Time: 3 hours   **Max. Marks: 80**

==

Instructions:
1) Solve any FOUR questions.
2) All question carries equal marks.
3) Figures to the right indicate full marks.
4) Assume suitable additional data, if necessary and clearly state it.

Q. 1 a) Discuss IOTWF Standardized Architecture.   (5 M)

   b) Explain Raspberry Pi with diagram.   (5 M)

   c) Describe Zigbee protocol stack using IEEE 802.15.4.   (10 M)

Q.2 a) What are gateways and backhaul sub layers?   (5 M)

   b) Briefly explain Adapting SCADA for IP.   (5 M)

   c) What do you mean by SoC? Also explain its applications.   (10 M)

Q.3 a) Describe various health & lifestyle domain specific IOT.   (5 M)

   b) Explain the different pin/parts of Arduino Uno board.   (5 M)

   c) Describe data vs. network analytics for an IoT network.   (10 M)

Q.4 a) Write short notes on BLE.   (5 M)

   b) Differentiate between Sensors and actuators with neat diagram.   (5 M)

   c) What is IoT? Explain IoT blocks in detail. List out the different IOT Challenges.   (10 M)

Q.5 a) Explain IOT Application layer with a neat diagram.   (5 M)

   b) Discuss the concept of Edge computing.   (5 M)

   c) Explain MQTT. Compare - COAP and MQTT.   (10 M)

Q.6 a) Describe Architecture of Wireless Sensor Network.   (5 M)

   b) Explain different Energy related IOTs Domain with example.   (5 M)

   c) What are IOT software platform? Explain in short with an example.   (10 M)

****

27003

Duration: 3hrs   **[Max Marks: 80]**

N.B. : (1) Question No 1 is Compulsory.
         (2) Attempt any three questions out of the remaining five.
         (3) All questions carry equal marks.
         (4) Assume suitable data, if required and state it clearly.

1		Attempt any FOUR
	a	Explain the relationship between Security Services and Mechanisms in detail.
	b	Explain ECB and CBC modes of block cipher.
	c	Define non-repudiation and authentication. Show with example how it can be achieved.
	d	Explain challenge response-based authentication tokens.
	e	Explain buffer overflow attack.

[20]

2 a Elaborate the steps of key generation using the RSA algorithm. In RSA system the   [10]
       public key (E, N) of user A is defined as (7,187). Calculate Φ(N) and private key 'D'.
       What is the cipher text for M=10 using the public key.

   b Discuss DES with reference to following points   [10]
       1. Block size and key size
       2. Need of expansion permutation
       3. Role of S-box
       4. Weak keys and semi weak keys
       5. Possible attacks on DES

3 a What goals are served using a message digest? Explain using MD5.   [10]
   b What is DDOS attack? Explain how is it launched.   [10]

4 a Why are digital certificates and signatures required? What is the role of digital signature [10]
       in digital certificates? Explain any one digital signature algorithm.
   b How does PGP achieve confidentiality and authentication in emails?   [10]

5 a State the rules for finding Euler's phi function. Calculate   [10]
       a. $\varphi(11)$
       b. $\varphi(49)$
       c. $\varphi(240)$
   b Explain Kerberos. Why is it called as SSO?   [10]

6 a Enlist the various functions of the different protocols of SSL. Explain the phases of   [10]
       handshake protocol.
   b How is security achieved in Transport and Tunnel modes of IPSEC? Explain the role of   [10]
       AH and ESP.

_____

**28998**   **Page 1 of 1**

Time: 3 Hours **Marks: 80**

1) Q.1 is compulsory

2) Attempt any **three** from remaining **five** questions

Q1) Solve any four of the following:

a)	Describe different categories of AI	[5]
b)	Describe the characteristics of a medical diagnosis system using the PEAS properties	[5]
c)	Explain Goal based Agent with a block diagram	[5]
d)	Compare and contrast propositional logic and first order logic	[5]
e)	What do you mean by hill climbing. Explain.	[5]

Q2)

a) Perform α - β pruning on the following graph, clearly indicating the
α and β cuts and the final value of root node. [10]
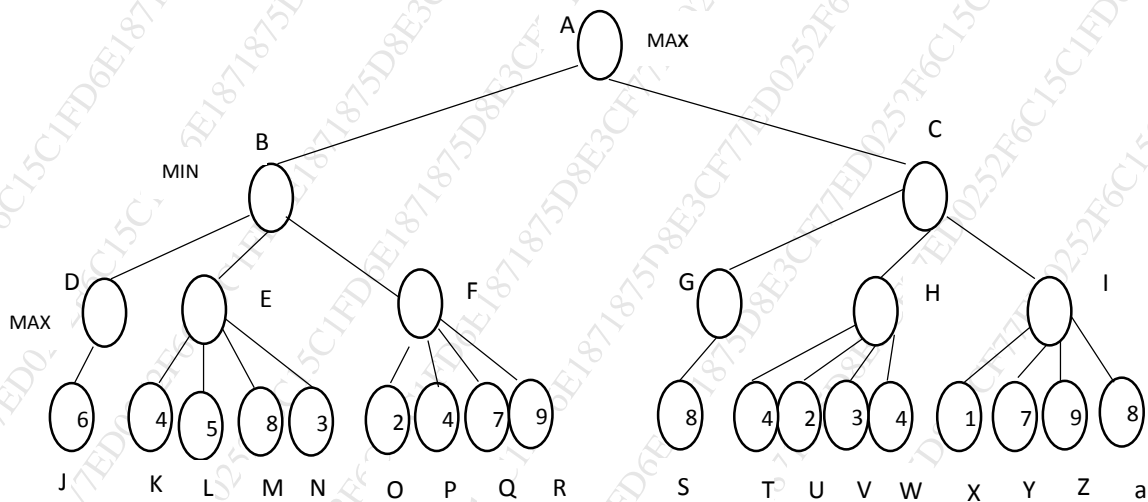
b) What do you understand by informed and uninformed search methods? Explain in detail

with example. [10]

Q3)

a) Consider the following statements: [10]

      a) All people who are earning are happy

      b) All happy people smile

      c) Someone is earning

      Perform the following tasks:

      i) Represent above statements in FOL

      ii) Convert each to CNF

      iii) Prove that someone is smiling using resolution technique. Draw the resolution tree

b) What do you understand by forward chaining and backward chaining. Explain in detail

[10]

75D8E3CF77ED0252F6C15C1FD6E18718

Q.4

a) For the given graph, the table below indicates the path costs and the heuristic values. S is the start node and G1, G2 and G3 are the goal nodes. Perform A* search to find the shortest distance path from S to any of the goal nodes. [10]
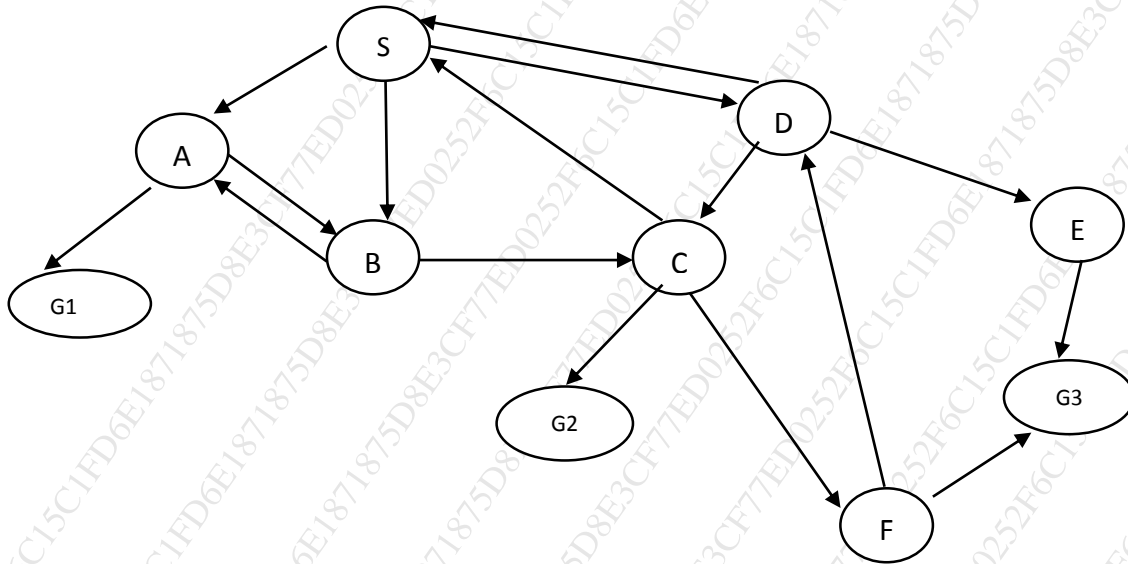
Edge	Cost	Edge	Cost	Edge	Cost
SA	5	BA	2	DS	1
SB	9	BC	1	DC	2
SD	6	CS	6	DE	2
AB	3	CG2	5	EG3	7
AG1	9	CF	7	FD	2
				FG3	8
Node	Heuristic	Node	Heuristic	Node	Heuristic
S	5	D	6	G1	0
A	7	E	5	G2	0
B	3	F	6	G3	0
C	4				

b) What is planning in AI? Discuss partial order planning and hierarchical planning in detail [10]

26341   **Page 2 of 3**

Q 5)

a) Explain the concept of genetic programming [10]

b) What is formulation of a problem. Formulate the Wumpus world problem in terms of following components: initial state, actions, successor function, goal test, path cost. [10]

Q.6   Write short notes on : [20]

a) Applications of AI

b) Simulated annealing

****

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

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

==

Q.1.	**A.**	What is three-address code? Generate three-address code for –	**5**

```
while (a<b) do
    if(c<d) then
        x:=y+z
    else
        x:=y-z
```

	B.	Compare between Compiler and Interpreter.	**5**
	C.	Explain absolute loader. State its advantages and disadvantages.	**5**
	D.	Discuss with example 'forward reference'.	**5**
Q.2.	**A.**	Construct SLR parser for the following grammar and parse the input "( )( )": $S \rightarrow (S)S \mid \varepsilon$.	**10**
	B.	State and explain with examples, different types of statements used in assemblers with respect to system programming.	**10**
Q.3.	**A.**	Explain the concept of basic blocks and flow graph with example the three-address code.	**10**
	B.	Explain with help of a flowchart, the first pass of two-pass macro processor.	**10**
Q.4.	**A.**	Explain the phases of a compiler. Discuss the action taken in various phases to compile the statement: **a=b*c+10**, where, a, b, c are of type real.	**10**
	B.	Write short note on: 　　(i) Syntax-directed Translation,　(ii) Macro facilities	**10**
Q.5.	**A.**	What is code optimization? Explain with example, the following code optimization techniques: 　(i) Common sub-expression elimination　(ii)Code motion 　(iii) Dead code elimination　　　　　　　(iv)Constant propagation	**10**
	B.	Explain Direct Linking Loader in suitable example.	**10**
Q.6.	**A.**	Test whether following grammar is LL(1) or not. If it is LL(1), construct parsing table for the same: 　　　$S \rightarrow 1AB \mid \varepsilon$ 　　　$A \rightarrow 1AC \mid 0C$ 　　　$B \rightarrow 0S$ 　　　$C \rightarrow 1$	**10**
	B.	Draw and explain the flowchart of Pass-I of two pass assembler with suitable example.	**10**

———————————

Duration: 3hrs   **[Max Marks:80]**

N.B. :   (1) Question No 1 is Compulsory.
          (2) Attempt any three questions out of the remaining five.
          (3) All questions carry equal marks.
          (4) Assume suitable data, if required and state it clearly.

1		Attempt **any FOUR**	**[20]**
	a	Explain concept of frequency reuse with clustering.	**5**
	b	Explain in short wireless LAN security threats.	**5**
	c	What is spread spectrum?	**5**
	d	Describe use of Cellular IP.	**5**
	e	Explain in short voice over LTE.	**5**
2	a	Explain in short different algorithm used for authentication and privacy in GSM.	**[10]**
	b	What is the use of different interfaces used in global system for mobile communication (GSM) with diagram?	**[10]**
3	a	Explain hidden station and exposed station problem with solution in WLAN.	**[10]**
	b	How is packet delivery achieved to and from mobile node?	**[10]**
4	a	Explain snooping TCP and mobile TCP with their merits and demerits.	**[10]**
	b	Explain the process of registration in Mobile IP.	**[10]**
5	a	Explain protocol architecture of IEEE 802.11 with diagram.	**[10]**
	b	How IP mobility is achieved in wireless network.	**[10]**
6	a	Explain different components used in LTE architecture with diagram.	**[10]**
	b	Which components are new in GPRS as compared to GSM? What is there purpose?	**[10]**