

# T.E. Comp. Sem-V (Rev) May 2012

Rev. 01/05/2012

Con. 3925-12.

(3 Hours)

GN-6962

[ Total Marks : 100

Lib

Microprocessor

- N.B. : (1) Question No. 1 is **compulsory**.  
(2) Solve any **four** questions from remaining.  
(3) **Figures** to the **right** indicate marks.  
(4) Assume data if **necessary**.

1. (a) Explain addressing modes of 8085 microprocessor with example. 10  
(b) What is segmented memory ? State the advantages of it wrt 8086 microprocessor. 10
2. (a) What is meant by DMA ? Show interfacing of 8237/57 with 8086 and explain. 10  
(b) Explain following instructions with one example each (wrt 8086). 10  
(i) SAL (ii) TEST (iii) STOS (iv) CMP (v) JC.
3. (a) Explain the operation of IC 8259 with block diagram. 10  
(b) Write an assembly language program for 8086 to exchange the blocks of 1 kB located at 0100 H and 0200 H using string instructions. 10
4. (a) Explain Assembler directives of 8086. 10  
(b) What are the various modes of operation of 8255 PPI ? 10
5. (a) Explain the addressing modes of 8085 microprocessor. 10  
(b) Draw the timing diagram and explain for : 10  
(i) Memory read in minimum mode  
(ii) Memory write in maximum mode.
6. (a) Explain Interrupts of 8086 in detail. 10  
(b) (i) Explain Generation of Address and data Bus. 5  
(ii) Differentiate between memory mapped I/O and I/O mapped I/O. 5
7. Write short notes on any **three** :- 20  
(a) RS 232 serial Interface Standard  
(b) Memory Banking in 8086  
(c) 8284 Clock Generator  
(d) 8288 Bus Controller.

(3 Hours)

[Total Marks : 100]

Advm. Database Mgt.  
Sigs.

- N.B.:** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** out of the remaining **six** questions.  
 (3) Assume any suitable data wherever **required**.

1. You need to design a database for an art gallery. The database schema must keep information about artists, their names, (which are unique), birth places, age and style of art and photograph. For each piece of artwork, the artist, the year it was made, its unique title, its type of art (e.g. painting, sculpture, photograph), and its price, along with picture (thumbnail) must be stored. The database also stores information about customers.  
 For each customer, database stores the person's unique name, address, and total amount of money spent in the gallery and the artist and type of art the customer tends to like (can be a text).
  - (a) Draw an EER dia for the system 6
  - (b) Map the EER to Relations 8
  - (c) Take two typical queries and write them in SQL. 6
2. (a) Explain different architectures for parallel database. 10  
 (b) State comparison of RDBMS, OODBMS, ORDBMS. 10
3. (a) Explain data fragmentation, replication and allocation technique for distributed database design. 10  
 (b) Give an overview of 3-Tier client server architecture. 10
4. (a) What is SQL 3 ? Write in detail about features of SQL 3. 10  
 (b) What is well formed and valid XML document ? With example explain what is XML schema file ? 10
5. (a) Explain in detail about heuristic approach to query optimization. 10  
 (b) Explain the method for implementing the SELECT operation. 10
6. (a) Explain conceptual database design in database design and implementation process. 10  
 (b) Explain concurrency control in distributed database. 10
7. Write a short notes on (any two) :- 20
  - (a) Specialization and Generalization
  - (b) Joins in SQL
  - (c) Measures of query cost.

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

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

(3) Specify your answer with **neat** sketch and examples wherever **necessary**.

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

W. E.

1. University is planning to provide a web space for each student, where student can create his/her own web page, access necessary information, email and other applications. Consider the student's requirements related to this project, specify web Engineering team, requirement specifications, necessary Architecture, user interface (Please **Do not** specify/write any code). 20
2. (a) What are problems and restrictions in Integrated Web Design ? 10  
 (b) What is role of 'Tester' in testing Web Application ? Specify conventional approach for the same. 10
3. (a) What are components of generic web application ? Explain with suitable example. 10  
 (b) How servlet is important in developing Web Application. Explain with necessary example. 10
4. (a) What are different characteristics of web application ? Explain in brief. 10  
 (b) What are Requirement Engineering Methods towards Web Application Development ? 10
5. (a) What do you mean by User Interface Organisation? Explain. 10  
 (b) Write a brief note on Evolution of Web Engineering. 10
6. (a) Explain Product Related characteristics of Web Engineering. 10  
 (b) How SMIL can be effective in Web Application Development ? 10
7. Write a short note on any **two** of the following :- 20
  - (a) Client Side Technology
  - (b) Activex Controls
  - (c) Multimedia Data Architecture
  - (d) Middleware Technologies.

# Computer Network / Branch: Computer

Con. 4430-12.

GN-8240

(3 Hours)

[ Total Marks : 100

- N.B. : (1) Question No. 1 is compulsory.  
(2) Solve any four questions out of the remaining.  
(3) Marks assigned to the sub-questions as indicated.

1. a) With a neat diagram compare the uses and functions of different hardware components/devices used in an internetwork. (10)  
b) Compare virtual circuits and datagram subnets and show their diagrammatic representation during congestion control. (10)
2. a) What are the advantages of a variable length frame over fixed length frames. Explain the different framing methods. (10)  
b) Explain FDMA, TDMA and CDMA (10)
3. a) Derive the efficiency of Pure Aloha protocol (10)  
b) A receiver receives the code **11001100111**. When it applies the Hamming code algorithm the result is **0101**. Which bit has the error? What is the correct Hamming code? (10)
4. a) Describe the IPv4 header format in detail. (10)  
b) Explain the three protocol scenarios for establishing a connection using a 3-way handshake in TCP (10)
5. a) Explain DVR routing algorithm and mention the drawbacks of the algorithm when put into practice (10)  
b) Explain the working of Transactional TCP (10)
6. a) List the design features to be taken care of as congestion prevention policies in the different layers of network (10)  
b) Draw the layered structures and compare the two network reference models – OSI and TCP/IP (10)
7. Write notes on: (any two) (20)
  - a) SONET
  - b) Ethernet frame formats
  - c) ADSL
  - d) Satellite Communication

- N.B.: 1) Question number 1 is compulsory.  
2) Attempt any four questions out of remaining six questions.  
3) Assumptions made should be clearly stated.  
4) Figures to the right indicate full marks.  
5) Assume suitable data wherever required but justify the same.

Que 1.

- State and prove the Pumping Lemma for Regular Language. (05)
- Explain the different techniques for Turing Machine Construction. (05)
- Compare and Contrast Moore and Mealy Machine. (05)
- Prove that it is undecidable whether Context free grammar is ambiguous. (05)

Que 2.

- Write a regular expression for the following languages. (10)
  - The set of all the strings such that the number of 0's is odd.
  - The set of all the strings that do not contain 1101.
- Convert the following NFA to DFA (10)
 

p is the initial state and r and s are the final state

$\delta$	0	1
$\rightarrow p$	{p,r}	{q}
q	{r,s}	{p}
r*	{p,s}	{r}
s*	{q,r}	{}

Que 3.

- Show that every regular language is a context free language (10)
 

Hint: Construct a CFG by induction on the number of operators in the regular expression.
- A Palindrome is a string that equals its own reverse, (10)
 

such as 0110 or 1011101. Use the pumping lemma to show that the set of palindromes is not a regular language.

Que 4.

- Design a PDA to accept each of the following languages (10)
  - $\{0^n 1^m 0^n \mid m, n \geq 1\}$
  - $\{0^n 1^m 0^m 0^n \mid m, n \geq 1\}$
- Convert the grammar (10)
 

S  $\rightarrow$  0AA

[ TURN OVER

$$A \rightarrow 0S|1S|0$$

to a PDA that accepts the same language by empty stack.

Que 5.

a. Begin with the grammar:

(14)

 $S \rightarrow ABC|BaB$  $A \rightarrow aA|BaC|aaa$  $B \rightarrow bBb|a|D$  $C \rightarrow CA|AC$  $D \rightarrow \epsilon$ 

- i. Eliminate  $\epsilon$  Productions.
- ii. Eliminate any unit production in the resulting grammar.
- iii. Eliminate any useless symbols in the resulting grammar.
- iv. Put the resulting grammar into Chomsky Normal Form.

b. Prove that  $L = \{a^n \mid n \text{ is prime}\}$  is not context free.

(06)

Que 6.

a. Design a Turing Machine for the following language.

(10)

"set of all the strings of balanced parentheses"

b. Convert the following grammar into Greibach Normal Form.

(10)

 $S \rightarrow AB1 \mid 0$  $A \rightarrow 00A \mid B$  $B \rightarrow 1A1$ 

Que 7.

a. Myhill-Nerode Theorem.

(05)

b. Post Correspondence Problem.

(05)

c. Universal Turing Machine.

(05)

d. The Classes P and NP.

(05)