TE/CMPN/SEM-VI/C.2019/DEC.2023

Duration:3 hours **Total Marks: 80**

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

Q.1. **a)** Define "System Programming". Differentiate between system software & application software. **[05]**

b) Explain in brief "forward reference problem". Explain how TII handles forward reference problem in single pass assembler. **[05]**

c) Explain conditional macro with suitable example. **[05]**

d) Compute FIRST and FOLLOW for the following grammar: **[05]**

$S \rightarrow Aa$
$A \rightarrow BD$
$B \rightarrow b|\varepsilon$
$D \rightarrow d|\varepsilon$

Q.2. **a)** Draw the flowchart of pass1 of assembler and explain its working with the databases. **[10]**

b) What are the different ways of Intermediate code representation? Explain with example. **[10]**

Q.3. **a)** Construct the necessary data structures after compiling the following code by Pass1 of two-pass macro processor: **[10]**

```
1.  MACRO
2.  COMPUTE   &x, &a, &p
3.  MOVER     &a, &x
4.  MULT      &a, ='4'
5.  MOVEM     &a, &p
6.  MEND
7.  MACRO     &g, &k, &r
8.  MOVER     &r, &k
9.  SUB       &r, ='4'
10. MEND
```

b) Construct LR(0) parsing table for the following grammar and Analyze the contents of stack and input buffer and action taken after each step while parsing the input string "abbcbcde": **[10]**

$S \rightarrow aCDe$
$C \rightarrow Cbc$
$C \rightarrow b$
$D \rightarrow d$

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Paper / Subject Code: 89281 / System Programming & Compiler Construction

Q.4. **a)** State and explain the types of assembly language statements with examples. **[10]**

b) Discuss the databases used in direct linking loader. **[10]**

Q.5. **a)** Generate 3-address code for the following C program and construct flow graph with the help of basic blocks : **[10]**

```
i=1; j=1;x=5;
while(i<3)
{
    switch(i)   {
      case 1:   a[j++]=i+x;
                break;
      case 2:   a[j++]=i-x;
                break;     }
i++;
                }
```

b) What are the phases of compiler? Give working of each phase for the following statement: **[10]**

$$P = Q + R - S * 3$$

Q.6. **a)** Explain Dynamic Linking Loader in Detail. **[10]**

b) Explain different Code Optimization Techniques in detail. **[10]**

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TE|Sem-VI|C-2019|CMPN|Dec-2023

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 Give examples of replay attacks. List three general approaches for dealing with replay attack.

b Explain key rings in PGP.

c What are the different protocols in SSL? How do client and server establish SSL connection?

d Explain TCP/IP vulnerabilities layer wise.

e What is the purpose of S-boxes in DES? Explain the avalanche effect.

2 a What is need for message authentication? List various techniques used for message authentication. Explain any one. [10]

b What characteristics are needed in secure hash function? Explain secure hash algorithm on 512 bit. [10]

3 a Use Hill cipher to encrypt the text "short". The key to be used is hill. [10]

b Explain man in middle attack on Diffie Hellman. Explain how to overcome the same. [10]

4 a Explain IPSec protocol in detail. Also write applications and advantages of IPSec. [10]

b What are different types of firewall? How firewall is different from IDS. [10]

5 a Explain Kerberos in detail. [10]

b Provide a comparison between HMAC, CBC-MAC and CMAC. [10]

6 a What is PKI? List its components. [10]

b What is digital certificate? How does it help to validate authenticity of a user. Explain X.509 certificate format.

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Paper / Subject Code: 89283 / Mobile Computing

Time:3Hrs **marks:80**

Instructions:

1. **Question No 1 is Compulsory, Attempt any Three from Q no 2 to Q No. 6**
2. **Describe your answers with neat sketches and examples wherever necessary**
3. **Assume Suitable Data if required and mention the same in your Answer.**

Q1 a) What are various Mobile Communication and Application Environments for the Following: **10**

i) **Business**
ii) **Location Based Services.**
iii) **Banking Services**
iv) **Vehicles**

b) Explain Various Types of antennas along with their Radiation Pattern. **10**

Q2 a) What is Spread Spectrum? What are the various advantages for the same? **5**

b) What are Various Advantages and Disadvantages of Small Cells in Cellular system **5**

c) Explain DSSS and FHSS in detail. **10**

Q3 a) What do you mean by hidden & Exposed station Problem? How they can be avoided. **10**

b) Explain GSM System Architecture in Detail **10**

Q4 a) Why it is necessary to have Handover Mechanism in GSM? Explain possible handover scenarios in short. **10**

b) List various Security services offered by GSM. Explain A3 A5 and A8 Algorithm in brief. **10**

Q5 a) Explain Packet Delivery Mechanism "To and From Mobile Node" with the help of Mobile IP Network Diagram. **10**

b) Explain Tunnelling and Encapsulation in brief. What are the various types of Encapsulation techniques. **10**

Q6. Write a Short Note on the Following. (ANY FOUR). **20**

a) **Bluetooth**
b) **HIPERLAN**
c) **IPV6**
d) **CDMA**
e) **Snooping TCP**

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No student.

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(3 Hours) **Total 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 types of environment of AI agents **[5]**
b) What do you mean by Total Turing test. Explain. **[5]**
c) Explain Utility based Agent with a block diagram **[5]**
d) Formulate the 8 puzzle problem **[5]**
e) Describe the characteristics of a part picking robot using the PEAS properties **[5]**

Q2) a) What do you understand by Min Max Search and alpha beta search? Explain in detail with example. **[10]**
b) What do you understand by A* search? Is it informed or uninformed search – Justify. **[10]**

Q3) a) Explain steps involved in converting propositional logic statement into CNF with suitable example **[10]**
b) What do you understand by forward chaining and backward chaining. Explain in detail **[10]**

Q4) a) Explain various methods of knowledge representation. **[10]**
b) What are local search algorithms? Explain any one in detail. **[10]**

Q5) a) What is planning in AI? Discuss partial order planning and hierarchical planning in detail **[10]**
b) What do you understand by Reinforcement learning. Explain in detail. **[10]**

Q6) Write short notes on **any two** of the following: **[20]**

a) Wumpus World Environment
b) Applications of AI
c) Natural Language Processing

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