

( 3 Hours )

[ Total Marks : 100

**N.B. :** (1) Question No. 1 is **compulsory**.(2) Solve any **four** questions out of remaining **six** questions.(3) Draw the **diagrams** wherever **necessary**.(4) Assume **suitable** data if **required**.

- |   |  |    |
|---|--|----|
| 1 | (a) How many 128 bytes RAM chips are required to provide a memory of 4096 bytes ? Show decoder configuration, address bus and databus. | 10 |
|   | (b) What is virtual memory ? Explain the paging technique in details.  | 10 |
| 2 | (a) Explain Flynn's classification in detail.  | 10 |
|   | (b) Explain different RAID levels used for storage.  | 10 |
| 3 | (a) Differentiate between RISC and CISC processors.  | 10 |
|   | (b) Explain Van Neumann Architecture in details.   | 10 |
| 4 | (a) Define the terms :-  | 10 |
|   | (i) Memory Access Time   |    |
|   | (ii) Memory Cycle Time   |    |
|   | (iii) Cache Block  |    |
|   | (iv) Locality of Reference.  |    |
|   | (b) Explain pipelining and its performance.  | 10 |
| 5 | (a) Explain Cache coherence strategies in single processor and multiprocessor systems.   | 10 |
|   | (b) Explain Booth's Algorithm with suitable example.   | 10 |
| 6 | (a) Explain memory interleaving techniques with its advantages.  | 10 |
|   | (b) Explain DMA operation in details.  | 10 |
| 7 | Write short note on any <b>two</b> :-  | 20 |
|   | (a) SPARC Processor  |    |
|   | (b) Hardwired and Microprogrammed Control Unit   |    |
|   | (c) Wave Front Array   |    |
|   | (d) IEEE Floating Point Number Format.   |    |

- N.B. 1. Question No. 1 is compulsory  
 2. Attempt any FOUR from remaining six questions.  
 3. Figures to the right indicate the full marks.  
 4. Assume the suitable data if needed with justification.

Q.1 .. Probability of 'A' hitting a target is  $\frac{2}{5}$ , Probability of 'B' hitting a target is  $\frac{1}{5}$ , Probability of 'C' hitting a target is  $\frac{4}{5}$ . If they fire the target what is the probability that at least two shots hit the target? 5

b. Find the roots of the following equation by using Newton-Raphson method correct up to 4 decimal places  $x^3 - 5x + 3 = 0$  with  $x_0 = 2$

c. A company markets car tires. Their lives are normally distributed with mean 40,000k.m. and standard deviation 3,000 k.m. A change in a production process is believed to result in a better product. A test sample of 64 new tires has mean life of 41200 k.m. Can you conclude that there is no significant difference between new product mean and current mean?

d. A person wants to decide the constituents of a diet which will fulfill his daily requirements of proteins, carbohydrates at the minimum cost. The choice is to be made from four different types of foods. The yield per unit is given below. 5

Food type	proteins	fats	carbohydrates	Cost per units (Rs.)
1	3	2	6	45
2	4	2	4	40
3	8	7	7	85
4	6	5	4	65
Minimum requirement	800	200	700	

Formulate the L.P.P.

Q.2 a. Solve the following by using Gauss-Seidel method. 6  
 $20x + y - 2z = 17$ ,  $3x + 20y - z = -18$ ,  $2x - 3y + 20z = 25$ .

b. An irregular 6 faced dice is thrown. The probability that in 10 throws it will give 5 even numbers is twice as likely that it will give four even numbers. How many times in 10,000 sets of 10 throws, would you expect to no even number? 6

c. Show that the second degree curve fitting the following data is given by 8  
 $v = 3 + 0.85u - 0.27u^2$  where  $u = x - 5$ ,  $v = y - 7$ . Also find  $y$  when  $x = 10$ .

X	1	2	3	4	5	6	7	8	9
y	2	6	7	8	10	11	11	10	9

Q.3 a. A fair coin is tossed till a head appears. What is the expectation of the number of tosses required? 6

b. Given a normal distribution with  $\mu = 50$ ,  $\sigma = 10$  Find the value of  $x$  that has  
(a) 13 % of area to the left (ii) 14 % of the area to the right. 6

c. Solve by using Simplex method. 8

$$\text{Maximise } z = 5x_1 + 4x_2$$

$$\text{subject to, } 6x_1 + 4x_2 \leq 24$$

$$x_1 + 2x_2 \leq 6$$

$$-x_1 + x_2 \leq 1$$

$$x_2 \leq 2$$

$$x_1, x_2 \geq 0$$

Q.4 a. Derive the pdf of Poisson's distribution as a limiting case of Binomial distribution and hence find its mean. 6

b. Calculate the Spearman's rank correlation for the following data, 6

x	97.8	99.2	98.8	98.3	98.4	96.7	97.1
y	73.2	85.8	78.9	75.8	77.2	81.2	83.8

c. Evaluate  $\int_0^6 \frac{dx}{1+x^2}$  by using, 8

(i) Trapezoidal rule (ii) Simpson's  $\frac{1}{3}$ rd rule, (iii) Simpson's  $\frac{3}{8}$ th rule

Q.5 a. For a random sample of 10 children fed on diet 'A' the increase in weights was 10,6,16,17,13,12,8,14,15,9. For a random sample of 12 children fed on diet 'B' the increase in weights was 7,13,22,15,12,14,18,8,21,23,10,17. Test whether the diets 'A' & 'B' differ significantly as regard effect in increase in weight. Use 5% LOC. 6

b. From the following data find the equation of line of regression of  $y$  on  $x$  and estimate the most probable value of  $y$  when  $x = 80$ . 6

x	89	86	74	65	64	64	66	67	72	79
y	92	91	84	75	73	72	71	75	78	84

c. While calculating correlation coefficient between  $x$  &  $y$  following constants are obtained.  $N = 25$ ,  $\sum x = 125$ ,  $\sum y = 100$ ,  $\sum x^2 = 650$ ,  $\sum y^2 = 460$ ,  $\sum xy = 508$  8

It was later discovered that it had recorded two pairs  $x = 6$ ,  $y = 14$  and  $x = 8$ ,  $y = 6$  while the correct values were  $x = 8$ ,  $y = 12$  and  $x = 6$ ,  $y = 8$ . Calculate correct correlation coefficient.

Q.6 a. Solve the following by Gauss elimination method. 6

$$2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16$$

b. The following table gives the information regarding the colour of hair and colour of eye. 6

Hair colour → Colour of eye ↓	black	fair	brown	total
Brown	10	22	32	64
Blue	15	28	29	72
grey	25	20	19	64
total	50	70	80	200

use  $\chi^2$ -test to determine whether there is any association between hair colour and eye colour.

c. Apply Lagrange's formula to find  $f(5)$  &  $f(6)$  given that 8

$f(1) = 2, f(2) = 4, f(3) = 8, f(7) = 128$ . Explain why the result differs obtained by  $f(x) = 2^x$ .

Q.7 a. Solve Graphically the following L.P.P. 6

Maximize,  $z = x - 2y$

$$-x + y \leq 1$$

subject to,  $6x + 4y \geq 24$

$$0 \leq x \leq 5, 2 \leq y \leq 4$$

b. Explain : 6

(i) Null hypothesis (ii) Alternate hypothesis (iii) Critical region

(iv) Level of significance (v) types of errors (vi) one tailed two tailed tests

c. Fit the Binomial distribution for the following data and test the goodness of fit. 8

No. of boys	0	1	2	3	4	5
No. of families	8	40	88	110	56	18

SE/IT/IV (REM) 21/5/2012

Microprocessors & microcontrollers

7: 1st half.12-AM(x)

Con. 3794-12.

GN-5633

(3 Hours)

[ Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions out of **remaining**.  
(3) **Figures** to the **right** indicate **full marks**.

1. Design 8086 based system to interface — 20
  - (a) 64 KB RAM using 62256 chips
  - (b) 128 KB EPROM using 27256 chips.
  
2. (a) Explain the software and hardware interrupts of 8051. 10  
(b) Explain TIMER / COUNTERS of IC 8051. 10
  
3. (a) Interface ADC 0808 with 8051 and write the embedded C program for the same. 12  
(b) 8086 is running at the frequency of 5 MHz. Write an ALP to generate a square wave of 1 kHz and also show the delay calculations. 8
  
4. (a) Interface 8051 with 8255 PPI. Explain the interfacing diagram and hence explain the port structure of 8051. 10  
(b) Explain various addressing modes of 8051 with example. 10
  
5. (a) What is sequenced memory and what are its advantages ? Explain logical and physical address in 8086. 10  
(b) Explain mixed language programming. 10
  
6. (a) Explain the register file structure of stack of PIC Microcontroller. 10  
(b) Explain following instructions of 8086 — 10
  - (i) INTO
  - (ii) CMP
  - (iii) STOS
  - (iv) MOV
  - (v) ADC
  
7. Write short notes on any **three** of the following :— 20
  - (a) Harvard architecture and Pipelining
  - (b) Clock generator IC 8284
  - (c) Serial communication of 8051
  - (d) Minimum mode of 8086.

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions from remaining **seven** questions.

Q.1.

- a) Explain how servlet deals HTTP Get and Post request with an example program. 10  
 b) Explain i) URL ii) Cookies 10

Q.2

- a) Explain working of RSS. Also explain use of XML other than creating a web page. 10  
 b) Explain CSS with an example. 10

Q.3

- a) Write a HTML program for the registration of new customer to the online banking system.(customer data collected using a Form, after submitting account number, type of account and user name, ask for password is displayed as output). 10  
 b) Differentiate between i)HTTP1.0 and HTTP 1.1 ii) GET and POST method, 10

Q.4

- a) What is difference between web site and Web Service and hence also explain characteristic of web, 2.0 (10)  
 b) Explain in detail about session tracking with an example , (10)

Q.5

- a) Explain JDBC API and JDBC drivers in detail. (10)  
 b) Explain different ASP objects. (10)

Q.6

- a) Explain following Architecture in detail:  
 i) SOA ii) three tier (10)  
 b) Explain working of DNS (5)  
 c) What do you understand by RIA . (5)

Q.7 Write short note on ; (20)

1) E-commerce

2) JSP

SC. sem. IV - IT

30/5/12

# Principles of communication Engg.

GN-8453 1

Con. 4487-12.

GN-8453

(3 Hours)

[ Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions from remaining **six** question.  
(3) Assume suitable data if **necessary**.  
(4) **Figures** to the **right** indicate **full marks**.
1. (a) What is effect of Gaussian noise on digital communication ? 5  
(b) A 4 kHz bandlimited signal is sampled at Nyquist rate and quantized to 4 levels, 5  
Q. 1, Q. 2, Q. 3 and Q. 4. The respective probabilities are  $P_1 = P_2 = 1/8$  and  $P_3 = P_4 = 3/8$ .  
Find the rate of information.  
(c) Prove time convolution property of Fourier transform. 5  
(d) Explain Electronic Communication System with block diagram. 5
  2. (a) Draw circuit diagram of Foster Seeley discriminator and explain its working with phasor diagrams. 10  
(b) Explain overload and hunting error in Delta Modulation. Find the condition to avoid slope overload error. 10
  3. (a) Draw the circuit diagram for ring modulator for generating DSB-SC AM signal and explain its working. 10  
(b) Explain working of envelope detector. An audio signal of bandwidth 5 kHz is modulated on carrier frequency 1 MHz using conventional AM. Determine range of values of RC for successful demodulation of this signal using an envelop detector. 10
  4. (a) What is multiplexing in communication systems ? Draw the block diagram of frequency division multiplexing to transmit five signals. 10  
(b) A carries  $C(t) = A \cos 2\pi 10^6 t$  is angle modulated (PM or FM) by a sinusoid signal  $m(t) = 2 \cos 2000 \pi t$ . The deviation constants are  $k_p = 1.5 \text{ rad/V}$  and  $K_f = 3000 \text{ Hz/V}$ .  
(i) Determine modulation index in each case 10  
(ii) Determine the bandwidth in each case using Carson's rule  
(iii) If amplitude of  $m(t)$  is decreased by a factor of two how would bandwidth change.
  5. (a) Explain the concept of image frequency and its rejection. Discuss double spotting. 10  
(b) Prove sampling theorem for low pass signals. What is use of anti aliasing filter. 8+2
  6. (a) Draw the ASK, PSK and FSK waveforms for digital data 10100110. 10  
(b) What is need of pre-emphasis and De-emphasis in FM ? Explain the standards used for the same with circuits. 10
  7. (a) Define Noise factor and Noise temperature. 5  
(b) Compare TDM and FDM. 5  
(c) Explain Friss Transmission formula. 5  
(d) Discuss Third Method of SSB generation. 5

(3 Hours)

[ Total Marks : 100

**N.B. (1) Question No. 1 is compulsory.**(2) Attempt any **four** questions out of remaining **six** questions.(3) **All** questions carry **equal** marks.(4) Assume **suitable data** wherever **required**.

1. (a) (i) Explain the impact of technological innovation on society. 10  
(ii) State the importance of Balance Sheet.
- (b) Explain the following in brief :— 10  
(i) Creative Accounting  
(ii) Double Entry Book Keeping System.
2. (a) Explain the three critical trajectories impacting the innovation process. 10  
(b) On 1<sup>st</sup> January, 1993 the cost of Plant and Machinery of Nagpur Transport Company Ltd. was Rs. 7,50,000 and the total Depreciation in respect thereof was Rs. 2,50,000. This includes one Rickshaw purchased for Rs. 30,000 on which depreciation provided to date was Rs. 9,000. On August, 1993, this Rickshaw was badly damaged in an accident and was sold for Rs. 3,000. A sum of Rs. 25,000 was recovered from the insurance company on 3<sup>rd</sup> October, 1993. On 31<sup>st</sup> December, 1993 Rs. 25,000 was provided for depreciation on Plant and Machinery. Prepare Plant and Machinery Account in the books of company for the year 1993. 10
3. (a) Explain the following :— 10  
(i) Creation (iv) Intellectual property  
(ii) Innovation (v) Entrepreneur.  
(iii) Wealth creation
- (b) Explain Debit Note and Credit Note. 10
4. (a) Define and explain the features of Profit and Loss Account, Balance Sheet and Cash Flow Statement. 10  
(b) Calculate cash flow from operating activities from the following information :— 10  
Cash received from customers : 4,00,000  
Cash paid to supplier : 2,50,000  
Operating expenses : 1,00,000  
Income Tax : 10,000.
5. (a) Explain Always Better Control (ABC) and Economic Ordering Quantity (EOQ) techniques of Inventory Control/Management. 10  
(b) Explain Annual Reports and International Accounting. 10
6. (a) Explain the S-curve model in Technology Improvement and state its limitations. 10  
(b) What are the factors that will influence innovation in an organisation ? 10
7. Write short notes on (any two) :— 20  
(a) Depreciation Methods (c) Technology and National Economy  
(b) Budgetary Control (d) Ledger, T-account and Financial Analysis.



4/6/2012

SEM-IV (R) - IT, May 2012 -  
Networking techniques for digital devices.

Con. 4663-12.

(REVISED COURSE)  
(3 Hours)

GN-8993

[Total Marks : 100

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

(2) Attempt any four questions from remaining six questions.

- 1 a) Explain various transparency that you need to achieved in Distributed system (10)  
b) Explain working of following Internetworking Devices in Campus Area Network (10)
  - 1) Layer 2 Switch
  - 2) Layer 3 Switch
- 2 a) Explain IP v 4 header. Also discuss need for Fragmentation of IP packet. (10)  
b) What is CORBA? Explain its architecture and various services provided by it. (10)
- 3 a) Explain Following with example: (10)
  - 1) IP address
  - 2) Port no.
  - 3) URL
  - 4) MAC address
  - 5) Socket  
b) State at least three major differences between RIP and OSPF, also explain various problem in RIP (10)
- 4 a) Explain ALHO , slotted ALOHA and CSMA/CD (15)  
b) Explain working of RPC (5)
- 5 a) Explain working of DNS, Type of DNS entry, Need for Reverse lookup entry , Also give example of URL and map it with DNS hierarchy (10)  
b) Explain need of subnet mask, with example of subnetting class C ip address (10)
- 6 a) Explain Sliding window protocol at Transport layer (10)  
b) Explain TCP connection establishment mechanism (5)  
b) Describe purpose of various TCP timers (5)
- 7 Write short notes on (20)
  - 1) Network Management
  - 2) M/M/1 Queue
  - 3) Network topology
  - 4) Multicasting