Q.P. Code : 13124

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

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

Q. 1 Answer **(any 4)** 20

a) What are the functions of data link layer?
b) What is IP address, MAC address and Port address
c) How many networks and Hosts are possible using 'Class B' IP address? What is a subnet mask?
d) Compare Windows and Linux Operating system
e) What is p - persistent CSMA
f) Compare Circuit switched and Packet switched networks

Q. 2 a) Explain the frames of HDLC with a neat diagram. 10
b) Explain the OSI model in detail. List the networking devices used at each layer of the OSI model 10

Q. 3 a) Explain DVR with an example. What are the problems in DVR algorithm? 10
b) What is the difference between Stop and wait and Sliding window protocol? Explain Selective Repeat technique 10

Q. 4 a) Explain lP V4 header with a neat and labeled diagram, 10
b) What is congestion? Explain any one algorithm to control congestion in a network 10

Q. 5 a) Draw and explain TCP segment header. 10
b) What is Routing? Explain OSPF in detail. 10

Q. 6 Write short notes on **(any 4)** 20

a) Satellite Communication
b) ALOHA and its types
c) Switches, Repeaters, Gateway
d) TCP timers
e) CRC with an example

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Q.P. Code :23710

[Time: Three Hours] **[Marks:80]**

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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 Attempt **any 4** sub questions.

a) Define the terms Computer Organization and Computer Architecture. **(05)**
b) Draw and explain single and double precision IEEE 754 binary floating point representation formats. **(05)**
c) List and Explain important parameters significant in choosing a computer memory. **(05)**
d) Draw and explain five stage instruction pipelining. **(05)**
e) Explain Programmed I/O technique of Data transfer. **(05)**

Q. 2 a) Calculate the number of page hits and faults using FIFO, LRU and OPTIMAL page replacement algorithms for the following page frame Sequence: 5,6, 6, 3, 8, 5, 7, 8, 6, 5, 8, 5. (FRAME SIZE = 3). **(10)**
b) Draw and explain basic instruction execution cycle. **(10)**

Q. 3 a) Explain memory hierarchy of a computer. **(10)**
b) Describe Flynn's classification in detail. **(10)**

Q. 4 a) Describe different addressing modes. **(10)**
b) Draw the flowchart of Booths algorithm and multiply (6)*(-4) using Booths algorithm. **(10)**

Q. 5 a) Explain interrupt driven I/O technique of Data transfer. **(10)**
b) Explain hardwired approach to the design of a control unit. **(10)**

Q. 6 Write notes on **(any three)** **(20)**
a) Register Organization of a processor
b) Von Neumann architecture
c) Associative memory
d) Nano Programming
e) Pipeline Hazards

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[Time: 3 Hours] **[Marks: 80]**

N.B. : (1) Question No.1 is compulsory.
(2) Answer any 3 questions from remaining.
(3) Figures to the right indicate full marks
(4) Assume suitable data if required

Q1. a) Differentiate between Lossy and Lossless compression. 4M
b) Explain Properties of Information. 4M
c) Differentiate Compression Rate from Compression Ratio 4M
d) State and explain Fermat's Little theorem with suitable example. 4M
e) Explain Security attacks with respect to cryptography. 4M

Q 2 a) Explain JPEG Encoder and Decoder in detail (10M)
b) Describe DES in detail. (05M)
c) Define following terms (05M)
1. Code Efficiency
2. Hamming Distance
3. Minimum Distance (d_{min})
4. Hamming Weight
5. Cyclic code

Q.3 a) For (6,3) systematic linear block code, the parity check bits are C4,C5, &C6 are formed from following equation. (10M)
C4=d1+d3
C5=d1+d2+d3
C6=d1+d2
+ indicates ex-or operation
1. Write down generator matrix
2. Construct all possible codewords
3. Find parity check matrix

b) Differentiate between block cipher and stream cipher. (5M)
c) Explain cyclic codes and BCH codes. (5M)

Q 4.a) Explain Convolution code. (05M)
b) Encode the string using LZW Technique. (10M)
bananan an
c) Write short notes on Random number generator. (05M)

Turn Over

Q 5 a)	Explain Diffie –Hellman Algorithm.	(05M)
b)	A discrete source emits one of five symbols once every 1mS ,the symbol probabilities are 1/2, 1/4 ,1/8 ,1/16, & 1/16 respectively Find Source entropy and Information rate	(10M)
c)	Find gcd of (1575,231). by Euclid's Algorithm.	(05M)

Q6. Write short notes (20M)

a. Security Goals
b. Chinese Remainder Theorem
c. Digital Signature
d. Speech Compression

Q.P. Code: 25530

Duration: 3 hours **Total marks: 80**

Note (1) Question No. 1 is compulsory

(2) Attempt any three questions from remaining questions

(3) Draw suitable diagrams wherever necessary

(4) Assume suitable data, if necessary

Q 1. (a) Construct a DFA that accepts all the strings on {0, 1} except those containing the substring 010. (**05**)

(b) Find the CFG for the regular expression (11)*(010+01)*. (**05**)

(c) Write short note on Chomsky Hierarchy. (**05**)

(d) Give formal definition on NFA with epsilon. (**05**)

Q 2. (a) Write NFA for accepting regular Expression (b+ab)*(ba*+b). (**10**)

(b) Design a Moore and Mealy machine for a binary input sequence such that if it has a substring 010 the machine outputs A if input has substring 101 it outputs B otherwise it outputs C. (**10**)

Q 3 (a) Use pumping lemma to show that the set of palindromes is not a regular Language. (palindrome is a string that equals its own reverse, such as 0110). (**10**)

(b) Minimize the following DFA where q_0 is a start state and q_1, q_2 and q_4 are final states. (**10**)

∂	0	1
q_0	q_3	q_1
q_1	q_2	q_5
q_2	q_2	q_5
q_3	q_0	q_4
q_4	q_2	q_5
q_5	q_5	q_5

Q 4 (a) Explain rules for simplification of CFG. (**10**)

(b) Convert given CFG to CNF (**10**)

S→ASB | ε

B →SbS | A | bb

A→aAS | a

Q 5 (a) Design a PDA to accept the language {L = $a^m b^m c^n$ | m, n>=1} (**10**)

(b) Construct TM for checking well formness of the parenthesis. (**10**)

Q 6 Write short notes on (Any two) (**20**)

(a) Pumping Lemma for Regular Languages

(b) Universal Turing Machine.

(c) Unsolvable Problems
