(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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SEM VII / INFT / Choice

Paper / Subject Code: 42652 / Infrastructure Security / NOV 2019

(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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INFT/SEM VII/ Paper / Subject Code: 42653 / Artificial Intelligence / NOV 2019

Choice/

[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**

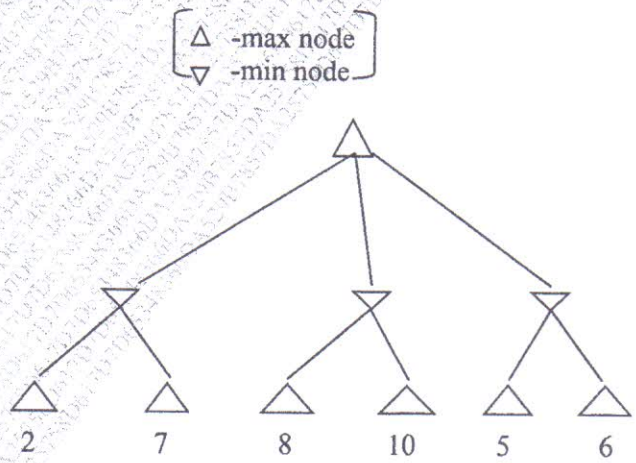
Q.2 **(a)** Explain Model based Reflex agent and Utility based agent with block diagram. **10**

(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**



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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[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B:
1. Question no. 1 is compulsory.
2. Solve any three out of remaining.
3. Draw figure wherever necessary.
4. Assume suitable data wherever required.

Q.1 a) Consider disk 1/0 system in which an 1/0 request arrives at a rate of 100 I/O per second. The disk service time is Rs. = 8ms. Calculate the measure of disk performance. **(10)**

i) Utilization of I/O controller (U)
ii) Total Response Time (R)
iii) Average Queue Size
iv) Total time spent by a request in the queue

Consider the same disk I/O system and calculate the above measure of disk performance if the disk service time is halved i.e. Rs. 4ms.

b) Show comparison of different RAID levels. **(10)**

Q.2 a) Explain components of Intelligence Storage System (ISS) in detail. **(10)**

b) Draw and explain BC planning life cycle in detail with example, define RTO and RPO. **(10)**

Q.3 a) Explain storage security domain and its implementation in storage technology. **(10)**

b) Explain NAS workload and mention characteristics of NAS. **(10)**

Q.4 a) Explain availability plan and services in storage network. **(10)**

b) Explain ILC for any applications of your choice. **(10)**

Q.5 a) Explain SAN configuration in detail. **(10)**

b) Explain Data Centre Infrastructure in detail with elements and functionality. **(10)**

Q.6 a) Explain NAS components and protocol in detail. **(10)**

b) Explain SAN Host Bus Adapter. **(10)**

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(3 Hours) [Total Marks : 80]

Note : Question No. 1 is compulsory.
Attempt Any Three from remaining questions.
Assume suitable data if required.

Q1

A. Explain the need of automation in testing ? Differentiate between manual testing and Automated Testing 10

B. What are Key elements of Test Management ? Explain the structure of testing group. 10

Q2 A. Classify different types of bugs based on Software development lifecycle 10

B. A program reads three numbers, *A*, *B*, and *C*, with a range [1, 50] and prints the largest number. Design test cases for this program using equivalence class testing technique. 10

Q3 A. Discuss verification and validation activities. 10

B. What is Mutation Testing ? Explain Mutation Testing Process 10

Q4 A . Consider the program for calculating the factorial of a number. 10

(a) Draw the DD graph for the program.

(b) Calculate the individual cyclomatic complexity number for main() and fact() and then,

the cyclomatic complexity for the whole program.

```
main()
{
int number;
int fact();
1. clrscr();
2. printf("Enter the number whose factorial is to be found out");
3. scanf("%d", &number);
4. if(number <0)
5. printf("Facorial cannot be defi ned for this number);
6. else
7. printf("Factorial is %d", fact(number));
8. }
int fact(int number)
{
int index;
1. int product =1;
2. for(index=1; index<=number; index++)
3. product = product * index;
4. return(product);
5. }
```

B. What is Test Plan ? Explain Different components of Test plan document. 10

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Q5 A. Explain challenges in Agile Testing **10**

B. Comment on regression testing process. **10**

Q6.

Write Short Note on following **20**

A. Test point analysis

B. Unit testing and Integration testing

C. Bug Lifecycle

D. McCall's Quality Factors and Criteria

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3 Hours **Total: 80 marks**

N.B: (1) Question no 1 is compulsory
(2) Attempt any **three** out of remaining **five** questions
(3) Figures to the right indicate full marks
(4) Assume Suitable data if necessary
(5) Notations carry usual meaning

Q.1 Answer **any four** of the following questions:

a)Write the dual of the following LPP
Maximise Z= $4x_1 + 2x_2$
Subject to ,
$x_1 - 2x_2 \geq 2$
$x_1 + 2x_2 = 8$
$x_1 - x_2 \leq 10$
Where $x_1 \geq 0, x_2$ is unrestricted in sign. **(05)**
b)What are assumptions made in game theory **(05)**
c) Write short note on special cases in Linear Programming Problem. **(05)**
d) Enlist assumptions in sequencing problem. **(05)**
e) Briefly explain Monte Carlo simulation with suitable example. **(05)**

Q.2 a) Solve by Simplex Method:

Maximize $Z=3x_1 + 2x_2$
Subject to
$x_1 + x_2 \leq 4$,
$x_1 - x_2 \leq 2$
Where $x_1, x_2 \geq 0$ **(10)**

b) Workers come to tool store room to receive special tools (required by them) for accomplishing a particular project assigned to them. The average time between two arrivals is 60 seconds and the arrivals are assumed to be in Poisson distribution. The average service time (of tool room attendant) is 40 seconds. Determine

1) Average queue length
2) Average length of non empty queue
3) Average number of workers in system
4) Mean waiting time of an arrival
5) Average waiting time of an arrival (worker) who waits. **(10)**

Q.3 a) Solve the following by Vogel's Approximation Method (VAM) and find optimal transportation plan. **(10)**

	D_1	D_2	D_3	D_4	Supply
S_1	19	30	50	10	7
S_2	70	30	40	60	9
S_3	40	8	70	20	18
Demand	5	8	7	14	

b) Iyengar Bakery keeps stock of a popular brand of cake. Previous experience indicates the daily demand as given here: **(10)**

Daily Demand	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Consider the following sequence of random numbers:
48,78,19,51,56,77,15,14,68,09

Using this sequence simulate the demand for the next 10 days. Find out the stock situation if the owner of the bakery decided to make 30 cakes every day. Also estimate the daily average demand for this cake on the basis of simulated data.

Q.4 a) Solve the following Assignment Problem. **(10)**

Contractors	**Cost of Repairs (Rs.in Lakhs) of Roads**			
	R_1	**R_2**	**R_3**	**R_4**
C_1	9	14	19	15
C_2	9	17	20	19
C_3	9	18	21	18
C_4	10	12	18	19
C_5	10	15	21	16

Rs.50 Lakhs is total cost of repair.

1) Find the best way of assigning the repair work to the contractors and cost.
2) If it is necessary to seek supplementary grants, then what should be the amount?
3) Which of the 5 contractors will be unsuccessful in his bid?

b) A distance network consists of eleven nodes which are distributed as shown in following table. Find the shortest path from node 1 to node 11 using dynamic programming. The corresponding distance are: **(10)**

Arc	**Distance**	**Arc**	**Distance**
1-2	8	5-8	12
1-3	7	5-9	7
1-4	1	6-9	9
2-5	5	7-9	6
3-5	9	7-10	13
3-6	2	8-11	4
3-7	8	9-11	2
4-7	10	10-11	15

Q.5 a) A and B play a game in which each has three coins a 5p,a 10p and 20p.Each player selects a coin without the knowledge of the others choice. If the sum of the coin is an odd amount, A wins B's coin; if the sum is even, B wins A's coin. Find the best strategy for each player and the value of the game. **(10)**

b)Solve by **Big-M or Charne's Penalty Method** **(10)**

Maximize $Z=4x_1 + x_2$

Subject to $3x_1 + x_2 = 3$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \leq 4$

Where $x_1, x_2 \geq 0$

Q.6 a) A book binder has one printing press, one binding machine and the manuscript of number of different books. The time required to perform the printing and binding operation for each book are given below. Determine the order in which book should be processed, in order to minimise the total time required to turn out all the books. Also find the idle time of binding machine. **(10)**

Books	**1**	**2**	**3**	**4**	**5**	**6**
Printing time (hr)	30	120	50	20	90	110
Binding time (hr)	80	100	90	60	30	10

b) Mini Computer Company purchases a component of which it has a steady usage of 1000 units per year. The ordering cost is Rs.50 per order. The estimated cost of money invested is 25% per year. The unit cost of the component is Rs.40.Calculate the optimal ordering policy and total cost of inventory system, including purchase cost of the components. If the component supplier agrees to offer price discounts of minimum lot supplies as per schedule given below, reassess the decision on optimal ordering policy and total cost. **(10)**

Lot size	**Price**
Upto 149	Rs.40
150-499	Rs.39
500 or More	Rs.38

----------The End----------

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