SE | IT | IV (Rev.) 26/11/12
C. Maths

10 : 2nd half.12-AM(h)

Con. 7905-12. **KR-7061**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory.**
(2) Answer any **four** questions from remaining **six** questions.
(3) **Statistical tables** will be provided on **request.**

1. (a) A sample of 100 students is taken from a large population the mean heights of students in this sample is 160 cm. Can it be reasonably regarded that in the population the mean height is 165 cm. and standard deviation is 10 cm. (Given : Z_{tab} = 1·96 (5% 2 tailed) **5**

(b) Find all basic solution of following problem — **5**

Maximise $Z = x_1 + 3x_2 + 3x_3$

Subject to $x_1 + 2x_2 + 3x_3 = 4$

$2x_1 + 3x_2 + 5x_3 = 7$

$x_1, x_2, x_3 \geq 0.$

Also find the basic feasible, non degenerate, infeasible basic, optimal basic feasible solution.

(c) The first four moments of a frequency distribution about the value 4 are –1·5, 17, –30 and 108. Calculate the moments about the mean. **5**

(d) If f(1) = 2, f(2) = 4, f(3) = 8, f(4) = 16, f(7) = 129. Find f(5) using Lagrange's interpolation formula. **5**

2. (a) A pair of fair dice is rolled once. Let X be the random variable whose value for any outcome is the sum of two numbers on dice. **6**
   (i) Find the probability function for X and construct the probability table.
   (ii) Find the probability that X is an odd number.
   (iii) Find the probability that X lies between 3 and 9.

(b) Using bisection method, find a possitive root of $xe^x = 1$ lying between 0 and 1. Solve upto two decimal places. **6**

(c) Fit second degree parabolic curve to the following data — **8**

x	1	2	3	4	5	6	7	8
y	2	6	7	8	10	11	11	10

3. (a) Samples of two types of electric bulbs were tested for length of life and following data were obtained — 6

	No. of Sample	Mean of Sample	Standard deviation
Sample 1	8	1134 hrs	36 hrs.
Sample 2	7	1024 hrs	40 hrs

Test at 5% level of significance whether the difference in the sample means is significant. (Table value of t for 13 d.f. is 2·16, for 14 d.f. is 2·15 and for 15 d.f. is 2·13.)

(b) Find mean and variance of Binomial distribution. 6

(c) (i) Using forward difference formula find y when x = 0·5 from the following data :— 6

x	0	1	2	3
y	−1	1	1	−2

(ii) Show that $\Delta \log f(x) = \log\left[1+\frac{\Delta f(x)}{f(x)}\right]$ 2

4. (a) Apply Guass-Seidel iteration method to solve the equations $20x + y - 2z = 17$; $3x + 20y - z = -18$; $2x - 3y + 20z = 25$ 6

(b) A skilled typist on routine work kept a record of mistakes made per day during 300 working days. If she made 1 mistake on 143 days, 2 mistakes on 110 days. Find the number of days on which she made 3 mistakes using Poisson distribution. 6

(c) The following table shows the height of a sample of 12 fathers and their sons. Find rank correlation coefficients 6

x	65	63	67	64	68	62	70	66	68	67	69	71
y	68	66	68	65	69	66	68	65	71	67	68	80

5. (a) The PDF of random variable X is given by 6

$f(x) = kx^2(2-x)$ $0 \le x \le 2$

$= 0$ otherwise

Find : (i) k (ii) Mean (iii) Variance

(b) Fitting of binomial distribution for the following data and testing goodness of fit :— 6

x	0	1	2	3	4	5	6
f	5	18	28	12	7	6	4

(Given : $\chi^2_{tab} = 5{\cdot}991 (v = 2, 5\%$ L.O.S.))

(c) Evaluate $\int_0^1 \frac{dx}{1+x}$ by using 8

(i) Trapezoidal rule

(ii) Simpson's $\left(\frac{1}{3}\right)$rd rule

(iii) Simpson's $\left(\frac{3}{8}\right)$th rule

Take h = 0·25. Compare the results with exact value.

6. (a) Find the real root of $x^3 - 2x + 5 = 0$ correct to three decimal places using Newton Raphson Method. 6

(b) A factory turns out an article by mass production method from past experience it appears that 20 articles on an average are rejected out of every batch of 100. Find variance of the number of rejected articles. What is the probability that the number of rejects in a batch exceed 30 ? 6

(Given : Area (z = 0 to z = 2·5) = 0·4938)

(c) The following marks have been obtained by a class of students in stats (out of 100) : 8

Paper I	45	55	56	58	60	65	68	70	75	80	**85**
Paper II	56	50	48	60	62	64	65	70	74	82	**90**

Compute the coefficient of correlation for the above data. Find also the equations of lines of regression.

7. (a) For a poission distribution P(x = 2) = 9P (x = 4) + 90P (x = 6), then find mean and variance of distribution. 6

(b) The following data is collected on two characters. Based on this, can you say that there is no relation between smoking and Literacy :— 6

	Smokers	**Non-smoker**
Literates	83	57
Illiterates	45	68

(Given : $\chi^2_{fab} = 3{\cdot}841\,(\upsilon = 1, 5\%\ \text{L.O.S.})$)

(c) Using Simplex Method, solve the following L. P. P. 8

Maximise $Z = 3000x_1 + 2500x_2$

Subject to $2x_1 + x_2 \leq 40$

$x_1 + 3x_2 \leq 45$

$x_1 \leq 12$

$x_1, x_2 \geq 0.$

Sem IV IT 01|12|12

Microprocessor & Microcontroller

61 : 2nd half-12-(f) JP

Con. 7869-12. **KR–7178**

(3 Hours) **[Total Marks : 100**

N.B.: (1) Question No. **1** is **compulsory**.
(2) Solve any **four** out of the remaining **six** questions.
(3) Draw neat **diagrams** wherever **required**.

1. Design an 8086 based system to interface :— **20**
   (a) 64 KB RAM using 62256 chips
   (b) 64 KB EPROM using 27256 chips
   (c) 2 16-bit input and output ports in handshake mode.

   For the above specifications :—
   (i) Draw the memory map and input-output map
   (ii) Draw the necessary interfacing diagram
   (iii) Explain the concept of using absolute decoding
   (iv) Draw the interfacing diagram and explain the same.

2. (a) Explain the Timer/Counters of IC 8051. **10**
   (b) Interface 8051 with 8255 PPI. Explain its interfacing diagram and hence explain the port structure of 8051. **10**

3. (a) Explain the addressing modes of 8086 with examples. **10**
   (b) Explain the following instructions of 8086 – **10**
   INTO, CMP, STOS, MOV, ADC.

4. (a) Explain how parameters are passed to a procedure. Also write an 8086 based assembly language program to generate a delay of 100 M secs. Assume system frequency to be 10 MHz. **10**
   (b) Draw the schematic of maximum mode of operation of 8086 and hence compare minimum and maximum mode of 8086. **10**

5. (a) Write an assembly language program for 8051 micro-controller to generate a square wave of 2 KHz on pin 1·0 assuming crystal frequency of 12 MHz. Justify the mode of operation. **10**
   (b) Explain what is meant by segmented memory. State its advantages and disadvantages (if any) and hence explain the logical and physical address in 8086 with example. **10**

6. (a) Explain the hardware and software interrupts of 8051 micro-controller. **10**
   (b) Explain the register set of 8086. Also explain the flags of 8086 in detail. **10**

7. Write short notes on :— **20**
   (a) Watchdog timer of PIC
   (b) Serial communication of 8051
   (c) Assembles directives
   (d) Jump instructions of 8051 μC.

7/12/12

S.E. I.T. sem IV (Rev) Dec-12

Sub - I.P.

D : scan Oct.12 366
Con. 7820-12.

KR-7289

(3 Hours) [Total Marks : 100

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

1. Differentiate between :– 20
   (i) HTML 1·1 and HTTP 1·0
   (ii) Web Site and Web Services
   (iii) XML and HTML
   (iv) SET and SSL.

2. (a) Explain how you could use HTML frames to provide a Web Site that includes an advertisement for your company along with the content from any other Web Page. Show that HTML you would need to do this, as you that for your example the "Other Webpage" is w.w.w.google.com. Make sure that you explain how this work. 10
   (b) What is URL ? Explain working of DNS. 10

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 and type of account. – Entering User Name and password form is displayed as output). 10
   (b) Explain Servlet Life Cycle in detail. 10

4. (a) Write a DHTML program to handle any three mouse events. 10
   (b) Explain how servlet deals HTTP Get and Post request with an example program. 10

5. (a) What do you mean by Sessim Management ? Explain various ways of Sessim Management. 10
   (b) Explain Built in objects in ASP. 10

6. (a) What is CSS and what do you understand by the term 'Cascading' ? Explain with an example. 10
   (b) Explain three tier-architecture with advantages, disadvantages and applications. 10

7. (a) Describe the operations of retrieval of a Webpage with its associated messages using HTTP. 10
   (b) Write short notes on :– 10
      (i) JDBC
      (ii) DHTML

BE | IT | IV (R·) 12/02/12
PCE

20 : 2nd half-12-(f) JP

Con. 7814-12. **KR–7409**

(3 Hours) **[Total Marks : 100**

N.B.: (1) Question No. **1** is **compulsory**.
(2) Solve any **three** from the **remaining**.
(4) Assume **suitable** data whereever **required**.
(3) Illustrate your answers with **neat** diagrams.

1. (a) Find Fourier transform of unit impulse signal $\delta(t)$. **5**
   (b) Draw and explain the basic block diagram of Communication system. **5**
   (c) Explain A-law and μ-law companding. **5**
   (d) Compare Frequency modulation and Phase modulation. **5**

2. (a) Define Amplitude Modulation. Derive the equation of AM wave. Draw envelope of AM for $m < 1$, $m = 1$ and $m > 1$. **10**
   (b) A 400 W carrier is modulated to depth of 75% . Calculate total power in following forms of AM : **10**
   (i) DSB – FC
   (ii) DSB – SC
   (iii) SSB – FC
   (iv) SSB – SC.

3. (a) Explain working of Foster Seely discriminator with phasor diagram. **10**
   (b) In an FM system, when the Audio Frequency (AF) is 500 Hz and the AF voltage is 2·4 V, the deviation is 4·8 kHz. If the AF, voltage is now increased to 7·2 V, what is new deviation ? If the AF voltage is raised to 10V while the AF is dropped to 200 Hz, what is new deviation ? Find modulation index in each case. **10**

4. (a) Explain the sideband generation in SSB using phase shift method. **10**
   (b) Explain satellite communication system. List applications in various fields. **10**

5. (a) Draw and explain block diagram of four channel FDM system. **10**
   (b) Explain double conversion superhetrodyne receiver with neat block diagram. **10**

6. (a) Explain the terms sensitivity, image frequency, double spotting, automatic gain control and three point tracking in radio receivers. **10**
   (b) How adaptive DM is improvement of linear DM ? Draw block diagram of adaptive DM and explain its working. **10**

7. (a) State sampling theorem for low pass signals. What in Nyquist rate ? **5**
   (b) Explain working of balanced modulator. **5**
   (c) Define Noise temperature and Noise Bandwidth. **5**
   (d) Find Fourier transform of $x(t) = e^{-at}$, $t \geq 0$. **5**

SE(IT) Sem – IV
Networking Technologies for Digital Devices. : 17/12/12

55 : 2nd half-12-(f) JP

Con. 7839-12.

KR–7517

(3 Hours) [Total Marks : 100

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

1. (a) A pure ALOHA network transmits 200 bit frames on a shared channel of 200 kbps. What is the throughtput if the system (all stations together) produces ? **10**
   (i) 1000 frames per second
   (ii) 500 frames per second
   (iii) 250 frames per second.
   (b) Explain the life cycle of CORBA. **10**

2. (a) What is routing in network ? Write the difference between adaptive and non-adaptive routing. Write any one algorithm of adaptive routing. **10**
   (b) What is RPC ? How RPC is implemented ? How are the stubs generated ? **10**

3. (a) A company is granted the site address 201·70·64·0. The company needs six subnets. Design the subnets. **10**
   (b) The following is a dump of TCP header in hexadecimal format **10**

   05320017 00000001 00000000 500207FF 00000000

   (i) What is the source port number ?
   (ii) What is the sequence number ?
   (iii) What is the acknowledgement number ?
   (iv) What is the length of header ?
   (v) What is the window size ?

4. (a) Calculate the maximum bit rate for a channel having bandwidth 1600 Hz. If : **10**
   (i) S / N ratio 0 dB
   (ii) S / N ratio is 20 dB.
   (b) Differentiate between :— **10**
   (i) Star topology and Bus topology
   (ii) Circuit switching and Message switching.

5. (a) Explain the network performance major metrics. **10**
   (b) Explain hubs, gateways and bridges. **10**

6. (a) Explain IPV_4 datagram format. **10**
   (b) What is multiplexing ? Explain different types of multiplexing. **10**

7. Write short notes on :— **20**
   (a) SNMP
   (b) QPSK
   (c) DNS
   (d) CSMA / CD.

S.E. IT. sem IV (Rev) Dec-2012

Sub:- FAMTI

49-p3-d-apq-SH KL12 B

Con. 7877–12.

KR–7631

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from question Nos. **2** to **7**.
(3) **All** questions carry **equal** marks.

1. (a) Define the following :— **10**
   (i) Innovation
   (ii) Invention
   (iii) Innovation strategy
   (iv) Intellectual property
   (v) Entrepreneur.
   (b) Explain the s-curve model in technology improvement and state its limitations. **10**

2. (a) Define and explain the features of Profit and Loss account, Balance Sheet and Cash flow statement. **10**
   (b) Explain debit note and credit note. **10**

3. (a) Define depreciation and give the various methods of depreciation. **10**
   (b) Mr. Alex purchased machinery on 1st April, 2009 for 1,50,000 ₹ He purchased further machinery on 1st October, 2009 costing ₹ 1,00,000 and on 1st July 2010 costing ₹ 50,000. **10**
   On 1st January 2012, one third of the machinery purchased on 1st April, 2009 became obsolete and was sold for ₹ 15,000. Show machinery account assuming that the financial year ending is 31st March every year. The rate of depreciation to be charged @ 10% p.a. straight line method.

4. (a) Explain the following :— **10**
   (i) Assets
   (ii) Creative Accounts
   (iii) Opening and Closing Balance
   (iv) Ledger
   (v) Double Entry Book Keeping.
   (b) Explain the role of technology in wealth creation process. **10**

[TURN OVER

5. (a) Explain the ABC (Always Better Control) and EOQ (Economic Ordering Quantity) techniques of Inventory Management. **10**

(b) Friends Enterprise manufactures a special product 'ZED'. The following particulars are collected for the year 2008. **10**

(i) Monthly demand of zed : 1000 units
(ii) Costing of placing an order : ₹ 100
(iii) Annual carrying cost per unit : ₹ 15
(iv) Normal usage : 50 units per week
(v) Minimum usage : 25 units per week
(vi) Maximum usage : 75 units per week
(vii) Re-order period : 4 to 6 week

Compute from the above :—

(i) Re-order quantity
(ii) Re-order level
(iii) Maximum level
(iv) Minimum level
(v) Average stock level..

6. (a) Explain different types of voucher with suitable examples. **10**

(b) What are the effects of technology in growth and development of business organization ? **10**

7. Write a short notes on :— **20**

(a) Kondratleff "Long waves in Economic Life"
(b) Partnership and Limited Companies
(c) Fianancial Accounting and Management Accounting
(d) Budgetory Control.
