Information Tech. Dept.

Bachelor Of Engineering

Question Papers Nov-Dec 2019

Sem–III to VIII

SE (IT) (Choice Based) 14/11/19

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Q 1 is compulsory.
2. Attempt any three from remaining
3. Rights indicate full marks.

1. a. If A, B, C are subset of universal set V then prove that $A \times (B \cap C)=(A\times B) \cap (A \times C)$ **05**

b. If f: R→R is given by y = 2x + 1, prove that f is one to one and onto and find f^{-1} **05**

c. Find L $\{(1 + t\bar{e}^t)^3\}$ **05**

d. Check whether the following function Harmonic or not $3x^2 + sinx + y^2 + 5y + 4$ **05**

2. a. Find k if f (z) = $\frac{1}{2}$ log $(x^2 + y^2)$ + i $\tan^{-1} \frac{kx}{y}$ is analytic **06**

b. Find L $\{|sin2t|\}$ **06**

c. Let f: R→R f(x) = x^2+2x-1
g: R→R g(x) = $4x^2$+2 **08**

Find (I) f 0 (gof) (II) go (fog)

3. a. Find Bilinear transformation under which Z=1, -i, -1 from point w =i, 0, -i **06**

b. If A be the set of non-integers and let R be a relation on A×A defined by (a, b) R(c, d) if ad=bc, then prove that R is an equivalence relation. **06**

c. Find (1) L $\left\{\int_0^t \bar{e}^u \frac{sinu}{u} du\right\}$ **08**

(2) L $\{(1 + 2t + 3t^2 + t^3)H(t - 2)\}$

4. a. Use convolution them and evaluate **06**

$L^{-1}\left\{\frac{(s+5)^2}{(s^2+10s+16)^2}\right\}$

b. Find transitive clouser of following relation defined on A= $\{a, b, c, d, e\}$ by Warshal algorithm R=$\{(a, a)\ (a, b)\ (b, c)\ (c, d)\ (c, c)(d, e)\}$ **06**

c. A man speaks truth 3 times out of 5 when a die is thrown he states that it gave an ace what is probability that this event has actually happened. **08**

5. a. How many four digit numbers can be formed out of the digits 1, 2, 3, 5, 7, 8, 9 if no digit is repeated twice? How many of them will be greater than 3000. **06**

b. Solve using Laplace transform **06**

$\frac{d^2y}{dt^2} + 9y = 18$ given that y (0) = 0 and y $(\frac{\pi}{2})$=0

c. Evaluate (1) $L^{-1}\left\{\frac{1}{\sqrt{2s+1}}\right\}$ **08**

(2) $L^{-1}\left\{\frac{2s^2-6s+5}{s^3-6s^2+115-6}\right\}$

6. a. Solve $a_n = 5a_{n-1} - 6a_{n-2}\ for\ n \geq 2, a_0 = 0, a_1 = 1$ **06**

b. Find orthogonal curves of family of curves e^{-x} Cos y +xy= α, where α is the real constant **06**

c. i. Find the image of rectangular region bounded by x=0, x=3, y=0, y=2 under the transformation w= z+(1+i) **08**

ii. A fair dice is thrown thrice. Find probability that sum of numbers obtained is 10.

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Paper / Subject Code: 51402 / Logic Design

18/11/19

SE (III) (IT) (Choice based)

Q. P. Code : 37943

(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)**

a) Why biasing is necessary in BJT amplifier?

b) Solve $(35)_{10} - (47)_{10}$ using two's compliment method.

c) Define :
   i) truth table
   ii) standard SOP
   iii) De-Morgan's theorem
   iv) Duality theorem
   v) universal gate

d) Define multiplexer and state its application.

e) Convert S-R flip-flop to T flip-flop.

2. **a)** Using Quine-Me-dusky method determine minimum SOP form for **(10)**

$$f(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$$

b) What do you mean by differential amplifier? What is its primary function? State different configurations of it, which one is popularly used. **(10)**

3. **a)** Draw & explain Ring counter using suitable waveforms. **(10)**

b) Implement the following using only one 4:1 MUX and few gates : **(10)**

$$f(A, B, C, D) = \sum m(0, 1, 3, 4, 5, 7, 9, 10, 12, 15)$$

4. **a)** Design MOD-9 Synchronous counter using J-K flip-flop. **(10)**

b) Design four bit BCD adder using IC7483. **(10)**

5. **a)** What is shift register? Mention different modes of operation of shift register? **(10)**

b) State and explain various VHDL data objects in brief. **(10)**

6. Solve the following **(Any Four)** : **(20)**

a) VHDL program format.

b) Difference between combinational circuit and sequential circuits.

c) Different biasing methods.

d) Race-around condition in flip-flop.

e) Current mirror circuit.

f) Arithmetic logic unit.

20/11/19.

B.E (IT) Sem (IT) CBCS

(3 Hours) [Total Marks: 80]

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

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

(3) Assume Suitable data if necessary.

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

1.	(a)	Explain different types of queues in data structures.	3
	(b)	How does binary search different from linear search?	3
	(c)	Explain Doubly Linked List.	3
	(d)	Define graph and list any three applications of graph.	3
	(e)	Write postfix form of the following infix expression. A+(B*(C-D)/E)	3
	(f)	Explain linear and nonlinear data structures.	2
	(g)	Write a note on recursion.	3
2.	(a)	Explain Binary search tree. Construct Binary search tree for following elements: **45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81**	10
	(b)	What is Singly Linked List? Write an algorithm to implement following operations on Singly linked List. (1)Insertion(All cases) (2)Deletion(All cases) (3)Traversal	10
3.	(a)	Write an algorithm for implementing stack using array.	10
	(b)	Write an algorithm for merge sort and comment on its complexity.	10
4.	(a)	Construct the binary tree for Inorder and Preorder traversal sequence given below Inorder: DBEAFCG Preorder: ABDECFG Write a function to traverse a tree in Postorder sequence.	10
	(b)	Write an algorithm for quick sort and comment on its complexity.	10

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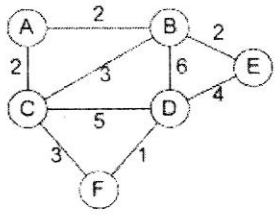
5. (a) What is collision? What are the methods to resolve collision? Explain Linear probing with an example. **10**

(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**



6. Write short notes on **(Any 4)** 20

a) Asymptotic notations
b) Double Ended Queue(De-Queue)
c) Insertion Sort
d) DFS and BFS
e) Expression Tree.

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22/11/19.

S.E/ Sem III / IT / Choice Base

(3 Hours) [Total Marks: 80]

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 generalization and specialization. **5**
   (b) Explain different keys in DBMS. **5**
   (c) Explain role of DBA. **5**
   (d) Compare traditional file system with DBMS. **5**

2. (a) List the functional dependencies which satisfy the relation: **10**

X	y	z
X1	Y1	Z1
X1	Y2	Z1
X2	Y2	Z1
X2	Y2	Z1

   (b) Suppose you are given the following requirements for a simple database of the National Cricket Trophy (NCT): **10**
   - the NCT has many teams,
   - each team has a name, a city, a coach, a captain, and a set of players,
   - each player belongs to only one team,
   - each player has a name, a position (such as left wing or goalie), a skill level,
   - and a set of injury records,
   - a team captain is also a player,
   - a game is played between two teams (referred to as host team and guest team) and has a date (such as May 11th, 1999) and a score (such as 4to 2).

   Construct ER diagram for the NCT database.

3. (a) Explain different types of operations in relational algebra. **10**
   (b) Explain Joins and types of Joins with suitable example. **10**

4. (a) Define Normalization. Explain 1NF,2NF and 3NF with suitable example. **10**
   (b) **10**
   Consider the following schema for College Library.

   Student (Roll_no, Name, Branch)

   Book (ISBN, Title, Author, Publisher)

   Issue (Roll_no, ISBN, Date_of_ Issue)

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Write SQL queries for the following statements:

i. List Roll Number and Name of all students of the branch IT.
ii. Find the name of students who have issued a book published by 'XYZ' publisher.
iii. List title of all books and their author issued by student 'Alice'
iv. List title of all books issued on or before 31st DEC, 2019

5. (a) Explain Event Condition Action (ECA) model with suitable example. **10**
   (b) Explain types of Integrity Constraints with example. **10**

6. Write note on (**any four**): **20**
   (a) DDL commands.
   (b) Hashing Techniques.
   (c) Data Independence.
   (d) Types of attributes.
   (e) Aggregate function in SQL.

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SE / I.T / choice based / Sem - III

26-11-2019

(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.

Q.1. Solve any four [20]

a). Explain need of modulation. Justify it with example.
b). Define the following terms.
i) . Noise figure ii). Noise temperature iii). Noise bandwidth
iv) Noise voltage v) Modulation.
c). Compare AM and FM.
d). Explain in short pre-emphasis and De-emphasis.
e). What is PSK signal. Draw the PSK signal for the following binary signal 111010011.
f). Explain the principle of reflection and refraction.

Q.2 a). Define signal to noise ratio. Explain the effect of cascade connection on a signal to noise ratio. Derive Friss formula for two stage cascade amplifier. [10]
b). State and prove the following properties of Fourier transform with example
i) Convolution in time domain ii) Time scaling [10]

Q.3. a) The AM Transmitter develops an unmodulated power o/p of 400 Watts across a 50Ω resistive load. The carrier is modulated by a sinusoidal signal with a modulation index of 0.8. Assuming f_m= 5KHz and f_c= 1MHz. [10]
(i) Obtain the value of carrier amplitude Vc and hence write the expression for AM signal.
(ii) Find the total sideband power.
(iii) Draw the AM wave for the given modulation index.
b). With the help of neat circuit diagram explain Indirect method of FM generation. [10]

Q.4 a). What are the limitations of TRF receiver? Explain how these limitations are avoided using super-heterodyne receiver. [10]
b). Compare ground wave, sky wave, space wave and tropospheric scatter propagation.[10]

Q.5 a). State Sampling theorem, write down the steps to prove sampling theorem, draw waveform for low pass band limited signal. [10]
b). Draw the block diagram of PWM generator and detector. Explain the working giving waveforms at the output of each block. [10]

Q6. a). Explain slope overload error and hunting error in Delta modulation. Derive the condition to avoid slope overload distortion. [10]
b) . Explain the generation and detection of FSK signal. [10]

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SE | IT | Sem-IV | Choice Based

4|12|2019

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Q.1 is compulsory
2. Attempt any three out of remaining five question
3. Rights indicate full marks.

1. a. Find greatest common divisor of the following pairs of integer, using Euclidean algorithm. **05**
(3083, 2893)

b. Given two lines regression **05**

$$6y = 5x + 90, 15x = 8y + 130, \ \sigma_x^2 = 16$$

Find (i) $\bar{x}$ and $\bar{y}$ (ii) Find r

c. Prove that A={1, 2, 3, 4, 5, 6 } is a finite abelian group under multiplication modulo 7 **05**

d. A random variable x has the following probability function **05**

x:	1	2	3	4	5	6	7
p(x)	K	2 K	3K	K^2	K^2+k	$2K^2$	$4K^2$

Find (I) k (II) p (x<5)

2. a. Calculate coefficient of correlation between x and y **06**

x:	3	6	4	5	7
y:	2	4	5	3	6

b. A random sample of size 16 from a normal population. Showed a mean of 103.75 cm and sum of squares of deviation from the mean 843.75 cm^2 can we say that the population has mean of 108.75 cm? **06**

c. Prove that G= $\{1, -1, i, -i\}$ is a group under usual multiplication of complex numbers. **08**

3. a. Draw Hasse diagram for $(D_{75}, \leq)$, check whether it is a lattice **06**

b. Out of 1000 families of 3 children each how many would you expect to have 2 boys and 1 girl? **06**

c. i. Find last digit of base 7 expansion of 3^{100} i.e. 3^{100} (mod 7) by using Fermat's theorem **08**

ii. Find the Legendre's symbol $\left(\frac{19}{23}\right)$

4. a. Can a complete graph with 8 vertices have 40 edges excluding self-loop **06**

b. Find remainder when 2^{50} and 41^{65} are divisible by 7 **06**

c. Investigate the association between darkness of eye colour in father and son from the following data **06**

father's eye

Son's eye		Dark	Not Dark	Total
	Dark	48	90	138
	Not dark	80	782	862
		128	872	1000

5. a. Let L={1, 2, 3, 4, 12} and the relation be "is divisible by" write compliments of L **06**

b. If x is a Poisson variate and p (x=0) = 6 p (x=3) Find P (x=2) **06**

c. Define the following terms giving illustration **08**

1.	Simple graph	2.	Complete graph
3.	Bipartite graph	4.	Planar graph

6. a. Solve $x \equiv 1 \pmod 5$
$x \equiv 2 \pmod 6$
$x \equiv 3 \pmod 7$ **06**

b. A certain injection administered to 12 patients resulted in following changes of blood pressure (5, 2, 8, -1, 3, 0, 6, -2, 1, 5, 0, 4) can it be concluded that injection will be in general accompanied by an increase in blood pressure? **06**

c. i. Write the following permutation as product of disjoint cycles **08**
f = (1 3 2 5) (1 4 5) (2 5 1)

ii. simplifies sum of product
$(A+B)\,(A+B^1)\,(A^1+B)\,(A^1+B^1)$

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$10 + 10 = 20$

9|12|2019

SE| IT| Sem-IV| Choice based

(3 Hours) [Total Marks: 80]

N.B.: (1) Question No.1 is compulsory.
(2) Attempt any three questions from the remaining five questions.
(3) Make suitable assumptions wherever necessary but justify your assumptions

1. a) Compare Ring and Star topology 5
   b) Use RLE method of compression to compress the following data:
      Data: AAAACCBBBDDDDDEFF 5
   c) Explain the TCP connection establishment with relevant diagram 5
   d) Compare LAN MAN and WAN 5

2. a) What is the OSI Model? Give functions and services of each layer. 10
   b) Discuss the different networking devices used for internetworking. 10

3. a) What is Domain Name system? How does it work? Explain the resolution process 10
   b) Explain the different transmission media in networking. 10

4. a) What is congestion and what are its causes? Explain Token bucket algorithm for congestion control 10
   b) Explain the TCP header format 10

5. a) Compare Static and Dynamic Routing and explain any one with an example. 10
   b) Explain stop and wait protocol. What are its drawbacks? How can they be overcome? 10

6. Write a note on **(any two)** 20
   a. RPC
   b. CSMA/CD
   c. IP Addressing

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SE IT SEM IV CHOICE BASED 11/12/2019

(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.

Q1. Define Operating System and also explain objectives and functions of O.S. **10**

a.

b. Consider the following set of processes, with the arrival times and the CPU burst times given in milliseconds. **10**

Process	Burst Time	Arrival Time
PI	15	0
P2	5	0
P3	13	0

Draw Gantt chart, calculate Turnaround Time, Waiting Time, Average Turnaround Time and Average Waiting Time for:
i) First-Come First-Served.
ii) Shortest Job First.

Q2. What are the four conditions that create deadlock? Explain deadlock **10**
A Prevention and avoidance techniques.
B What is Scheduling? Also explain Short Term, Mid Term and Long Term **10**
Scheduling.

Q3 Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 **10**
A KB(in order), how would each off the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order) ? Which algorithm makes the most efficient use of memory?
B Explain demand paging with suitable example. **10**

Q4 What is RAID? What are the different RAID levels? **10**
A
B Compare State full Server v/s Stateless Server with a proper example. **10**

Q5 Why there is need for communication between two processes? Explain **10**
A various modes of communication.
b Explain the page replacement policies implement LRU, OPT, FIFO for the **10**
following Sequence : 0, 1, 2, 4, 3, 7, 1, 4, 2, 3.
Also calculate hits and faults.

Q6 What are preemptive and non-preemptive algorithms? Explain any two with **10**
A the help of example.
B Write short notes on Network O.S vs. Distributed O.S. **10**

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71831

S.E. (IT) Sem-IV Choice Base 13/12/2019

(3 Hours) [Total Marks: 80]

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) Draw and explain memory hierarchy.

b) Differentiate between MIN and MAX mode of 8086 Microprocessor.

c) Discuss the importance of Nano Programming.

d) Express $(15.125)_{10}$ in IEE 754 single precision floating point representation.

e) Explain following instructions of 8086 microprocessor – OR, DAA, INC, JNZ, POP

Q. 2 a) Draw and explain internal architecture of 8086 microprocessor. . [10]

b) Draw the flowchart of Booths algorithm and perform -7 X 3. [10]

Q. 3 a) Perform 18 divided by 5 using Restoring division algorithm. [10]

b) What is the need of DMA in computer system? Explain in detail its operation in various modes.. [10]

Q. 4 a) Discuss various memory characteristics in detail. [10]

b) Compare Hardwired and Microprogrammed Control Unit. [10]

Q. 5 a) Explain Direct Cache Memory mapping in detail with example. [10]

b) Write assembly language program for 8086 microprocessor to find whether a 8 bit number stored at 1000H is even or odd number. Store the 00H or 01H at 1001H if the number is even or odd respectively. [10]

Q. 6 a) Explain with example addressing modes of 8086 microprocessor [10]

b) Draw and explain the various pipeline hazards. [10]

17/12/2019

Paper / Subject Code: 41005 / Automata Theory

S.E (IT) sem-IV Choice based Dec-2019

(3 Hours) **Marks:80**

Note: Question **No. 1** is **Compulsory**
Attempt **any three** out of the remaining **five** questions
Assumptions made should be clearly stated

Q.1 Attempt any four sub-questions.

a) Construct the Finite Automata for binary umber divisible by 2 **(05)**

b) Design FA for decimal number divisible by 5 **(05)**

c) Give formal definition of Turing Machine **(05)**

d) State and explain closure properties of regular languages **(05)**

e) Construct DFA accepting all the strings corresponding to the Regular expression
1* 0 1 (0 + 11) * **(05)**

Q2. a) Construct the following grammar to CNF **(10)**

S→ Ba / aB
A→bAA / aS / a
B→aBB / bS / b

b) Design Moore machine for binary adder. **(10)**

Q3.a) Design a DFA corresponding to the regular expression (a+b)* aba (a+b)* **(10)**

b) Define CFG, obtain CGF for the following grammar **(10)**
(110+11)* (10)*

Q4.a) Design a PDA for CFL that checks the well formedness of parenthesis i.e. the language L of all balanced string of two types of parenthesis "( )" and "[ ]".Trace the sequence of moves made corresponding to input string [( ) (( ))]. **(10)**

b) Construct a TM for 2's complement of a binary number. Simulate it for 1 0 1 0 **(10)**

Q5. a) Let G be the grammar. Find the leftmost derivation, rightmost derivation and parse tree for the string 001222. **(10)**

G: S → 0S | 1A | 2B | ε
A → 1A | 2B | ε
B → 2B | ε

b) Consider the CFG S→aSb | bSa | SS | ε , consider the string ***babbabaaaababb*** .prove that given grammar is ambiguous by generating more than one parse tree for a given string **(10)**

Q6. Write short notes on **(20)**

a) Applications of Automata Theory
b) Chomsky Hierarchy
c) Power and limitations of PDA
d) Halting Problem.

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15/11/19

TE / IT / SEM V / CBCS

Time: 3 Hours **Total Marks: 80**

N.B.: 1. Question No. 1 compulsory.
2. Attempt any Three out of remaining five questions.
3. Figures to the right indicate full marks.
4. Draw neat diagram wherever necessary.

Q1. Solve any four out of five

A)	Differentiate between Microprocessor and Microcontrollers	05
B)	Give salient features of ARM7 processor	05
C)	Explain in brief various characteristics of RTOS	05
D)	What are the design metrics of an embedded systems	05
E)	List an important features of Raspberry_pi board.	05

Q2. A) Explain SJMP,AJMP and LJMP instructions of 8051 in detail 10

B) Explain CPSR of ARM7 in detail 10

Q3. A) Write a program to transfer "INDIA" serially at 9600 baud rate with using 8051.Assume frequency 11.0592Mhz. 10

B) Explain in brief the architecture of RTOS 10

Q4. A) List and explain how exceptions and interrupts handled in ARM7. 10

B) Write a program to generate a triangular waveform using DAC and 8051. Draw the interfacing circuit diagram 10

Q5. A) Explain Internal memory organization of 8051 10

B) Draw interfacing of keyboard matrix with 8051 in detail with diagram. Write a program to generate Hexadecimal values. 10

Q6. Write notes on: (ANY TWO) 20

a) Hard real time and Soft real time RTOS
b) Modes of timers in 8051
c) Interrupts of 8051
d) Extended libraries of Arduino

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$40 + 37 + 10 = 87$

TE (IV) (IT) (CBCS) 19/11/19

(3 Hours) [Total Marks: 80]

N.B.: (1) Question No.1 is compulsory.
(2) Attempt three questions out of remaining.
(3) Figures to right indicate full marks.

Q.1 Answer the following

a. Explain <Canvas> element in HTML5. [05]
b. Explain UDDI. [05]
c. Create an HTML page which will divide a page in two horizontal fragments using frameset tag, each frame should have different background color & different headings. [05]
d. Differentiate between XML & HTML. [05]

Q.2

a. Explain Geo-location and media query with an example in HTML5 and CSS3. [10]
b. What is cross browser compatibility? Explain the issues related to cross browser compatibility. [10]

Q.3

a. Explain features of Django Framework. [10]
b. Write an HTML code to process placement registration form which accepts the student details like name, address, email-id, contact-number, date of birth, percentage, branch (must be selected using radio button) and technology-preferred (using checkbox). Write the JavaScript code to validate the following

i. valid email id ("@" and ".")
ii. all the fields must be filled before submission of the form.
iii. percentage validation is minimum first class (= > 60 %) [10]

Q.4

a. Draw the diagram of AJAX application model and traditional application web model and compare them. [10]

b. Create an HTML form to accept the details like Name (Text field), Address (Textarea), Gender (Radio) and Company Name (Dropdown box) fields from user, Write a PHP code to store this information into employee table using MySQL database . [10]

Q.5

a. Explain architecture of JSON mash-ups in detail with neat diagram. [10]
b. Explain XML & DTD with example. [10]

Q.6

a. Write a HTML5 code for embedding audio & video elements in web page. [10]
b. Differentiate between REST & SOAP. [05]
c. Explain characteristics of Rich Internet application (RIA). [05]

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21/11/19

T.E.(IT) / SEM V / Choice Base

Time: 3 hours **Marks: 80**

N.B.: 1. Question no. 1 is compulsory.
2. Attempt any Three from remaining questions.
3. Give examples wherever required.

Q 1	a	List out the twelve rules for distributed DB.	5
	b	Explain Shared Memory and Shared Nothing Architecture for Parallel DBs.	5
	c	Why BCNF is called as stricter than 3NF? Justify your answer.	5
	d	What is Materialized View, What is its utility?	5
Q 2	a	Explain Discretionary Access Control, Mandatory Access Control and Role- Based Access Control in brief.	10
	b	Explain Significance of each step in ETL Process, also explain types of data extraction and data transformation.	10
Q 3	a	Explain Sort-Merge Join and HASH Join.	10
	b	Explain Wait- Die and Wound-Wait methods for Deadlock Prevention. Compare them in terms of no. of Possible rollbacks and Starvation.	10
Q 4	a	Explain Star and Snow Flake Schema. Specify their Pros and Cons.	10
	b	Explain Aries Algorithm in detail.	10
Q 5	a	Consider a data warehouse for weather related data like region, date and temperature. Using this example explain all the OLAP operations	10
	b	Explain Primary Horizontal, Derived Horizontal and Vertical Fragmentation with example. Comment on Completeness, Reconstruction and Disjointness Properties.	10
Q 6		Short Note on:	
	a	Temporal databases	5
	b	Spatial Databases	5
	c	Inconsistent read, fuzzy read and phantom read problems in concurrent schedules.	5
	d	Data Marts	5

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25/11/19

T.E / IT / SEM V / Choice Base

Duration : 3 Hours **Total Marks: 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) Write short note on eavesdropping.	(05)
	(b) Write short note on Stenography.	(05)
	(c) Write a short note on Blowfish.	(05)
	(d) List S/MIME services.	(05)
Q.2	(a) Explain Transposition Ciphers with illustrative Example.	(10)
	(b) Compare and contrast DES and AES.	(10)
Q.3	(a) Perform encryption and decryption using RSA algorithm with p=7,q=11,e=17 and M=8.	(10)
	(b) Describe the Block Cipher Modes in detail.	(10)
Q.4	(a) Explain Kerberos Protocol in detail.	(10)
	(b) What Is PKI. Explain different PKI architectures in detail.	(10)
Q. 5	(a) Explain Diffie Hellman Key Exchange with suitable Example.	(10)
	(b) Explain Needham-Schroeder protocol for secret key distribution with suitable diagram.	(10)
Q. 6	Write short notes on **(Any Four)** i) HMAC vs CMAC ii) ARP Spoofing iii) Port Scanning iv) Honeypot v) El-Gamal Algorithm vi) Session Hijacking	(20)

27-11-2019

T.E. / I.T. / choice based / sem - V

(3 Hours) Total Marks: 80

Note : Question No 1 is compulsory

Attempt any 3 questions from remaining.

Assume suitable data whenever necessary

Q1. Develop a complete business plan for startup to sell Garments online.
It should include:
The business model, strategic plan, marketing plan, SCM and CRM plan, Revenue model(s), security concerns and payment mode. [20]

Q2 A) What are generic strategies? Give examples of the generic strategies adopted by e- retailer. [10]

B) Explain the SET protocol for credit card payments [10]

Q3 A) Discuss CRM strategy based on B-C Model [10]

B) Explain Market Segmentation with types. How E-commerce companies use Customers behavior for market segmentation? [10]

Q4 A) Explain the categories of Online Auction web sites , also brief the various auction related services. [10]

B) Write short note on value chain approach for marketing. [10]

Q5.A) Discuss the impact of consolidation on competition in e-commerce sector? [10]

B) Whether inventory led model or the traditional marketplace model is a good option in case of e-grocery business give your opinion with arguments in support of your contention [10]

Q6 A) Write notes on Application of RFID tag in SCM [10]

B) Explain different session management techniques in e-commerce. [10]

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TE | I.T. | Sem – VI | Choice Base 3/12/2019

[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 3 from remaining questions.
3. Assume suitable data if required.

1. a. Discuss functional and Non-Functional requirements. 5
   b. Explain the relationship among scope, schedule and budget? 5
   c. What is Project? What are the attributes of a project? 5
   d. Compare PERT and CPM 5

2. (a) Explain how Gantt-chart can be used for planning and controlling small projects with suitable example? What are the limitations of Gantt-Chart? 10
   (b) What are the advantages of including milestones in the WBS? Why should the WBS be deliverable oriented? 10

3. (a) What is Agile methodology? Explain SCRUM. 10
   (b) Explain the different types of testing? 10

4. (a) What do you mean by Project Charter and Plan? Are they different? 10
   (b) Suppose you are the project manager of a large software development project. Mention at least three reasons for your project delay. What are the risks associated with project delay? Perform Risk assessment and prepare RMMM plan for the same. 10

5. (a) What is Function Point Analysis, explain in detail? What are its benefits in engineering process? 10
   (b) What are the PMBOK Areas? 10

6. (a) Explain Mc Call's Quality factors? 10
   (b) Explain in detail 4P's of project management. 10

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TE | I.T. | Sem-VI | Choice Based

5/12/2019

(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) Describe different types of attributes with example. **[05]**

(b) Explain KDD process with diagram. **[05]**

(c) Define and explain: **i)** Support **ii)** Confidence **iii)** Information Gain **iv)** Entropy **v)** Gini index **[05]**

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

Q.2.(a) Explain DBSCAN clustering algorithm with an example **[10]**

(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: <Homeowner: No, Marital Status: Married, Job experience:3> **[10]**

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) What are multiple level and multidimensional association rules? Explain with suitable examples for each. [10]

Q5. (a) Explain Business Intelligence issues [10]

(b) Explain Market-Basket analysis with example. [10]

Q6. (a) What is data visualization? Explain any 3 visualization techniques with example. [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.

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TE IT SEM VI CHOICE BASED 10/12/2019

(Time: 3 Hours) [Total marks: 80]

N.B.

1) Question No. 1 is Compulsory. Attempt any 3 From remaining 5 Questions.
2) Figure to right indicate full marks.
3) Assume suitable data if necessary

Q.1 a) Explain Kernel based virtualization with the help of its architecture. [10]

b) What is Instance? Draw and explain life cycle of Instances. [10]

Q. 2 a) Explain Disaster recovery as a service. [10]

b) Draw and Explain Openstack architecture. [10]

Q.3 a) List & explain the advantage and disadvantages of cloud computing. [10]

b) Explain Bigtable in GFS. [10]

Q. 4 a) Explain Xen Virtualization with the help of its architecture. [10]

b) Explain subnet, route table and Elastic IP address with Example? [10]

Q.5 a) Draw and explain NIST & Cube model of cloud computing. [10]

b) Explain Simple Storage as Service and its feature. [10]

Q. 6 Solve **Any Four** [20]

a) Google APIs.

b) Explain Bucket in S3

c) CDMI

d) Analytics as a service

e) Type of hypervisors

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T.E. (IT) Sem-VI Choice Base 12/12/2019

(3 Hours) (Total Marks : 80)

N.B. : (1) Question No. 1 is **compulsory.**
(2) Attempt any **three** from remaining **five** questions.
(3) Assume suitable **data**, if **necessary**.

Q.1 a. Explain in detail hidden terminal and exposed terminal problem with respect to WLAN. **[05]**

b. What is frequency reuse principle with neat diagram? Explain it with example. **[05]**

c. Assume a cellular system of 32 cells with cell radius of 1.6km, a total spectrum allocation that supports 336 traffic channels and a reuse pattern of 7. Calculate the total service area covered with this configuration, the number of channels per cell and total system capacity. Assume regular hexagonal topology. **[05]**

d. Explain piconet and scatternet w.r.t Bluetooth. **[05]**

Q.2 a. Explain WEP protocol in detail with neat diagram. **[10]**

b. What is spread spectrum? Explain FHSS in detail. **[10]**

Q.3 a. What is WLL? Explain in detail MMDS and LMDS working in WLL based technology **[10]**

b. Explain GPRS architecture in detail with neat diagram. **[10]**

Q.4 a. What is Ad-hoc network? Discuss and compare MANET and VANET architecture. **[10]**

b. Explain wireless multiple access techniques with suitable diagrams. **[10]**

Q.5 a. Explain the evolution of cellular systems highlighting 1G/2G/3G. **[10]**

b. Define threats and challenges in wireless communication. Explain different types of device security issues **[10]**

Q.6 Write a short note on the following (solve any **four**) : **[20]**

a. Wi-Max
b. Zigbee architecture
c. Mobile IP
d. UMTS architecture
e. Wireless sensor networks architecure

Paper / Subject Code: 88987 / Elective - II Digital Forensics

TE IT Sem-VI choice based 16/12/19

(3 Hours) Marks : 80

Note: 1) Question number 1 is compulsory.
2) Attempt any THREE from remaining questions.

Q.1	a.	What is Evidence? Explain the various types of digital evidence.	5
	b.	How are ethical hackers different than malicious hackers?	5
	c.	Explain importance of forensic duplication and its method. Also list some duplication tools.	5
	d.	List and explain the various types of cybercrime	5
Q.2	a.	List and Explain the different types of Evidence in digital forensics.	10
	b.	What is an Intrusion Detection System? Explain different types of Intrusion Detection system.	10
Q.3	a.	Explain volatile data collection procedure for windows system.	10
	b.	What is Incident Response? Explain Incident Response Methodology in detail.	10
Q.4	a.	What are the steps involved in computer evidence handling? Explain in detail.	10
	b.	Explain RAID technique in detail	10
Q.5	a.	Explain guidelines for incident report writing. Give one report writing example.	10
	b.	List various Digital forensic tools and explain any one tool with case study.	10
Q.6	a.	Explain procedure to investigating routers	5
	b.	Explain the attacks on Network and its prevention.	5
	c.	What is Cyber-crime? What are the different roles of computer with respect to cybercrime	5
	d.	Explain importance of Hashing in Forensics analysis.	5

BE(IT)(VII) (Choice Based) 14/11/2019

(3 Hours) **[Total Marks: 80]**

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

(2) Attempt any three questions from the remaining five questions.

(3) Make suitable assumptions wherever necessary but justify your assumptions

1. a) Explain SONA framework for flexible network design. **10**
   b) Compare the Top-Down vs Bottom-Up Network Design Approach **10**

2. a) State and Explain in brief different external threats hampering the integrity of the enterprise network. **10**
   b) Explain different phases in PPDIOO Network Lifecycle. **10**

3. a) Explain the role SNMP in network management. **10**
   b) Explain the hierarchical network model of network design. **10**

4. a) Explain VPN and its implementation techniques. **10**
   b) Explain EIGRP in detail and highlight its characteristics which make it suitable for Enterprise Networks. **10**

5. a) State and Explain IPv4 to IPv6 Transition strategies. **10**
   b) State and explain suitable routing protocols for Enterprise architecture. **10**

6. Write a note on **(any two)** **20**
   a. SDN Architecture
   b. MPLS
   c. Enterprise WAN architecture technologies

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BE (VII) (IT) (Choice based) 18/11/19

(3 Hours) [Total Marks: 80]

N.B.: 1) Question number 1 is compulsory.
2) Attempt any three questions form remaining questions.
3) Figures to the right indicate full marks.

1.Answer any four

a) Write short notes on Access Control Policies (05)
b) Write short notes on Buffer overflow (05)
c) Explain WLAN Security attacks (05)
d) Write Cross Site Request Forgery with example (05)
e) Explain Business Continuity Plan (05)

2. a) Explain the different types of Malware in Software Security (10)
b) Explain the different types of authentication methods (10)

3. a) Explain UTMS Security with neat diagram (10)
b) Explain OAuth 2.0 architecture and its grant type with neat diagram (10)

4. a) Explain the different types WLAN Security attacks (10)
b) Explain OWASP and its ten vulnerabilities (10)

5. a) Explain different types of Email Attacks (10)
b) Explain File protection System in software security (10)

6. Write short notes on (Any four)

a) Explain the incidental management (05)
b) Secure Socket Layer (05)
c) Multilevel Database Security (05)
d) Data protection in cloud (05)
e) Cloud Identity and Access Management (05)

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20/11/19

BE (I.T.) Sem-VII Choice based

[Time: 03 Hours] [Marks: 80]

Note: 1. Question number **1** is **compulsory**.
2. Solve any **three** questions out of the remaining **five** questions
3. Assume suitable data if necessary
4. Figure to right indicate full marks

Q.1 Solve any **Four** of the following.

(a) Explain different definitions of artificial intelligence according to different categories. **05**

(b) Solve the given problem using Crypt Arithmetic method. **05**

```
    S  E  N  D
+   M  O  R  E
-------------------
M O  N  E  Y
```

(c) Represent each of the following sentences in first-order logic. **05**

i) A whale is a mammal.
ii) Jane likes John.
iii) If it's raining, then the ground is wet.
iv) If the switch is on and the light is off then the light-bulb is broken.
v) All computers have a processor.

(d) Differentiate between STRIPS language and ADL. **05**

(e) Explain main components of a Cognitive Computing system. **05**

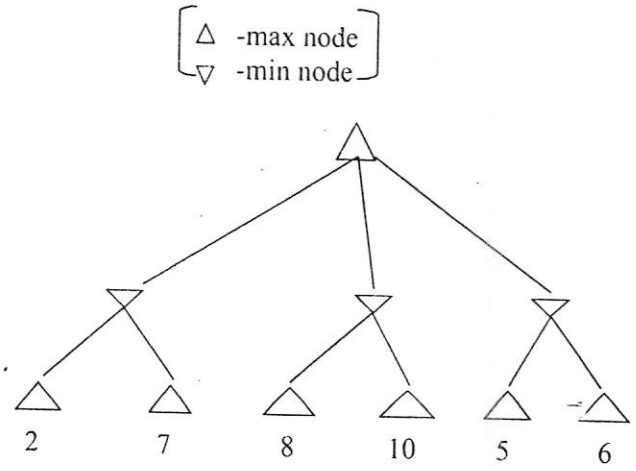
Q.2 **(a)** Explain Model based Reflex agent and Utility based agent with block diagram. **10**

(b) Explain different knowledge representation methods with example. **10**

Q.3 **(a)** Differentiate between Informed and Uninformed search techniques. Also explain A*algorithm with suitable example. **10**

(b) Explain Planning in AI. Compare Partial Order Planning with Conditional Planning. Also, explain the real time application of hierarchical planning. **10**

Q.4 **(a)** Apply Mini-max and Alpha-Beta Pruning on given game tree and find which is the next move. **10**



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Q.4 (b) Consider two medical tests, A and B, for a virus. Test A is 95% effective at recognizing the virus when it is present, but has a 10% false positive rate (indicating that the virus is present, when it is not). Test B is 90% effective at recognizing the virus, but has a 5% false positive rate. The two tests use independent methods of identifying the virus. The virus is carried by 1% of all people. Say that a person is tested for the virus using only one of the tests, and that test comes back positive for carrying the virus. Which test returning positive is more indicative of someone really carrying the virus? Justify your answer mathematically. **10**

Q.5 (a) Explain Forward-chaining and Backward-Chaining algorithm with the help of example. **10**

(b) Explain different components of Natural Language processing? Also, explain different levels of knowledge used in language understanding? **10**

Q.6 Write a short note on any **Four**.

(a) Bayesian Network with example **05**

(b) Supervised and Unsupervised learning **05**

(c) Role of NLP in Cognitive System **05**

(d) Conditional Probability and Its role in AI **05**

(e) Knowledge based agent **05**

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22/11/19

B.E/SEM VII/IT/Choice Base

(3 Hours) [Total Marks: 80]

N.B.: (1) Question **No.1** is **Compulsory**.
(2) Attempt **any three** from **remaining five** questions.
(3) **Assume** suitable data, **if necessary**.

1. (a) Discuss the Android Architecture with all layers. Also discuss the role of DVM in detail. **(10)**
   (b) Explain Various Android features. Why android is popular mobile operating system discuss with reasons. **(10)**

2. (a) Implement the Android Mobile App to accept UserID and Password from user (Use TextView and EditText). App should contain three Buttons, namely, Submit, Reset and Exit. On Submit button click, the UserId and Password should be authenticated (Assume any UserId and Password, hardcoded in Java Activity), On Reset click the UserId and Password fields should get empty and on Exit Button click, App should be terminated. **(10)**
   (Discuss steps and Java code in detail, also explain how UI can be created using XML code).
   (b) What is the role of Activity in Android? Discuss the life cycle of Activity in Android. **(10)**

3. (a) What is Intent in Android? Differentiate between explicit and implicit intent. **(10)**
   (b) Discuss the various Layout in Android. Demonstrate any Layout with suitable example. **(10)**

4. (a) Discuss how data persistency can be achieved in Android. What is Content Provider in Android? Explain Content Provider in detail. **(10)**
   (b) Discuss how SQLite is different than other database approach in Android. Write a code in SQLite to fetch data from any table and display on screen using Cursor. (Assume table is already created with sample records in it). **(10)**

5. (a) Explain the Camera API in Android with suitable examples. **(10)**
   (b) Discuss what type of App we can build using Location API in Android. Also explain how to get the current location of User in Android Apps. **(10)**

6. Write short note on (**any four**):
   (a) Role of Android.Manifest.xml file in Android **(5)**
   (b) Android App publishing **(5)**
   (c) Android Download Manager **(5)**
   (d) Android Security Issues **(5)**
   (e) XML and JSON Parsing in Android **(5)**

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B.E / I.T. / choice based / Sem - VII

26-11-2019

(3 Hours) (Total Marks : 80)

N.B: 1) **Q.1** is **compulsory.**
2) Attempt **any THREE** questions from the remaining questions.
3) Assume suitable **data** if **necessary.**

Q.1 Attempt **any four** :

a) Compare active attacks vs Passive attacks. [5]

b) Explain various types of key-loggers in brief. [5]

c) Classify the cybercrimes and explain any one briefly. [5]

d) Explain how the appeals can be made under The IT ACT 2000. [5]

e) Write brief note on : Cyber-terrorism. [5]

Q.2 a) How criminals plan the attack? Discuss various steps involved [10]

b) Explain how Intellectual property laws protect the rights of the owner of the intellectual Property. [10]

Q.3 a) Compare Vishing, Phishing and Smishing in cyber security. [10]

b) What is E-commerce? Explain different types of e-commerce with suitable examples. [10]

Q.4 a) What is Bluetooth hacking? Explain Bluetooth hacking tools in brief. [10]

b) How the Indian penal code IPC 1860 addresses cybercrime? [10]

Q.5 a) Discuss basic security precautions to be taken to safeguard Laptops and wireless devices. [10]

b) What is E-contract? Discuss E-contract Act 1872. [10]

Q.6 Write short note on **(Any 2)** : [20]

1) Computer Sabotage.
2) Indian Information Technology Act 2000
3) Write key IT requirements for SOX and HIPAA.

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