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

N.B. 1. Question No 1 is compulsory.
2. Solve any **three** questions out of remaining five questions.
3. Assume suitable data if necessary.
4. Figures to right indicate marks.

Q. 1. Solve any **four** out of five. (4*5=20)

a. Draw and explain instruction execution cycle.

b. Explain memory hierarchy with the help of diagram.

c. What are the various means of I/O communication?

d. With the help of diagram, explain Von-Neumann's architecture.

e. Explain the IEEE 754 double precision standard of floating point representation.

Q. 2. a) Multiply (- 3) and (3) using Booth's Algorithm. (10)
b) Explain 6 stage instruction pipeline with suitable diagram. (10)

Q. 3. a) Compare RISC & CISC. (10)
b) Consider the string 8,3,9,4,9,8,5,8,3,9,6,7,5,4,3 (10)
Find the page faults for 3 frames using FIFO, Optimal, & LRU page replacement policies.

Q. 4. a) Divide 7 by 2 using non restoring division algorithm. (10)
b) Explain Flynn's classification in detail. (10)

Q. 5. a) Discuss the various characteristics of Memory. (10)
b) Explain design of control unit w.r.t. microprogrammed and hardwired approach. (10)

Q. 6. a) Explain different addressing modes with example. (10)
b) What is the need of DMA? Explain its various techniques of data transfer. (10)

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

N.B. : (1) Question **No. 1** is compulsory.
(2) Solve any **three** questions out of remaining questions.
(3) Assume suitable data if required.

1. (a) Discuss any five CSS text properties. **5**
   (b) Explain the *for* loop used in PHP. **5**
   (c) Explain the functions of a web server. **5**
   (d) List and explain common cross browser compatibility issues. **5**

2. (a) Write a program that shows a message as Good Morning, Good Afternoon or Good Night according to the current time by using the *if* statement in JavaScript. **10**

   (b) Write HTML code to draw the following table: **10**

Time Table					
Hours	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**
	Science	Maths	Science	Maths	Arts
	Social	History	English	Social	Sports
	Lunch				
	Science	Maths	Science	Maths	Project
	Social	History	English	Social	

3. (a) Explain ASP.NET application lifecycle. **10**
   (b) Describe string manipulation and date and time built-in functions in PHP **10**

4. (a) How a database can be connected using ADO.Net? Explain with a suitable example. **10**
   (b) Explain different types of XSL elements. **10**

5. (a) What is JQUERY? Illustrate the use of JQUERY for form validation. **10**
   (b) Explain servlet life cycle in detail. **10**

6. Write short notes on **(any four)**: **20**
   (i) Three-tier architecture of web application
   (ii) Website design issues
   (iii) PHP and MySQL database connectivity
   (iv) Session tracking
   (v) Use of RSS web feeds

Duration: 3 Hours **Total Marks: 80**

Note:
(1) Questions No. 1 is compulsory.
(2) Solve any three questions from remaining questions.
(3) Draw suitable diagram whenever necessary.
(4) Assume suitable data if necessary.

Q1 **Answer Any four** **(20)**

(a) Explain PSTN.

(b) Explain selective repeat protocol.

(c) Explain CRC with example.

(d) Compare Circuit switched and packet switched network.

(e) What is IP address, MAC Address and port address.

Q2. (a) Explain the Taxonomy of multiple access protocols. **(10)**

(b) What is Slotted ALOHA and Pure ALOHA? What is the efficiency? Justify your answer. **(10)**

Q3. (a) Explain TCP Congestion Control. **(10)**

(b) Explain IEEE 802.3, 802.4 and 802.5 standard. **(10)**

Q4. (a) Explain TCP sliding window protocol with neat diagram. **(10)**

(b) What is subnet mask? Explain subnetting and supernetting with example. **(10)**

Q5. (a) Compare OSI and TCP network models. **(10)**

(b) Explain HDLC protocol with suitable diagram. **(10)**

Q6. Write short note on **(Any Four)** **(20)**

(a) Satellite Communication

(b) Examine the advantages of LAN, MAN and WAN.

(c) Differentiate between connectionless and connection oriented services.

(d) Mobile Telephone System.

(e) Link State Routing.

(3 Hours) **Marks : 80**

Note :

1. Question No.1 is compulsory.
2. Attempt any three question form reaming question.
3. Draw suitable diagram whenever necessary.

Q.1:

a) Construct NFA for accepting the set of all strings over the input $\sum = \{0,1\}$, whose second last symbol is 1 (**05**)

b) State and explain limitations and power of Finite Automata. (**05**)

c) Design a Moore machine for binary number divisible by 3 (**05**)

d) Give formal definition of a Push Down automata (PDA) (**05**)

Q2. a) Convert the following grammar to CNF (**10**)

S→ Ba / aB

A→bAA / aS / a

B→aBB / bS / b

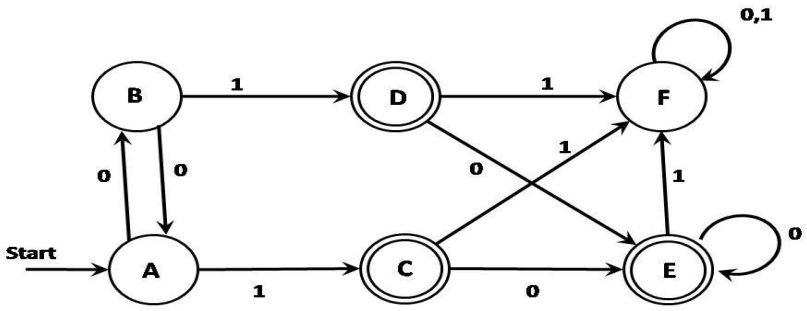
b) Design DFA to accept

i. Binary Strings in which every 0 is followed by 11 (**05**)

ii. String over the binary alphabet that do not contain the substring 010 (**05**)

Q.3:

a) Minimize the following DFA. (**10**)



b) Convert the following NFA to DFA(final state is marked with *) (**10**)

∂	**0**	**1**
p	p,q	p
q	r	r
r	s	---
*s	s	s

Q.4:

a) Design PDA for recognizing L= **{ $a^n b^m a^n$ | m, n >=1 }** (**10**)

b) Design a Turing Machine to recognize the language L = {**$a^n b^n a^n$ | n >=1**} (**10**)

Q.5:

a) Using the pumping Lemma prove that the following language is not regular

L= { ww | w= {0 , 1}* } (**10**)

b) Design Melay machine to accept all the strings ending with 00 or 11 (**10**)

Q.6: Write a Short Note on (any **four**) (**20**)

a) Chomsky Hierarchy.
b) Applications of Automata theory
c) Universal Turing Machine
d) Post correspondence Problem
e) Halting Problem

(3 Hours) [Total Marks : 80]

Instructions:
(1) Question no 1 is Compulsory
(2) Write any Three from Remaining
(3) Assume suitable data if necessary

Question No.		Max. Marks
Q 1 (a)	Differentiate Lossy and Lossless Compression	04
Q 1 (b)	Define Cyclic and BCH codes	04
Q 1 (c)	List four properties of Information	04
Q 1 (d)	Explain three Security Goals of Cryptography.	04
Q 1 (e)	State and explain Fermat's Little theorem with example	04
Q2 (a)	With example explain Convolution codes and Cyclic codes	10
Q2 (b)	Describe AES in relation with cryptography	05
Q2 (c)	Explain Digital Signature	05
Q3 (a)	For (7,4) linear block code $H=\begin{bmatrix} 1&1&1&1&0&1&0 \\ 0&1&1&1&0&1&0 \\ 1&1&1&0&1&0&0 \end{bmatrix}$ Find 1. Generator matrix 2. All code vectors 3. Number of error that can be detected and corrected	10
Q3 (b)	Define different types of Entropy	05

TURN OVER

Q3 (c)	Define different Security attacks that is threat to Integrity	05
Q4 (a)	Consider a Telegraph source having two symbols Dot and Dash .The Dot duration is 0.2 sec and dash duration is 3 times Dot duration .The probability of dot occurring is twice that of Dash and time between symbols is 0.2 sec. Calculate the information rate of Telegraph source	10
Q4 (b)	With block diagram explain JPEG Encoder and Decoder in detail	10
Q5 (a)	Encode the string using LZW Technique bananananan	10
Q5 (b)	Compare Symmetric and Asymmetric key cryptography.	05
Q5 (c)	Use the Euclidean,s algorithm to find gcd (1819,3587).	05
	Write short notes	
Q6 (a)	RSA algorithm	05
Q6 (b)	Dictionary based compression	05
Q6 (c)	Code efficiency and redundancy	05
Q6 (d)	Shannon's Limit	05