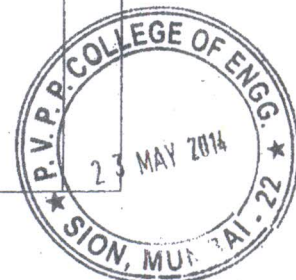


(3 Hours)

[Total Marks :80]

- N.B. (1) Question No. 1 is **Compulsory**.  
 (2) Attempt any **three** questions out of remaining questions.  
 (3) Figures to the right indicate full marks.  
 (4) Assumptions made should be clearly stated.  
 (5) Assume suitable data wherever required and justify it.

1	(a) What is a network? What are its goals and applications?	05
	(b) Discuss and compare various types of networks.	05
	(c) Is there any relationship between transmission media and topology?	05
	(d) What are the goals of TCP/IP Model?	05
2	(a) What is OSI Model? Explain the functions and protocols and services of each layer.	10
	(b) Describe about the different Guided transmission Medias.	10
3	(a) Explain the functions of data link layer.	10
	(b) Explain the Taxonomy of multiple access protocols.	10
4	(a) Explain different categories of routing algorithms.	10
	(b) What is IP addressing? How it is classified? How is subnet addressing is performed.	10
5	(a) What are the elements of transport protocols?	10
	(b) Explain TCP Congestion Control.	10
6	Write short notes on (any 4):- a) Connection oriented and connectionless service. b) Sliding window protocol. c) Mobile Telephone system. d) Communication Satellite e) Internet Control protocols. f) UDP	20





A.T.

QP Code : NP-19812

(3 Hours)

[ Total Marks : 80

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Solve any **three** questions from remaining questions.  
 (3) **Draw suitable diagrams** wherever **necessary**.  
 (4) Assume suitable **data**, if **necessary**.

1. (a) Design a DFA to accept strings over the alphabet  $\Sigma = \{a, b\}$  containing even number of 'a's. 5  
 (b) Let G be the grammar. Find the leftmost derivation, rightmost derivation and parse tree for the expression  $a^*b+a^*b$  5
- G:  $S \rightarrow S + S \mid S * S$   
 $S \rightarrow a \mid b$
- (c) Give formal definition of a Push Down Automata (PDA) 5  
 (d) State and explain closure properties of regular languages. 5
2. (a) Design a DFA to accept 10  
 (i) Binary strings in which every 0 is followed by 11  
 (ii) Strings over the binary alphabet that do not contain the substring 010
- (b) Design a Mealy machine over the alphabet  $\{0,1\}$  which outputs EVEN, ODD according to the number of 1's encountered as even or odd. 10
3. (a) (a) Using pumping lemma prove that the following language is not regular 10  
 $L = \{ ww \mid w \in \{0, 1\}^* \}$   
 (b) Design a NFA for accepting input strings that contain either the keyword 000 or the keyword 010 and convert it into an equivalent DFA. 10
4. (a) Construct a PDA accepting the following language  $L = \{a^n b^m a^n \mid m, n \geq 1\}$  10  
 (b) Design a Turing machine to recognize the language  $L = \{a^n b^n \mid n \geq 1\}$  10



QP Code : NP-19812

2

5. (a) Explain algorithm for the conversion of a Context Free Grammar ( CFG) to Chomsky Normal Form ( CNF) and use it to convert the following CFG to CNF 10  
 $S \rightarrow bA \mid aB$   
 $A \rightarrow bAA \mid aS \mid a$   
 $B \rightarrow aBB \mid bS \mid b$
- (b) Convert the following Context Free Grammar to GNF 10  
 $S \rightarrow AB \mid BC$   
 $A \rightarrow AB \mid a$   
 $B \rightarrow AA \mid CB \mid b$   
 $C \rightarrow a \mid b$
6. Write short notes on (any two) 20  
(a) Variants of a Turing Machine  
(b) Post Correspondence Problem  
(c) Chomsky Hierarchy  
(d) Recursive and recursively enumerable languages.
- 

Con. 12999-14.



(OLD COURSE)

QP Code : MV-18813

(3 Hours)

[ Total Marks : 100

N.B. (1) Question no. 1 is compulsory.

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

(3) Use of statistical table is permitted.

1. (a) Find a root  $xe^x - 2 = 0$  by Newton's Raphson's method correct to three decimal places. 5
- (b) A box contains n ticket 1, 2, ..... n if m ticket are drawn at random from box what is expectation of sum of number on ticket drawn. 5
- (c) The life time of a certain brand of electric bulb may be considered a random variable with mean 1200 hrs and standard deviation 250 hrs. Using central limit theorem find probability that average lifetime of 60 bulbs exceeds 1250 hrs. 5
- (d) Find all basic feasible solution of following system of equation 5
- $$\begin{aligned} \text{Max } Z &= x_1 + 3x_2 + 3x_3 \\ \text{Subject to } x_1 + 2x_2 + 3x_3 &= 4 \\ 2x_1 + 3x_2 + 5x_3 &= 7 \end{aligned}$$
2. (a) Calculate value of  $\int_{0.2}^{1.4} (\sin x - \log_e x + e^x)$  by Simpson's  $\frac{3}{8}$  th rule. 6
- (b) In a sampling of large number of parts produced by a machine the mean number of defectives in a sample of 20 is 2. Out of 1000 such sample, how many sample would you expect to contain at least 3 defectives. 6
- (c) Solve the following LPP by simplex method. 8
- $$\begin{aligned} \text{min } z &= x_1 - 3x_2 + 3x_3 \\ \text{subject to } 3x_1 - x_2 + 2x_3 &\leq 7 \\ 2x_1 + 4x_2 &\geq -12 \\ -4x_1 + 3x_2 + 8x_3 &\leq 10 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$
3. (a) Apply Gauss Jordan method to solve equations : 6
- $$\begin{aligned} x + y + z &= 9 \\ 2x - 3y + 4z &= 13 \\ 3x + 4y + 5z &= 40. \end{aligned}$$
- (b) Find f(9) from : 6
- |     |     |     |      |      |      |
|-----|-----|-----|------|------|------|
| x : | 5   | 7   | 11   | 13   | 17   |
| y : | 150 | 392 | 1452 | 2366 | 5202 |
- (c) Find r and R from following table : 8
- |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|
| x : | 12  | 17  | 22  | 27  | 32  |
| y : | 113 | 119 | 117 | 115 | 121 |

[ TURN OVER

Con. 9884-14.



4. (a) If mean of following distribution is 16. Find  $m$  and  $n$  and variance. 6
- |      |   |               |     |     |               |                |
|------|---|---------------|-----|-----|---------------|----------------|
| X    | : | 8             | 12  | 16  | 20            | 24             |
| p(x) | : | $\frac{1}{8}$ | $m$ | $n$ | $\frac{1}{4}$ | $\frac{1}{12}$ |
- (b) Fit a poisson distribution of following data. 6
- |                 |     |    |    |   |   |
|-----------------|-----|----|----|---|---|
| No. of deaths : | 0   | 1  | 2  | 3 | 4 |
| frequencies :   | 123 | 59 | 14 | 3 | 1 |
- (c) Based on following data determine if there is relation between literacy and smoking. 8
- |             |         |             |
|-------------|---------|-------------|
|             | Smokers | Non Smokers |
| Literates   | 83      | 57          |
| Illiterates | 45      | 68          |
5. (a) In a distribution exactly normal 7% of items are under 35 and 89% under 63. What are mean and standard deviation? 6
- (b) Find  $f(4.4)$  from following table : 6
- |        |    |   |   |   |    |    |    |
|--------|----|---|---|---|----|----|----|
| X :    | 0  | 2 | 4 | 6 | 8  | 10 | 12 |
| f(x) : | 12 | 7 | 6 | 7 | 13 | 32 | 77 |
- (c) Given the following distribution : 8
- |        |      |     |     |     |     |      |
|--------|------|-----|-----|-----|-----|------|
| X :    | -3   | -2  | -1  | 0   | 1   | 2    |
| p(x) : | 0.01 | 0.1 | 0.2 | 0.3 | 0.2 | 0.15 |
- Find (i)  $P(x \geq 1)$  (ii)  $P(x < 0)$  (iii)  $E(x)$  (iv)  $V(x)$ .
6. (a) If a random variable  $x$  follows Poisson distribution such that  $P(x=2) = 9P(x=4) + 90P(x=6)$ . Find mean and variance of  $x$ . 6
- (b) A certain injection administered to 12 patients resulted in following change of blood pressure. 6
- 5, 2, 8, -1, 3, 0, 6, -2, 1, 5, 0, 4
- Can it be concluded that injection will be general accompanied by an increase in blood pressure.
- (c) A continuous random variable has P.D.F. 8
- $$f(x) = 6(x - x^2) \quad 0 \leq x \leq 1$$
- Find (i) mean (ii) variance (iii)  $P(|x - m| < \sigma)$  (iv)  $P(\mu - 2\sigma < x < \mu + 2\sigma)$ .
7. (a) The average of marks scored by 32 boys is 72 with standard deviation 8 while that of 36 girls is 70 with standard deviation 6. Test at 5% LOS whether boys perform better than girls. 6
- (b) The regression lines of sample  $x + 6y = 6$  and  $3x + 2y = 10$  find 6
- (i) Sample mean  $\bar{X}$  and  $\bar{Y}$  (ii) Coefficient of correlation between  $x$  and  $y$  also estimate  $y$  when  $x = 12$ .
- (c) Fit a second degree parabolic curve of the following data and estimate production in 1982. 8
- |              |   |      |      |      |      |      |      |      |      |
|--------------|---|------|------|------|------|------|------|------|------|
| Year X       | : | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 |
| Production Y | : | 12   | 14   | 26   | 42   | 40   | 50   | 52   | 53   |

**(OLD COURSE)****QP Code : MV-18852****(3 Hours)****[ Total Marks : 100**

- N.B. :** (1) Question No.1 is compulsory.  
 (2) Solve any four questions of the remaining.

1. Design an 8086 based up system with specifications - 20  
 8086 working with 8 MHz  
 64K RAM using 62256 dip  
 64 K EPROM using 27256 dip.  
 2 - 16 bit I/O port in handshake mode.  
 Draw -  
 (i) Memory map and I/O  
 (ii) Interfacing design  
 (iii) Explain the concept of absolute decoding and the system design.
2. (a) Explain the various parameter instructions passing techniques to a procedure using examples. 10  
 (b) Explain JUMP and CALL instructions of 8051 micro controller with examples. Also explain the different types of CALLS with an example. 10
3. (a) Explain timer counter of 8051. 10  
 (b) Explain hardware and software interrupts of 8051  $\mu$ C in detail. 10
4. (a) Write an assembly language program for 8086  $\mu$ p to check whether the given alphanumeric string is a PALINDROME. 10  
 (b) Explain what is meant by segmentation and hence explain the logical and physical address of 8086. 10
5. (a) Explain the addressing modes of 8086  $\mu$ p with examples. 10  
 (b) Explain the instructions of 8086 with examples - DAA, INTO, JS, DAS. 10
6. (a) Explain 8051 register banks and stack. 10  
 (b) Explain the interfacing of 8051 with 8255 PPI. 20
7. Write short notes on (any two) :-  
 (a) Mixed language programming with example.  
 (b) Comparison between minimum and maximum mode of 8086.  
 (c) Assembles directives.

**Con. 11656-14.**



Sem IV I.T. (old)

29/05/14

(OLD COURSE)

I.P.

QP Code : MV-18888

(3 Hours)

[Total Marks : 100

Note:

1. Question No 1 is compulsory.
2. Attempt any Four questions from remaining Six questions.
3. Assume suitable data wherever necessary.
4. Figures to the right indicate full marks.

- Qu-1 a) Write a java script to validate a form consisting of name, age, address, gender (radio button), state and country (drop down menu). 10  
b) With neat labeled diagram explain the SOA architecture. 10
- Qu-2 a) Explain different ASP objects in detail. 10  
b) Explain the in-built objects provided in JavaScript with their properties and methods. 10
- Qu-3 a) Explain significance of cascading style sheets. Explain types of CSS with example. 10  
b) List and explain all the elements that are available for getting input from the user in HTML. 10
- Qu-4 a) Give the difference between XML and HTML. What are features of XML elements and attributes? 10  
b) What is document type definition? 5  
c) Explain need of frames in web browser with example. 5
- Qu-5 a) Compare and contrast 10  
i) Get and Post HTTP method.  
ii) HTML and DHTML  
b) What are cookies? Explain in detail its use in session tracking. 10
- Qu-6 a) What do you mean by web feeds? 5  
b) What do you mean by domain name system. 5  
c) Design any application which makes use of following controls. 10  
i) Text box ii) Radio Button iii) List box iv) Check box v) Labels
- Qu-7 Write short note on any two. 20  
a) Web services  
b) E-commerce  
c) JSP

Con. 12182-14.



PCE

(OLD COURSE)

(3 Hours)

[ Total Marks: 100]

N.B. : 1) Question NO.1 is compulsory.

2) Attempt any four questions out of the remaining six questions.

3) Figures to the right indicate full marks.

4) Assume suitable data if necessary.

Q1) a) In filter method of SSB generation, why low frequency carrier is used initially. (05)

b) Why is an amplitude limiter stage required in FM broadcast receiver. (05)

c) Compare ASK and FSK. (05)

d) What is noise ? Name important components of internal and external noise. (05)

Q 2) a) A Trasmmitter (AM DSBFC) with a carrier power of 10 W at a frequency of (10)

25MHz operates into a 50 ohms load. It is modulated at 60% by a 2 KHz sine wave.

1) Sketch the spectrum of AM wave

2) What is the total signal power?

3) What is the RMS voltage of the signal?

b) Signal to noise ratio at output of amplifier is 200. What is its value in decibels. (04)

c) What are the Energy signals and Power signals? Give example in each case (06)

Q 3) a) Explain Satellite communication system. List its applications in communication. (10)

b) A carrier  $A_c \cos \omega_m t$ , is amplitude modulated by message signal  $A_m \cos \omega_m t$ , where (10)

$$A_m < A_c$$

i. Find expression for AM signal.

ii. Sketch spectrum of AM signal.

Q 4) a) What is aliasing ? How it can be reduced or avoided (05)

b) Explain how PAM signals are generated and demodulated. (10)

c) What is diagonal clipping, How it can be avoided (05)

Q5) a) How Adaptive DM is improvement of linear DM. Draw block diagram of Adaptive DM and explain its working. (10)

b) Draw and explain block diagram of four channel FDM system. (10)

Q6) a) Justify the following statements (10)

i) Good image signal suppression requires IF to be high.

ii) Good adjacent channel selectivity can be obtained by choosing a low value of IF

b) Explain working of Foster- Seeley detector for FM. (10)

Q 7) Write short notes on: (20)

i) Basic block diagram of Analog Communication System.

ii) Pre-emphasis and De-emphasis.

iii) Time scaling property of Fourier transform.

iv) A-law companding and  $\mu$ -law companding

Con. 12966-14.

