

TE Comp. Sem - VI (Rev) Dec. 2018

Paper / Subject Code: 31901 / Microprocessor

T.E Sem VI - Computer - choice Based - Microprocessor

15/11/18

(3 Hours)

[80 Marks]

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

2) Attempt any **Three** questions out of remaining.

3) Assume suitable data wherever necessary and state them clearly.

Q.1 a) Draw and explain memory read machine cycle timing diagram in minimum mode of 8086.

5

b) Write a short note on mixed language programming.

5

c) Explain flag register of 80386 microprocessor.

5

d) Give formats of initialization command words(ICW's) of 8259 PIC.

5

Q.2 a) Explain the maximum mode configuration of 8086 microprocessor.

10

b) Design 8086 based system for following specifications:

i) 8086 in minimum mode with clock frequency 5MHz.

ii) 64 KB EPROM using 16KB*8 chips

iii) 16 KB RAM using 8KB*8 chips

10

Q.3 a) Explain the branch prediction logic used in Pentium processor.

10

b) Draw and explain the block diagram of 8257 DMA controller.

10

Q.4 a) Explain the modes of operation of 80386 microprocessor.

10

b) i) Explain the I/O mode control word format of 8255 PPI.

5

ii) Explain an instruction issue algorithm of Pentium processor.

5

Q.5 a) Differentiate procedure and macro. Write a program to find the factorial of a number using procedure.

10

b) Explain the interrupt structure of 8086 microprocessor.

10

Q.6 a) Explain segmentation of 8086 microprocessor. Give its advantages.

10

b) Explain different addressing modes of 8086 microprocessor.

10

T-EC(Computer) Sem-II choice Based

(3 Hours)

[Total Marks : 80]

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

- (2) Attempt any 3 questions out of rest.
- (3) Make suitable assumptions if any.
- (4) All questions carry equal marks.

- | | | |
|----|---|----|
| 1. | a) Define DBA. Discuss role of DBA | 5 |
| | b) Explain Components of ER Model | 5 |
| | c) Explain ACID Properties of transaction | 5 |
| | d) Explain Database Languages | 5 |
| 2. | a) Define Deadlock. Explain Deadlock Detection, Prevention and Recovery
b) List 5 Significant differences between file processing system and Database Management System | 10 |
| 3. | a) Explain Overall Architecture of DBMS in detail
b) Construct ER diagram and convert into Relational Model for Company Which has several Employees working on different types of projects. Several Employees are working on one department. Every Employee has Manager. Several Employees are supervised by one Employee. | 10 |
| 4. | a) Explain the concept of Serializability with its types
b) Explain following Relational Algebra operations with suitable example
a) Project b) Select
b) Union d) Cartesian Product | 10 |
| 5. | a) Employee(eid,ename,address,city)
Works(eid,cid,salary)
Company(cid,cname,city)
1) Modify database so that John now lives in Mumbai
2) Find Employees who live in same city as the company for which they work.
3) Give all employees of "AZ Corporation" where there is increase in salary by 15%
4) Find the names of all employees, company name and city of residence such that Employee name begins with 'T'
5) Delete all tuples in works relation for employees of small bank corporation.
b) Define Normalization. Discuss 1NF, 2 NF and 3 NF in Detail | 10 |
| 6. | Write short notes on any two
a) Log Based Recovery
b) Constraints in SQL
c) Specialization and Generalization | 20 |

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(71)

[TIME-3 hrs.]

[Total Marks : 80]

N.B: Question No.1 is Compulsory.**Attempt any three question out of remaining questions.****Make Suitable assumption whenever necessary.****Q.1 Any -5**

4x5

- a) What are the design issues for the OSI layers?
- b) Differentiate between connection oriented and connectionless Service?
- c) List the advantages of fiber optics as a communication Medium.
- d) Explain with examples the classification of IPv4 addresses.
- e) Explain in short different framing methods.
- f) Explain the need of subnet mask in subnetting.

Q.2 a) What is topology? Explain the types of topologies with diagram, advantages and disadvantages.

10

- b) What is IPv4 protocol? Explain the IPv4 header format with diagram.

10

Q.3 a) Explain CSMA Protocols. Explain how collision are handled in CSMA/CD.

10

- b) What is Traffic shaping? Explain leaky bucket algorithm and compare it with token backed algorithm.

10

Q.4 a) What is ICMP Protocol? Explain the ICMP header format with diagram.

10

- b) Write a program for client server application using Socket Programming(UDP)

10

Q.5 a) Explain the use of TCP timers in detail.

10

- b) Compare Open Loop congestion control and Closed Loop congestion control.

10

Q.6 Write a short note on the following (Any Two)

20

- A. Internetworking Devices
- B. Distance Vector Routing
- C. ARP/RARP
- D. SMTP

T. E. (Computer) Sem - II Choice based 2/2

4. (a) Construct TM to check wellformedness of parenthesis. 10
 (b) Convert following CFG to CNF 10
 $S \rightarrow ASA \mid aB$
 $A \rightarrow B \mid S$
 $B \rightarrow b \mid \epsilon$
5. (a) Convert $(0+1)(10)^*(0+1)$ into NFA with ϵ -moves and obtain DFA. 10
 (b) Construct Moore and Mealy Machine to convert each occurrence of 100 by 101. 10
6. Write short note on following (any 4) 10
 (a) Closure properties of Context Free Language
 (b) Applications of Regular expression and Finite automata
 (c) Rice's Theorem
 (d) Moore and Mealy Machine
 (e) Universal Turing Machine

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Time: 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 Chomsky Hierarchy. 05
 (b) Differentiate between PDA and NPDA. 05
 (c) Define Regular Expression and give regular expression for
 i) Set of all strings over { 0, 1 } that end with 1 has no substring 00. 05
 (d) Explain Halting Problem. 05

 2. (a) Design a Finite State Machine to determine whether ternary number (base 3) is divisible 5. 10
 (b) Give and Explain formal definition of Pumping Lemma for Regular Language and prove that following language is not regular. 10
- $L = \{ a^m b^{m-1} \mid m > 0 \}$
3. (a) Construct PDA accepting the language $L = \{ a^{2n} b^n \mid n \geq 0 \}$. 10
 (b) Consider the following grammar 10

$$S \rightarrow iCtS \mid iCtSeS \mid a$$

$$C \rightarrow b$$

For the string 'ibtaeibta' find the following:

- (i) Leftmost derivation
- (ii) Rightmost derivation
- (iii) Parse tree
- (iv) Check if above grammar is ambiguous.

12-12-18

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Maximum Marks - 80

Duration – 3 hours

Note:

1. Question No 1 is compulsory.
2. Attempt any 3 questions from the remaining 5 questions.
3. Draw neat diagrams wherever necessary.

Q.No. 1 Explain in Brief:

- a. Characteristics of sound waves and their digital representation
- b. Different redundancies in images
- c. Working of Digital Camera
- d. Need for Quality of Service and the parameters associated.

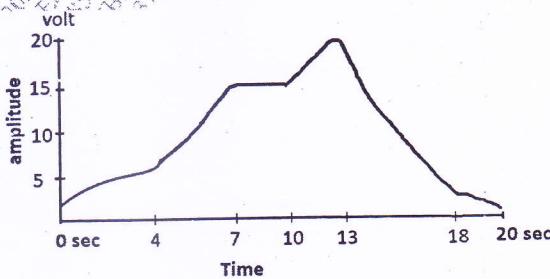
Q.No. 2(a) What are the redundancies considered in the video compression? Explain the different motion estimation techniques. 10

Q.No. 2(b) What is steganography? What are the different methods? Discuss LSB steganographic method and its merits and demerits. 10

Q.No. 3(a) What are the different features that make a text into a rich text? Explain how these formatted texts are encoded in RTF. 10

Q.No. 3(b) For the following 20 sec waveform 10

- a. Perform the sampling at every 1sec using 8 levels of quantization.
- b. Encode using PCM.
- c. Reconstruct the wave after decoding.



T.E. / Comp. / II / choice based.

12.12.18

Q.No. 4(a)

Give the architecture of multimedia streaming system on the internet and explain the role of each protocol.

10

Q.No. 4(b)

What kind of redundancy is removed by Huffman coding? For the following image histogram of an image of size 50x50 (2500 pixels) and 8 gray levels, perform Huffman coding to find the code for each gray level. Also find the reduction achieved.

10

Gray level	0	1	2	3	4	5	6	7
Count of pixels	89	600	35	73	267	565	770	101

Q.No. 5(a)

What is an authoring system? Why it is needed? Explain the different design issued faced.

10

Q.No. 5(b)

Describe the steps followed in JPEG image compression.

10

Q.No. 6°

Write short notes on any two

20

- a. MPEG compression
- b. Digital Signatures
- c. DVD

X -----

60228

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(3Hrs)

Max Marks: 80

- NB: 1. Question No.1 Compulsory.
 2. Solve any THREE from Q.2 to Q.6
 3. Assume suitable data whenever necessary with justification.

Q1 Answer any FOUR questions

- (A) Explain programming model of 8086. 05
 - (B) Explain DAA and XLAT instructions of 8086 Processor. 05
 - (C) Explain control registers of 80386. 05
 - (D) Explain assembler directives. 05
 - (E) Draw and Explain Floating Point Pipeline for Pentium Processor. 05
2. (A) Explain PPI 8255 with block diagram. 10
- (B) Draw and explain block diagram of 8254 – PIT. 10
- Q3. (A) Design 8086 based system with following specifications. 10
 - (1) 8086 working at 8MHz at minimum mode
 - (2) 256KB RAM using 64KB X 8 device
 - (3) 128KB EPROM using IC 27128.
- (B) Explain architecture of 8086 Processor with example. 10
- Q4. (A) What is multitasking? Explain how task switching is implemented on 80386 processor. 10
- (B) Explain, in brief, protection mechanism implemented on 80386. 10
- Q5. (A) Explain, with neat diagram, register window implementation on Sun Supersparc processor. 10
- (B) Explain branch prediction logic of Pentium processor. 10
- Q6. Write short notes on 10
 - (A) Page translation mechanism on 80386DX 05
 - (B) Register window on Supersparc processor 05
 - (C) Operating modes of 8254 05
 - (D) 8086 addressing modes 05

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Duration : 3 Hrs

Total Marks : 80

- N.B. : 1. Question No. 1 is Compulsory.
 2. Attempt any three questions, from remaining five questions.
 3. Figure to the right indicates full marks

- | | | |
|------|--|----|
| Q.1. | A) What are guided and unguided transmission media. | 5 |
| | B) Compare various network topologies. | 5 |
| | C) Why subnetting is required and how it is done in classful IP addressing. | 5 |
| | D) Explain FTP and the two TCP Connections. | 5 |
| Q.2. | A) Explain TCP/IP model with neat diagram and the functions of each layer. | 10 |
| | B) Explain various Internetworking devices. | 10 |
| Q.3. | A) What is the difference between static and dynamic routing ? Explain Distance Vector Routing with example. | 10 |
| | B) What is framing? Explain various framing techniques. | 10 |
| Q.4. | A) What are Berkley socket primitives? Explain in brief. | 10 |
| | B) What is error detection and correction? Explain CRC with example. | 10 |
| Q.5. | A) What is congestion control ? Explain open loop and closed loop congestion control. | 10 |
| | B) Explain in brief –
a) Telnet and SSH.
b) TCP timers | 10 |
| Q.6. | Write Short Note on (Any four) | 20 |
| | (a) TCP segment header | |
| | (b) Bluetooth Architecture | |
| | (c) Aioha and its types | |
| | (d) SNMP | |
| | (e) Design issues for various layers | |