizes

in the given order:- 20k, 15k, 40k, 60k, 10k, 25k. A new process is to be loaded. Which hole size would be filled using best-fit, first-fit and worst fit respectively?

(10)

b) What problems could occur if a file system is allowed to be mounted simultaneously at more than one location?

(05)

c) Define critical section. What are the requirements to solve critical-section problem?

(05)

Q 4) a) In a variable partition scheme, the OS must keep track of allocation and free space.

Suggest a means to achieve this. Describe an effect of new allocation and process termination in your suggested scheme.

(10)

b) What is the need of Page replacement? Consider the following reference string

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

Find the number of Page Faults with FIFO, Optimal Page replacement and LRU with four free frames which are empty initially. Which algorithm gives the minimum number of page faults?

(10)



Q 5) a) What is paging? How it is different from segmentation? Explain hardware support for paging. (10)

b) What is the critical section problem? What requirement should a solution to critical section problem satisfy? State Peterson's solution and indicate how it satisfies the above requirements. (10)

Q 6) a) Compare the following main memory organization schemes: contiguous memory allocation, pure segmentation, and pure paging with respect to the following issues:

i) External fragmentation ii) Internal fragmentation iii) Ability to share code across processes. (10)

b) Explain the Distributed Processing in Operating Systems. What are the necessary conditions for deadlock? (10)



(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]

a) Compare Computer Organization and Computer Architecture.

b) Explain various pipeline hazards.

c) Differentiate between Hardwired and Micro programmed control unit.

d) Discuss various characteristics of memory.

e) Explain following instructions of 8086 microprocessor –ADC, DAA, MOVSB, LEA, ROL

2. a) Discuss various addressing modes of 8086 microprocessor with example.

10

b) Using Booth's algorithm demonstrates multiplication of  $(-7)*(-6)$ .

10

3. a) Explain concept of DMA in detail.

10

b) Describe various cache memory mapping techniques.

10

4. a) Describe Flynn's classification in detail.

10

b) Divide 13 by 4 using restoring division algorithms.

10

5. a) Describe Minimum modes of 8086 microprocessor in detail.

10

b) Express  $(-10.100)_{10}$  in IEEE 754 single & double precision standard of floating point number representation.

10

6. Write short notes on: (any four)

[04 x 05=20]

a) Segmentation concept of 8086 microprocessor.

b) Cache coherency

c) Von Neumann architecture

d) Programmed I/O

e) Six stage instruction pipeline

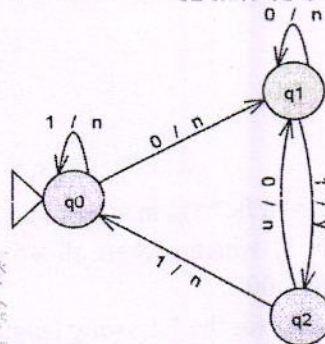




1. Question No. 1 is compulsory.
2. Out of remaining questions, attempt any three questions.
3. Assume suitable data wherever required but justify the same.
4. All questions carry equal marks.
5. Answer to each new question to be started on a fresh page.
6. Figure to the right in brackets indicate full marks.

## 1. Solve any four from the followings.

- (a) Construct Moore machine equivalent to following Mealy machine. [05]



- (b) Construct a PDA for the following Context Free Grammar (CFG). [05]

$$S \rightarrow CBAA$$

$$A \rightarrow 0A0 \mid 0$$

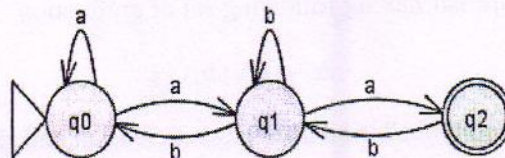
$$B \rightarrow 0B \mid 0$$

$$C \rightarrow 0C1 \mid 1C0 \mid \epsilon$$

- (c) Construct right linear grammar and left linear grammar for the regular expression
- $1(01)^*0(0+1)^*$
- . [05]

- (d) Explain the concepts, acceptance by final state and acceptance by empty stack of a Pushdown automata with suitable example. [05]

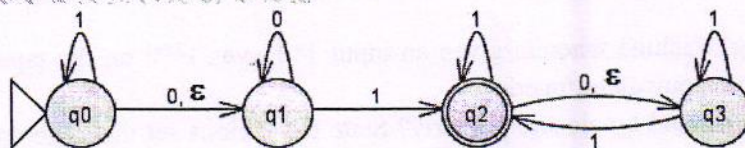
- (e) Construct regular expression for the following FA using state elimination method. [05]



## 2. (a) Write down the regular expressions for the following language. [04]

- i. L is the language of all strings over  $\{0, 1\}$  having odd number of 0's and any number of 1's.
- ii. L is the language of all strings over  $\{0, 1\}$  having number of 1's multiple of three.

- (b) Construct DFA for the following NFA with
- $\epsilon$
- moves. [10]



- (c) Construct NFA with
- $\epsilon$
- moves for the regular expression
- $ab^*(a+b)^*+ba^*$
- . [06]



3. (a) Convert the following context free grammar into Chomsky normal form. [10]

$$S \rightarrow A | C \quad A \rightarrow aA | a | B \quad B \rightarrow bB | b | \epsilon \quad C \rightarrow cC | c | B$$

- (b) Construct a Context Free Grammar (CFG) for the following PDA. [10]

$M = (\{q_0, q_1\}, \{ (, ), [, ] \}, \{ (, [, Z_0 \}, \delta, q_0, Z_0, \Phi)$  and  $\delta$  is given by:

$$\delta(q_0, (, Z_0) = (q_0, [Z_0)$$

$$\delta(q_0, [, Z_0) = (q_0, [Z_0)$$

$$\delta(q_0, (, () = (q_0, (($$

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$$\delta(q_0, ), () = (q_0, \epsilon)$$

$$\delta(q_0, ], [] = (q_0, \epsilon)$$

$$\delta(q_0, \epsilon, Z_0) = (q_1, \epsilon)$$

4. (a) Construct a PDA for  $L = \{a^n b c^m \mid n, m \geq 1 \text{ and } n < m\}$ . [10]

- (b) Design a DFA over  $\{0, 1\}$  which accepts all strings that contain substring '11' and do not contain the substring '00'. [06]

- (c) Give context free grammar for the following languages. [04]

i.  $L = \{0^n 1^m 0^k \mid m > n + k \text{ and } n, m, k \geq 0\}$

ii.  $L = \{a^{2n} b^{3m} c^{m} d^n \mid n, m \geq 1\}$

5. (a) Construct Turing Machine to accept language  $L = \{a^n b^{2n+1} \mid n \geq 1\}$ . [10]

- (b) Find the equivalent NFA with  $\epsilon$ -moves accepting the regular language defined by the following grammar. [05]

$$S \rightarrow 01S \mid 0A \quad A \rightarrow 10 \mid 1B \mid 00A \quad B \rightarrow 1S \mid 1B \mid \epsilon$$

- (c) Let  $G$  be the grammar having following set of production. [05]

$$S \rightarrow ABA \quad A \rightarrow aA \mid bA \mid \epsilon \quad B \rightarrow bbb$$

For the string "ababbbba", find a leftmost derivation and rightmost derivation.

6. (a) Minimize the following DFA  $M = (\{q_0, q_1, q_2, q_3, q_4, q_5\}, \{0, 1\}, \delta, q_0, \{q_3, q_5\})$ , where  $\delta$  is given in the following table. [06]

	$\rightarrow q_0$	$q_1$	$q_2$	$*q_3$	$q_4$	$*q_5$
0	$q_1$	$q_3$	$q_5$	$q_3$	$q_5$	$q_3$
1	$q_2$	$q_4$	$q_1$	$q_4$	$q_1$	$q_4$

- (b) Construct Turing Machine wherein given an input  $1^n$  leaves  $1^{3n+1}$  on the tape. Convert the TM design into equivalent function. [10]

- (c) What do you understand by closure property? State the various set theoretic operations under which regular languages are closed. Give suitable example. [04]



TECV) C choice Based Time: 3 Hours (IT)

Marks: 80

9th May 2019

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

2. Solve any **three** questions out of remaining five questions.

3. Assume suitable data if necessary.

4. Figures to right indicate marks.

Q. 1. Solve any **four** out of five.

(4\*5=20)

a. Explain the significance of bits of CPSR of ARM7.

b. Discuss the major application areas of an Embedded System.

c. Draw the functional pin diagram of ADC 0808.

d. Differentiate between Real-Time Operating System and General Purpose Operating System.

e. Explain the instructions of 8051 microcontroller – MOVX, ADC, SJMP, ANL, JNB

Q. 2. a) Briefly explain about Inter Process Communication.

(10)

b) Write assembly language program for 8051 to find number of positive and negative numbers from a given ten 8 bit numbers stored from 50H. Store result at 60H (no of positive numbers) and 61H(no of negative numbers).

(10)

Q. 3. a) Draw and explain the functional block diagram of 8255 Programmable Peripheral Interface.

(10)

b) Discuss the various operating modes of ARM7 processor.

(10)

Q. 4. a) Compare the features of Arduino and Raspberry Pi embedded target boards.

(10)

b) Explain the SFRs- TMOD, IE & SCON.

(10)

Q. 5. a) Explain different addressing modes of single register load/store instruction of ARM7 processor.

(10)

b) Demonstrate with example, the scheduling algorithms used in RTOS.

(10)

Q. 6. a) What are sensors used in IoT applications with the target embedded boards for measuring temperature, pressure and humidity? Explain the same.

(05)

b) Discuss the interrupt structure of 8051 microcontroller.

(08)

c) Discuss various embedded microcontroller cores used in embedded System.- RICS, CISC, ARM and DSP

(07)





15/05/19.

T.E (I.T.) CBCGS Sem V

(3 Hours)

[Total Marks: 80]

**N.B.**

- 1) Question No. 1 is compulsory
- 2) Solve any three questions out of the remaining five questions.

- 1
  - a) Draw and illustrate 3-tier Web Architecture. (5)
  - b) What are the characteristics of Rich Internet Application? (5)
  - c) Explain string functions in PHP. (5)
  - d) Explain UDDI. (5)
- 2
  - a) Explain Geo-location and media query with an example in HTML5 and CSS3. (10)
  - b) Create a HTML form to accept name (TextField), address (TextArea), gender (Radio), and Country (DropDown) fields from user, store it into the My SQL database using PHP program. (10)
- 3
  - a) Write an external stylesheet and link it with HTML code. The stylesheet should include the following (10)
    - i. The web page will have the background image "img1.jpg".
    - ii. The table headings will have red background color.
    - iii. Background color of alternate paragraphs are different.
    - iv. The hyperlinks on the web page will not have underline.
  - b) Draw the diagram for AJAX Web application model and Traditional Web application model and compare them. (10)
- 4
  - a) Design a web page to maintain a Library Catalogue using XML. It should maintain the name of the book, author, publisher, and year of publishing. Format it in the tabular manner using XSLT. (10)
  - b) Explain "Window" object of JavaScript DOM. Write a JavaScript code to change the background color of the webpage automatically after every 5 seconds. (10)
- 5
  - a) Write code to process online Alumni information for your college. Create forms to get name, address, date of birth, and email id. Use check boxes for taking hobbies and radio buttons for selecting branch. Write JavaScript code to validate the following: (10)
    - i. User has filled all the fields prior to form submission
    - ii. Valid email-id (with '@' and '.')
    - iii. Age validation using DOB ( $\geq 22$  years)
  - b) Write HTML5 code for embedding the audio and video elements in the web page. (10)
- 6
  - a) Explain in detail JSON mash ups with neat diagram. (8)
  - b) Explain the role of a cookie and differentiate it from sessions. Write a PHP script to check whether the cookie is set or not. (6)
  - c) Explain the features and applications of Django. (6)

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## TE(IT) / sem-V / choice Based

(Time: 3 Hrs)

Marks: 80

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

2. Solve any **Three** questions out of remaining **Five** questions.Qu-1 Attempt any **FOUR** of the following.

- a) Write short note on "Query Evaluation Plan" 5
- b) Justify the statement "Collections of operations that form a single logical unit of work are called Transactions." 5
- c) List and explain the commonly accepted security goals for databases. 5
- d) List the Distribution Design Issues and explain any one in detail. 5
- e) List and explain basic tasks involved in Data Transformation. 5

- Qu-2 a) Show that the two-phase locking protocol ensures conflict serializability, and that transactions can be serialized according to their lock points. 10
- b) Explain generic layering scheme for Distributed Query Processing. 10

- Qu-3 a) Explain Temporal databases with suitable example. 10
- b) List and explain any four OLAP Operations in a cube with suitable example. 10

- Qu-4 a) What is the general purpose of the Data-warehouse architecture? Explain the architectural components of Data-warehouse with suitable diagram. 10
- b) List various fragmentation strategies in distributed database and explain any one in detail. 10

- Qu-5 a) List and explain the types of activities and tasks that compose the ETL process. 10
- b) Explain ARIES Algorithm in detail. 10

Qu-6 Attempt the following.

- a) Measures of Query Cost. 5
- b) Shadow Paging. 5
- c) Mobile Databases. 5
- d) Factless Fact Table. 5

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Time (3 Hours)

[Total Marks 80]

N. B:

1. Question No. 1 is Compulsory.
2. Solve any THREE from Question No. 2 to 6.
3. Draw neat well labeled diagram wherever necessary.

- Q. 1 a) A secure e-voting system is to be designed. Discuss the security goals that must be met and enlist mechanisms for the same. (5)
- b) What is the drawback of Double DES algorithm? How is it overcome by Triple DES? (5)
- c) Define ARP spoofing with an example. Compare with IP spoofing. (5)
- d) What is the significance of a digital signature on a certificate? Justify (5)
- Q. 2 a) Encrypt "This is the final exam" with Playfair cipher using key "Guidance". Explain the steps involved. (10)
- b) Compare and contrast DES and AES. (10)
- Q. 3 a) Two users wish to establish a secure communication channel and exchange a session key after mutual authentication. Show how this can be done with the help of a KDC. (10)
- b) Given modulus  $n=221$  and public key,  $e=7$ , find the values of  $p$ ,  $q$ ,  $\phi(n)$ , and  $d$  using RSA. Encrypt  $M=5$ . (10)
- Q. 4 a) Define DOS attack. Show the different ways by which this attack can be mounted at various layers. (10)
- b) Show how Kerberos protocol can be used to achieve single sign-on in distributed systems (10)
- Q. 5 a) A user wishes to do online transactions with Amazon.com. Discuss a protocol which can be used to set up a secure communication channel and provide server side and client side authentication. Show the steps involved in the handshake process. (10)
- b) What is a firewall? Explain different types of firewalls and list their advantages. (10)
- Q. 6 a) Write short notes on (any two): i) Email security ii) Diffie Hellman algorithm iii) El-Gamal Algorithm (10)
- Q. 6 b) How does IPSec help to achieve authentication and confidentiality? Justify the need of AH and ESP. (10)

\*\*\*\*\*





Note: Question No 1 is compulsory

Attempt any 3 questions from remaining.

Assume suitable data whenever necessary

- 
- Q1. You are appointed as developer of e-comm website for Online business Portal. Design and develop website to promote the same. 20
- Q2 A) Discuss security aspects in E-commerce 10  
B) Explain Architecture of SET protocol 10
- Q3 A) Suggest strategies to migrate traditional business to online business. 10  
B) What are the different ways for electronic marketing? 10
- Q4 A) What is value chain process in E-comm? Discuss with diagram 10  
B) Discuss Technology and infrastructure in e-business 10
- Q5 A) What is Smart Card? Explain in detail 10  
B) Discuss SCM with example 10
- Q6 A) Discuss CRM strategy based on B-C Model 10  
B) What do you mean by EDI? Explain in detail. 10
-





TECIT)(VI) (choice based) 10th May 2019

[Time: 3 Hours]

[ Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question No 1 is compulsory.
  2. Write any **three** questions out of remaining.
  3. Assume suitable data If required.

- Q.1
- a) What is software engineering? Explain RAD model with diagram. 5
  - b) Explain elements of analysis model. 5
  - c) Differentiate between alpha testing and beta testing. 5
  - d) Draw a complete use case for anyone of the following activities. 5
    - I. Buying a stock using an online brokerage account.
    - II. Using your charge card for a meal at a restaurant.
- Q.2
- a) Explain agile methodology using serum with diagram. 10
  - b) Prepare a complete SRS for online job recruitment system. 10
- Q.3
- a) Explain use case based cost estimation in detail. 10
  - b) Draw the state chart diagram and activity diagram for ATM system. 10
- Q.4
- a) What is quality? Explain McCall's Quality factors. List six quality attributes for ISO 9126. 10
  - b) Write a short note on SCM process and explain how change control and version Control are carried out in SCM. 10
- Q.5
- a) Enumerate PMBOK Knowledge areas. 10
  - b) Define risk and explain IT project risk management processes. 5
  - c) Draw activity on node and activity on arrow diagram based on following activities of a project and their interrelationships shown in following table. 5

Activity	Predecessor Activity
A	-
B	-
C	A
D	A,B
E	C
F	C
G	D,E
H	F,G

Q.6

- a) A project manager and team came up with the estimates as presented in table 1.1. Draw an activity on node diagram based on predecessors given, calculate expected duration for each activity and calculate and find the critical path.

10

Table 1.1: Activity Analysis for PERT

Activity	Predecessor	Optimistic Estimates (days) a	Most Likely Estimates (days) b	Pessimistic Estimates (days) c
A	None	1	2	4
B	A	3	5	8
C	B	2	4	5
D	B	2	3	6
E	B	1	1	1
F	C,D	2	4	6
G	D,E	2	3	4
H	F,G	1	2	5
I	G	4	5	9
J	H,I	0.5	1	3

- b) What is a Business case? State the steps in developing the business case.

10

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TE (I.T.) (Sem - VI) / choice based

(3 Hours)

[Total Marks:80]

- NB:** 1. Question no. 1 is compulsory.  
 2. Answer any **three** out of the **remaining** questions.  
 3. Assume data, if missing, with justification.

**Q.1.(a)** Apply K-means Algorithm to divide the given set of values {2,3,6,8,9,12,15,18,22} into 3 clusters [05]

**(b)** Explain Confusion Matrix. Calculate Accuracy, Precision and Recall for the following Confusion Matrix [05]

Cancer Classes	Yes	No	Total
Yes	90	210	300
No	140	9560	9700
Total	230	9770	10000

**(c)** What are the major issues in data mining? [05]

**(d)** What is noisy data? How to handle it? [05]

**Q.2.(a)** Consider the transaction database given in table below. Apply Apriori Algorithm with minimum support of 50% and confidence of 50%. Find all frequent itemsets and all the association rules. [10]

Tid	Items
100	1,3,4
200	2,3,5
300	1,2,3,5
400	2,5
500	1,2,3
600	3,5
700	1,2,3,5
800	1,5
900	1,3

**(b)** Explain Regression. Explain linear regression with example. [10]

**Q.3.(a)** Suppose we have five objects with name A, B, C, D and E. Apply single linkage clustering and draw dendrogram for the given data. [10]

	X	Y
A	1	1
B	1.5	1.5
C	5	5
D	3	4
E	4	4
F	3	3.5

**(b)** What is an outlier? Describe methods that are used for outlier analysis. [10]



- Q4.(a) Using the given training dataset classify the following tuple using Naïve Bayes Algorithm: [10]  
 <Homeowner: No, Marital Status: Married, Job experience:3>

Homeowner	Marital Status	Job experience (in years)	Defaulted
Yes	Single	3	No
No	Married	4	No
No	Single	5	No
Yes	Married	4	No
No	Divorced	2	Yes
No	Married	4	No
Yes	Divorced	2	No
No	Married	3	Yes
No	Married	3	No
Yes	Single	2	Yes

- (b) Explain Business Intelligence issues. [10]
- Q5. (a) What is data mining? Explain KDD process with diagram. [10]
- (b) Explain Market-Basket analysis with example. [10]
- Q6. (a) What are multiple level and multidimensional association rules? Explain with suitable examples for each. [10]
- (b) Suppose that data for analysis includes the attribute age. The age values for data tuples are (in increasing order): [10]  
 13,15,16,16,19,20,20,21,22,22,25,25,25,25,30,33,33,35,35,35,35,36,40,45,46,52,70  
 i) What is mean of data? What is median of data?  
 ii) What is mode of data? Comment on data's modality.  
 iii) What is mid-range of data?  
 iv) Give the five- point summary of the data.  
 v) Show box plot of the data.

\*\*\*\*\*



(3 hours)

[80 marks]

NOTE: Question No 1 is compulsory. Attempt any three questions from remaining.  
Assume suitable data if necessary.  
Draw neat labelled diagrams wherever needed.

- Q.1. a) Explain the NIST cloud model. 10M
- b) State the significance of hypervisors and explain type 1 and type 2 hypervisors in detail. 10M
- Q.2. a) Explain the implementation levels of virtualization 10M
- b) Explain the SPI cloud service model. 10M
- Q.3. a) Explain the components and architecture of openstack. 10M
- b) Explain Google file System in detail. 10M
- Q.4. a) Differentiate between AWS S3 storage and Glacier Storage. 10M
- b) What are the types of instances of Amazon EC2? Explain the AWS EC2 instance life cycle. 10M
- Q.5. a) Compare AWS and openstack with respect to type of deployment, services supported and their components. 10M
- b) Explain the significance of network interface, security group and ACL for Amazon VPC. 10M
- Q.6. Write Short Notes on: (Any Four) 20M
- Cloud Cube Model
  - Anything as a service
  - Benefits and challenges of mobile cloud computing
  - Virtualization Taxonomy
  - Cloud Storage Gateway
  - Cloud Watch





T.E (IT) sem-VI choice based 28/05/2019

(3 Hours)

[80 marks]

Note: Question No.1 is compulsory

Answer any three questions out of any remaining five questions

Figures in right indicate marks

Diagrams to be drawn neatly & should be legible

- 
- Q1 a) The channel data rate is 270.833kbps in GSM standard that is 40% of theoretical maximum data rate that can be supported in a 200kHz channel bandwidth. Calculate the corresponding theoretical S/N required. [4]
- b) Write in brief about WLAN technology and discuss about Hidden exposed terminal problem in WLAN. [4]
- c) Explain frequency reuse concept with neat diagram and state the mechanism to calculate frequency re-use distance  $q$ . [4]
- d) Write about the GSM logical channel hierarchy in detail. [4]
- e) Discuss about UMTS 3G security with neat flow diagram. [4]
- Q2.a) Write in detail the working of Reverse link CDMA system.  
In an IS-95 system calculate the processing gain in dB if the baseband data rate is 9.6kbps, 4.8kbps, 2.4kbps & 1.2 kbps in rate set 1. If the error correction codes increase the data rate to 19.2kbps, recalculate the processing gain. Comment on the results obtained. [10]
- Q2.b) Explain with neat diagram about DSSS technique in detail with types of spread spectrum. [10]
- Q3. a) Explain the working of WEP protocol in detail with neat diagram. [10]
- Q3. b) Write in detail about the need of internet firewalls for trusted system in wireless networks. [10]
- Q4. a) Draw and explain the GPRS architecture in detail with neat diagram. [10]
- Q4. b) Discuss and compare between MANET & VANET architecture with its applications. [10]
- Q5. a) A mobile communication system is allocated RF spectrum of 25 MHz and uses RF channel bandwidth of 25 kHz so that a total number of 1000 voice channels can be supported in the system.  
i) If the cell service area is divide into 20 cells with a frequency reuse factor of  $A$ , calculate the system capacity.  
ii) The cell size is reduced to the extent that the service area is now covered with 100 cells. Compute the system capacity while keeping the frequency reuse factor as 4. [10]
- Q5. b) Explain in detail the working of forward link CDMA system with neat diagram. [10]
- Q6. Write in detail on any four of the following: [20]
- a) UMTS Architecture
  - b) wireless sensor network architecture
  - c) Bluetooth architecture
  - d) A 5/1 of GSM architecture
  - e) WPAN 802.15.1 standard
-





T.E. IT, Choice base 03/05/2019

(3 Hours)

Marks: 80

- Note: 1) Question 1 is compulsory.  
2) Attempt any three from remaining Questions.  
3) Assume suitable data wherever necessary.  
4) Figure indicates marks.

- Q1. A) Describe the steps involved in ethical hacking. [05]  
B) What is Digital Forensics? Explain types of Digital Forensics? [05]  
C) Discuss the challenges in Web Application Forensics? [05]  
D) Explain how to use the routers as response tools? [05]
- Q2. A) Describe the incident response methodology in detail. [10]  
B) Discuss in detail Ethics in Digital Forensics. [10]
- Q3. A) What is digital evidence? Explain in detail types of digit evidences? [10]  
B) Explain in detail collecting Volatile and Non-Volatile Data in Unix-Based Systems. [10]
- Q4. A) Describe in detail Investigating Web Browsers. [10]  
B) Discuss in detail Partitioning and Disk Layouts. [10]
- Q5. A) What is Intrusion Detection systems? Explain in detail types of IDS. [10]  
B) List and explain different types of computer forensic tools. [10]
- Q6. Write Short notes [20]  
a) Challenges for Evidence Handling.  
b) Live Data Acquisition  
c) RAID  
d) Analyzing Network Traffic
-





B'E. (VII) CCBSCS (IT) 7th May 2019

[Time: 3 Hours]

[Marks:80]

- Please check whether you have got the right question paper.
- N.B:
1. Question No. 1 is compulsory
  2. Attempt any Three questions out of remaining.
  3. Assume suitable data if required.

**Q. 1 Solve any Four:**

- a) What are the attributes of a project? (05)
- b) Describe project life cycle and its relation with SDLC. (05)
- c) What are the advantages of having and following a project methodology? (05)
- d) Explain why a project's scope must be tied to the WBS. (05)
- e) Describe various stakeholders involved in the project. (05)

- Q. 2**
- a) Describe the five phases of IT project Methodology. (10)
  - b) Suppose you are the project manager of a large software development project. List three common types of risks that your project might suffer? Point out the main steps that you would follow to effectively manage risks in your project (10)

- Q. 3**
- a) Explain work breakdown structure with example. (10)
  - b) Difference between open and closed system. (05)
  - c) Describe the relation between MOV, scope and WBS. (05)

- Q. 4**
- a) Distinguish Resource loading from Resource levelling. Why is levelling of resources preferred to large fluctuations? (10)
  - b) As a project manager, identify the characteristics that you would look for in a Software developer while trying to select personnel for your team. (10)

- Q. 5**
- a) Explain the advantages of a functional organization over a project organization. Also explain why software development houses prefer to use project organization over functional organization (10)
  - b) What is outsourcing? Explain in brief the objectives of procurement management. (10)

- Q. 6**
- a) Consider the following project details as shown in table 1 and field report at the end of Day7 as shown in table 2, At the end of day 7, find (15)

- 1) ACWP(AC)
- 2) BCWP(EV)
- 3) BCWS(PV)
- 4) CV
- 5) CPI
- 6) SPI
- 7) SV



Table 1

Activity	Predecessor	Duration (days)	Cost/Day	Total Cost
A	-	2	300	600
B	A	3	400	1200
C	B	3	400	1200
D	B	2	200	400
E	D	3	100	300

Table 2

Field report at end of day 7		
Activity	Actual % Complete	Incurred Cost
A	100	600
B	100	1400
C	33	500
D	50	200
E	0	0

b) Explain the steps involved in terminating a project.

(05)

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B.E. IT (CBSSGS) VII Semester

Date :- 13/05/19

Marks- 80

Duration – 3hrs

N.B. (1) Question no. 1 is compulsory.

(2) Attempt any three from remaining five questions.

(3) Assume suitable data, if necessary.

- Q1. a. Compare Public and Community Cloud. 05  
 b. Explain SPI model of cloud computing. 05  
 c. What are the differences between ASP and SaaS? 05  
 d. Write key challenges in design and development of cloud applications. 05
- Q 2. a. Explain GFS Architecture and benefits. 10  
 b. Explain the following w.r.t Eucalyptus 10  
 i) Features  
 ii) Architecture  
 iii) Elastic IP  
 iv) Security Groups
- Q3. a. Explain Architecture of any bare metal hypervisor in detail 10  
 b. Explain Gartner's data Security challenges along with mitigation techniques. 10
- Q4. a. Explain different cloud computing risks and benefits of Virtualization. 10  
 b. Explain public cloud adoption phases for SMBs and responsibilities of cloud Vendor towards SMBs. 10
- Q5. a. Discuss the fundamental requirements for cloud application architecture. 10  
 b. Explain the Architecture of mobile cloud computing and Issue with Security as a Service. 10
- Q6. Write a note on 20  
 1. AAA model  
 2. Cloud Service Brokerage  
 3. Amazon EC2  
 4. Google Big table

\*\*\*\*\*

70646



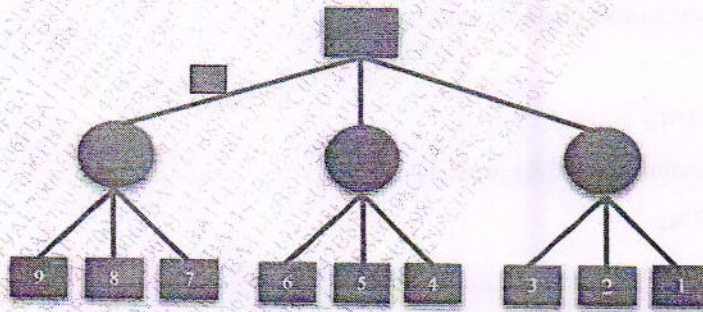


(Time: 3 Hours)

Total Marks:80

- N.B.: (1) Question No. 1 is compulsory.  
(2) Attempt any three out of remaining five.

- Q1. a) What is PEAS descriptor? Give PEAS Descriptor for Taxi Driver. 4  
b) Write a note on conditional probability and its role in AI. 4  
c) Solve following Cryptarithmic problem  
SEND+MORE=MONEY 4  
d) Differentiate between propositional and predicate logic. 4  
e) Explain Expert system Shell in short. 4
- Q2. a) Given a full 4-gallon jug and an empty 3-gallon jug, the goal is to fill the 4-gallon jug with exactly 2-gallons of water. Give state space representation. 10  
b) Explain Hill Climbing and its Drawback in details. 5  
c) Explain A\* Algorithm with an example. 5
- Q3. a) Consider the given game tree. Apply Alpha beta Pruning on following example where - max node, ● -min node 10



- b) Draw and Explain the Expert System Architecture. 5  
c) Formulate the state space search problems for 8 puzzle problem. 5



- Q4. a) Illustrate the Resolution Proof 10
- The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American.
- (i) Represent the above sentences in first order predicate logic (FOPL).
- (ii) Convert them to clause form.
- (iii) Prove that "Colonel West is a criminal" using resolution technique.
- b) Give the comparative analysis of BFS, DFS, Depth Limit, Iterative deepening and Bidirectional search strategies with respect to Time Complexity, Space Complexity, Optimality and Completeness. 5
- c) List Down all types of Agents. Explain Learning agent with block diagram. 5
- Q5. a) Write a prolog program for Factorial. 5
- b) Represent the following sentence into FOPL. 10
- (i) Everyone who loves all animals is loved by someone.
- (ii) Ravi likes all kind of food.
- (iii) Every gardener likes the sun.
- (iv) Everybody loves somebody.
- (v) Apples are food.
- c) Explain a partial order planning with example. 5
- Q6. Write short notes on (Any Four): 20
- a) Forward chaining and Backward chaining
- b) Decision Tree
- c) Bayes theorem
- d) Inductive Learning and Rote Learning
- e) Properties of Agent Task Environment



BE (I.T.) sem - VII CB S G S

29/5/19.

(3 Hours)

Total Marks: 80

- Note: i) Question no. 1 is compulsory  
 ii) Attempt any three from remaining  
 iii) Assume necessary data

1. (a) Discuss the usability engineering life cycle. 10  
 (b) With help of an example explain the importance of graphics design and color while developing an application. 10
2. (a) Explain categories of users and individual user differences 10  
 (b) Explain prototyping with example 10
3. (a) How user memory load can be minimized 10  
 (b) Explain heuristic evaluation. 10
4. (a) Explain test tasks to be performed and stages of test. 10  
 (b) How performance measurement is used for usability testing 10
5. (a) How usability assessment can be done without using testing 10  
 (b) Discuss guidelines for internationalization. 10
6. Write short note on 20
  - a) CAUSE Tool
  - b) Usability slogans
  - c) Usability Laboratories
  - d) Consistency





BE (VIII) C (BSCS) (IT) 8th May 2019

(Time: 3 Hours)

Total Marks: 80

Note: 1) Question no. 1 is compulsory.

2) Solve any three out of remaining five questions.

3) Assume suitable data wherever necessary.

Q.1. a) Define software testing. Explain software testing model with a neat diagram. (05)

b) Classify bugs based on SDLC. (05)

c) Is white-box testing really necessary? Give reasons. (05)

d) "Regression testing produces quality software". Justify with reasons. (05)

Q.2. a) What are the features of V-testing model? Explain in detail. (10)

b) Which type of testing is possible with equivalence class partitioning? (10)

A program takes an angle as input within the range [0,360] and determines in which quadrant the angle lies. Design test cases using equivalence class partitioning method.

Q.3. a) Consider the following program for calculating the factorial of a number. It consists of main() program and the module fact(). Calculate the individual cyclomatic complexity number for main() and fact() and then the cyclomatic complexity for the whole program. Draw DD graph. List all independent paths and design test cases from independent paths.

```
main()
{
    int number;
    int fact();
    clrscr();
    printf("enter the number whose factorial is to be found out");
    scanf("%d", & number);
    if (number < 0)
        printf("factorial cannot be defined for this number");
    else
        printf("factorial is %d", fact(number));
}

int fact( int number )
{
    int index;
    int product=1;
    for ( index=1; index<=number; index++)
```



```

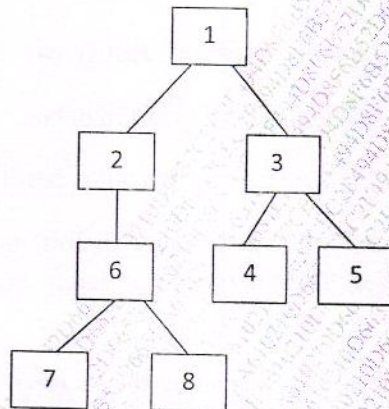
    product=product*index;
    return(product);
}

```

b) Describe types of static testing in detail. (10)

Q.4. a) Why do we need integration testing? (10)

Perform top-down and bottom-up integration procedure from the following system hierarchy.



b) What is the need for software measurement? Discuss various types of software metrics. (10)

Q.5.a) What are the components of a test plan. Illustrate test plan hierarchy with a neat diagram. (10)

b) Describe the procedure for Test Point Analysis (TPA) with a neat diagram. (10)

Q.6. Write a short on any two. (20)

- Software Quality Measurement.
- Object Oriented Software testing.
- Web based system testing.



B.E.(IT)

Sem VII

CBSCS

Date: - 14/05/19.

Please check whether you have got the right question paper.

- N.B:
1. Question number 1 is compulsory. Solve any three out of remaining.
  2. Draw neat diagrams.
  3. Illustrations may be given as required.

- Q.1 a) What is zoning? Discuss a scenario, 10
1. where soft zoning is preferred over hard zoning
  2. where hard zoning is preferred over soft zoning
- b) Seventeen switches, with 16 ports each, are connected in a mesh topology. How many ports are available for host and storage connectivity if you create a high availability solution? 10
- Q.2 (a) Discuss the various factors that affect the NAS performance and availability in detail. 10
- (b) What is meant by seek time, rotational latency and utilization in case of disk drive 10
- Q.3 (a) Explain logical components of connectivity in storage system environment 10
- (b) What is meant by business continuity, information availability, disaster recovery and recovery point objective? 10
- Q.4 (a) Compare the shadow paging recovery scheme with the log-based recovery schemes in terms of ease of implementation and overhead cost. 10
- (b) List the advantages, disadvantages of RAID level 0, 1, 5 10
- Q.5 a) Compare NAS, FCSAN and iSCSI SAN 10
- b) Explain information lifecycle. What are the key challenges in managing information? 10
- Q.6 a) Explain NAS file sharing protocol. 10
- b) Explain the properties information storage and retrieval systems. 10

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BE(IT) / Sem - VIII / CBS QS

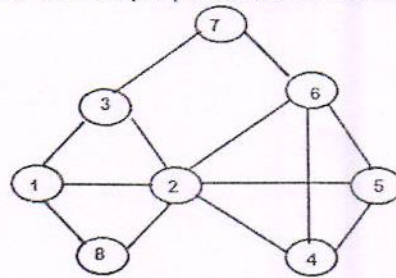
(Time: 3 Hrs)

Marks: 80

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

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

- Q.1. (a) Explain Blooms filter for stream data mining. (5)  
 (b) Find the jaccard distance and cosine distance between the following pairs of set: (5)  
 $X=(0,1,2,4,5,3)$  and  $Y=(5,6,7,9,10,8)$ .  
 (c) Explain the steps of the HITS algorithm. (5)  
 (d) Explain "Shuffle & Sort" phase and "Reducer Phase" in Map Reduce. (5)
- Q.2. (a) Write a Map reduce pseudo code to multiply two matrices. Illustrate with an example showing all the steps. (10)  
 (b) Explain Hadoop Ecosystem with core components. Explain its physical architecture. State the limitations of Hadoop. (10)
- Q.3. (a) Suppose a data stream consists of the integers 1,3,2,1,2,3,4,3,1,2,3,1. Let the Hash function being used is  $h(x) = (6x+1) \bmod 5$ ; estimate the number of distinct in this stream using Flajolet - Martin algorithm. (10)  
 (b) Distinguish the following: (10)  
 a) PCY, Multistage  
 b) Document data store and Column family data store
- Q.4. (a) Give two applications for counting the number of 1's in a long stream of binary values. Using a stream of binary digits, Illustrate how DGIM will find the number of 1's. (10)  
 (b) For the given graph show how clique percolation method will find cliques. (10)



- Q.5. (a) Consider the web graph given below with six pages (A, B, C, D, E, F) with directed links as follows. (10)  
 $A \rightarrow B, C$   
 $B \rightarrow A, D, E, F$   
 $C \rightarrow A, F$   
 Assume that the PageRank values for any page  $m$  at iteration 0 is  $PR(m)=1$  and teleportation factor for iterations is  $\beta=0.85$ . Perform the page rank algorithm and determine the rank for every page at iteration 2.
- (b) Explain clearly how the SON partition based algorithm helps to perform frequent item set mining for large data sets. How does this algorithm avoid false negatives? (10)
- Q.6. (a) Explain collaborative filtering system. How is it different from content based system? (10)  
 (b) Clearly explain how CURE algorithm can be used to cluster big data sets. (10)





B.E (IT) Sem - VIII CBSSGS 24/5/2019

(3 Hours)

[Total Marks: 80]

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) Define Simulation. With the help of neat flowchart, explain the steps in simulation study. (10)  
 (b) A sequence of 1000 three-digit numbers has been generated and an analyst indicates that 290 have three different digits, 570 contain exactly one pair of like digits, and 140 contain exactly three like digits. Based on Poker test, check whether these numbers are independent. Use  $\alpha = 0.05$  and  $\chi^2_{0.05,2} = 5.99$ . (10)

2. (a) The inter-arrival time and the service times of the 10 jobs arriving in the computer system are given as follows: (10)

Inter-arrival time (min)	--	0	60	60	120	0	60	120	0	120
Service time (min)	25	50	37	45	50	62	43	48	52	38

Compute the following:

- Average time job spends in the queue.
  - Average processing time of the jobs.
  - Maximum time job spends in the system.
- (b) If the inter-arrival time ranges from 2 to 6 minutes with equal probability and the random digits generated are 51, 27, 63, 89, 11, and 45 with a uniform service time of 3 minutes, generate the FEL with primary events. Also calculate the total busy time of the server and the minimum queue length. (10)
3. (a) Explain Poisson process and state its properties. Gaurav is quite a popular student. He receives, on the average, four phone calls a night with Poisson distribution. What is the probability that tomorrow night the number of calls received will exceed that average by more than one standard deviation? (10)
- (b) Design a generator for the discrete distribution whose pmf is given below: (10)

$$p(x) = \frac{2x}{k(k+1)}, x = 1, 2, \dots, k$$

Generate the random variate for  $R_1 = 0.3456$  and  $R_2 = 0.8912$ 

4. (a) Consider the following data for the M/M/1 queue simulation.  $R_0 = 10$ ,  $d = 2$ , and  $S_0^2 = 25.30$ . Estimate the long-run mean queue length,  $L_Q$ , within  $\epsilon = 2$  customers with 90% confidence. From the table, the value of  $Z_{0.05} = 1.645$ . How many additional replications are required? (10)

- (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)
5. (a) Give the equations for steady state parameters of M/G/1 queue and derive M/M/1 from M/G/1. (10)
- (b) What are the costs associated with inventory system? Describe the inventory system when - (10)
- Lead time is zero.
  - Lead time is independent of demand.
  - Lead time is dependent on demand.
6. Write short notes on (any two): (20)
- Goals and Issues in simulation of manufacturing systems.
  - Multivariate and Time-series Input Models.
  - Areas of Applications of Simulation.
  - Output analysis for terminating simulation.