SE IT IV 2/12/11
Computational Mathematics

Con. 6051–11. **MP–4423**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining questions.
(3) **Figures** to the **right** indicates **full** marks.
(4) Use of **statistical** table is **permitted**.

1. (a) Find the root of $4x - e^3 = 0$ that lies between 2 and 3 using Newton-Raphson method. **5**

(b) The P.D.F. of a random varible x is given by :– **5**

x	0	1	2	3	4	5	6
P(x)	k	3k	5k	7k	9k	11k	13k

Find :– (i) K, (ii) $P(x < 4)$, (iii) $P(3 < x \leq 6)$.

(c) If the variance of the Poisson distribution is 3. Find the probability that – (i) $P(x = 2)$ (ii) $P(x \geq 4)$. **5**

(d) The lifetime 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 thm. find the probability that the average lifetime of 60 bulbs exceeds 1250 hrs. **5**

2. (a) Fit a straight line to the following data :– **6**

x	1	2	3	4	5	6
y	49	54	60	73	80	86

(b) A drug was administered to 5 persons and the systolic blood pressure before and after was measured. The results are given below :– **7**

Candidates	I	II	III	IV	V
B.P. before	140	130	132	150	150
B.P. after	132	126	133	144	123

Test whether the drug is effective in lowering the systolic blood pressure at 5% level of significance.

(c) Solve the following system of equations by Gauss Seidal method – **7**

$$28x + 4y - z = 32$$
$$x + 3y + 10z = 24$$
$$2x + 17y + 4z = 35$$

3. (a) Evaluate : $\int_0^1 \frac{dx}{1+x^2}$ using trapezoidal rule with h = 0·2. Can we use other formulae of numerical integration in this case ? **6**

(c) A random variable x has a following P.D.F. **7**

x : –2 3 7

f(x) : $\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{6}$.

Find M.C.F. and hence find first four central moments.

(c) In a normal distribution 7% of the items are under 35 and 89% are under 63. Find its mean and standard deviation. **7**

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Computational. Mathematics

4. (a) Determine all basic solutions to the following problem :– **6**

Maximise : $z = x_1 - 2x_2 + 4x_3$

Subject to : $x_1 + 2x_2 + 3x_3 = 7$

$3x_1 + 4x_2 + 6x_3 = 15$

(b) The following data gave the growth of employment in lakhs in organised sector in India between 1988 and 1995 :– **7**

Year	1988	1989	1990	1991	1992	1993	1994	1995
Public Sector	98	101	104	107	113	120	125	128
Private Sector	65	65	67	68	68	69	68	68

Find the correlation coefficient between the employment in public sectors and private sectors and give your comments.

(c) (i) Prove that $\Delta = \frac{1}{2}\delta^2 + \delta\sqrt{1+\delta^2/4}$. **4**

(ii) Express f(x) into factorial polynomial where $f(x) = x^3 - 3x^2 - 2x + 5$. **3**

5. (a) Use Lagrange's formula to fit a polynomial to the data and hence find y at x = 1. **6**

x	–1	0	2	3
y	–8	3	1	12

(b) Based on the following data determine if there is a relation between literacy and smoking :– **7**

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

(c) Find the mean and variance of Binomial distribution. **7**

6. (a) The men breaking strength of cables supplied by a manufacturer is 1800 with standard deviation 100. By a new technique in the manufacturing process it is claimed that the breaking strength of the cables has increase. In order to test the claim a sample of 50 cables is tested. It is found that the mean breaking strength is 1850. Can we support the claim at 1% level of significance ? **6**

(b) Two Judges in a beauty contest gave the following marks out of 50 to 9 contestants :– **7**

Judge A	20	25	22	27	23	26	34	24	32
Judge B	30	42	45	46	33	34	40	35	39

Do the two Judges appear to agree in their standards ? When will agreement complete ?

(c) Find a root of $x^3 - x - 4 = 0$ using Bisection method in four stages. **7**

7. (a) Using backward difference formula, find t, when p = 84 from the following data :– 6

p :	60	70	80	90
t :	226	250	276	304

(b) Using Simplex method solve the following L.P.P. :– 7

Maximize : $z = 3x_1 + 2x_2$

Subject to : $x_1 + x_2 \leq 4$

$x_1 - x_2 \leq 2$

$x_1, x_2 \geq 0.$

(c) Fit a Poisson distribution to the following data and test the goodness of fit :– 7

x	0	1	2	3	4	5
f	142	156	69	27	5	1

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8/12/2011 SE IT IV (Rev) MPMC

210 : 2ndHf11C.mk

Con. 6293-11. **MP-4414**

(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) Assume **suitable** data if **necessary** and state the assumptions **clearly.**
(4) **Figures** to the **right** indicate **full** marks.

1. Design a 8086 based system with the following specifications :— **20**
   (a) 8086 processor working at 8 MHz
   (b) 64 KB RAM using 62256 chips
   (c) 64 KB EPROM using 27256 chips
   (d) Two 16-bit input and output ports in handshake mode.

   Draw for the above specifications :—
   (i) Memory map and I/O map
   (ii) The necessary interfacing diagram
   (iii) Explain the concept of using absolute decoding
   (iv) Explain the design.

2. (a) 8086 microprocessor is running at a frequency of 5 MHz. Write an 8086 assembly Langauge Program to generate a square wave of 1 KHz at one of the bit of output port. Explain the logic of the program also via flow chart and also show the delay calculations. **10**
   (b) Explain the hardware and software interrupts of 8051 microcontroller in detail. **10**

3. (a) Explain the various parameter passing techniques to a procedure with examples. **10**
   (b) Explain the logic behind generating a 100 msec delay, assuming the system frequency to be 10 MHz and hence write a program (assembly language) for the same. **10**

4. (a) Explain the TIMER/COUNTERS of IC 8051. **10**
   (b) Interface 8051 and 8255 PPI. Explain the interfacing diagram and hence explain the port structure of 8051. **10**

5. (a) Write an Assembly Language program to generate a sine wave and hence interface an 8 bit DAC with 8051 microcontroller and explain the same. **10**
   (b) State and explain the various addressing modes in 8051 with examples and compare the same with the addressing modes of 8086. **10**

6. (a) Explain jump and CALL instruction of 8051 microcontroller with examples. Also explain the difference between intersegment and intrasegment calls with examples. **10**
   (b) Differentiate between Procedure and Macros. Write and explain an 8086 program to reverse the user entered string using macros. **10**

7. Write short notes on any **four** :— **20**
   (a) Minimum and maximum mode of 8086
   (b) Assembles directives
   (c) Logical and physical address of 8086 with example
   (d) Serial communication of 8051
   (e) 8051 register banks.

✓ 13/12/11 SE IT Sem - IV CBSGS Internet Programming

VT-Sept.-11- 162

Con. 6522–11. **MP–4408**

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

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

1. Write HTML code to design a form Include name, username, password, reconfirm password, clue to remember password. Write validations for inputs wherever necessary. Write ASP code to add input data to database. **20**

2. (a) Explain significance of cascading style sheets. Explain types of CSS with examples. **10**
(b) List and explain all the elements that are available for getting input from the user in HTML. **10**

3. (a) Explain need of frames in web browser with example. **5**
(b) What is document type definition. **5**
(c) Draw the hierarchy of Javascript built in objects. Explain each one briefly. **10**

4. (a) Discuss the event handlers in Javascript. **5**
(b) Explain the anchor tag and its attributes with example. **5**
(c) Create the following table using HTML tags. **10**

Time Table and Fare List

Name of Train	Place	Destination	Time		Fare
			Arrival	Departure	
Rajdhani	Mumbai	Delhi	07·30	08·45	Rs. 989·00
Madras Mail	Mumbai	Madras	09·00	10·15	Rs. 450·00
Konkan Exp.	Mumbai	Manglore	13·30	14·45	RS. 756·00
Deccan Exp.	Mumbai	Pune	16·00	17·30	Rs. 345·00

5. (a) Explain three tier architecture. State its advantages and disadvantages. **10**
(b) Explain the life cycle of servlet and advantages of servlet over ASP. **10**

6. (a) Give the difference between XML and HTML. What are the features of XML elements and attributes ? **10**
(b) What is server side programming ? Explain methods and properties of Request and Response objects in ASP **10**

7. Write short note on (any **two**) :– **20**
(a) Web Services
(b) Session Tracking
(c) JSP.

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SE IT Sem - IV CBSGS
17/12/11
PCE

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Con. 6638–11.

MP–4417

(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**.

1. Attempt any **four** of the following :– **20**
   (a) Explain the need of modulation.
   (b) Find the Fourier transform of the following signal $y(t) = e^{-at}\, u(t) * u(t)$.
   (c) What is double spotting in a radio receiver ?
   (d) Explain Pre-emphasis and De-emphasis in FM.
   (e) What is ASK ? Explain with the help of suitable waveform.

2. (a) Define Noise Factor. A three stage amplifier has the following power gains and noise factor for each stage. **10**

Stage	Power gain	Noise factor
1	10	2
2	20	4
3	30	5

   Calculate the power gain, noise figure and the noise temperature for the entire amplifier assuming matched conditions.

   (b) Draw the block diagram of phase cancellation SSB generation and explain how the carrier and unwanted sidebands are suppressed. What changes are necessary to suppress other sideband ? **10**

3. (a) An FM wave is represented by the following equation **10**

$$V_{FM} = 10 \sin [5 \times 10^8 t + 4 \sin 1250 t]$$

   Find : (i) Carrier and modulating frequencies.
   (ii) Modulation index and maximum deviation.
   (iii) The power dissipated by this FM wave in a 5Ω resistor.
   (iv) Bandwidth of FM using Carson's rule.

   (b) State and prove the sampling theorem for low pass band limited signal. Explain aliasing error. **10**

[TURN OVER

4. (a) A sinusoidal carrier $V_c = 100 \cos (2\pi \times 10^5 t)$ is amplitude modulated by a sinusoidal voltage $V_m = 50 \cos (2\pi \times 10^3 t)$ upto a modulation depth of 50%. Calculate the amplitude and frequency of each sideband and the RMS voltage of the modulated carrier. **6**

   (b) What is peak clipping and diagonal clipping in diode detectors ? **4**

   (c) Draw the block diagram of Armstrong frequency modulation system and explain the functions of mixer and multiplier. In what circumstances can the mixer be dispensed with ? **10**

5. (a) How is adaptive delta modulation better than linear delta modulation ? Draw block diagram of adaptive delta modulation and explain each block in detail. **10**

   (b) In an AM radio receiver the loaded Q of the antenna circuit at the input to the mixer is 100. If the intermediate frequency is 455 KHz, calculate the image frequency and its rejection at 1MHz. **6**

   (c) Explain the following in relation to radio receiver :– **4**

      (i) Selectivity

      (ii) Sensitivity.

6. (a) What is multiplexing in communication systems ? Draw the block diagram of TDM-PCM system and explain each block. **10**

   (b) Draw the circuit diagram of Ratio detector and explain its working. Compare its performance with that of Foster-Seeley discriminator. **10**

7. Write short notes on any **three** of the following :– **20**

   (a) AGC principle in receivers

   (b) Applications of multiplexing in satellite, optical and wireless communications.

   (c) International standards for communication systems and frequency assignments.

   (d) Properties of Fourier transform.

27/12/11 SE IT Sem-IV FAMTI

45 · 2nd half.11-AM(f)

Con. 6919-11. **MP-4420**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) Solve any **four** from remaining **six** questions.
(3) Assume suitable **data** if **required**.

1. (a) Explain the following :— **10**
   (i) Wealth Creation
   (ii) Intellectual property.
   (b) What are different Depreciation Method ? Explain any two. **10**

2. (a) Explain Financial Accounting and Management Accounting. **10**
   (b) Explain S-curve model in technology improvement and state its limitations. **10**

3. (a) Explain three critical trajectories impacting the innovation process. **10**
   (b) Explain Debit Note and Credit Note. **10**

4. (a) Calculate Cash Flow from operating activities from the following information :— **10**

Cash Recived from Customers	8,00,000
Cash paid to Suppliers	5,00,000
Operating Expenses	1,00,000
Income Tax	20,000

   (b) Explain Technology and National Economy. **10**

5. (a) Explain annual Reports and International Accounting. **10**
   (b) Explain innovation as a collaborative effort. **10**

6. (a) Explain the impact of technological innovation on society. **10**
   (b) Explain different types of voucher with suitable example. **10**

[TURN OVER

7. (a) Explain the objectives of inventory management. 6

(b) From the following Trial Balance of Shri Atul Sheth prepare Trading and Profit and Loss A/c for the year ended 31st March, 2010 and a Balance Sheet on that date. 14

Trial Balance as on 31st March, 2010

Particulars	Debit (Rs.)	Credit (Rs.)
Machinery	90,000	
Building	50,000	
Stock (01-04-09)	10,200	
Purchases	80,800	
Wages and Salaries	17,000	
Carriage Outwards	3,000	
Sundry Debtors	50,000	
General expenses	9,100	
Rent	1,700	
Bad Debts	650	
Income Tax	600	
Legal Charges	800	
Atul Sheth's Drawing	18,000	
Cash in hand	24,000	
Cash at bank	18,000	
Atul Sheth's Capital		1,20,200
Sundry Creditors		18,000
Bills Payable		23,000
Returns Outwards		1,800
Interest		3,300
Sales		2,07,550
	3,73,850	**3,73,850**

Adjustments :—

The following adjustments should be taken into consideration :—

(i) Stock on 31st March, 2010 was Rs. 70,000/- valued at cost and market price Rs. 82,000/-.

(ii) Depreciate Machinery at 10% and Building @5%.

(iii) Rent Outstanding Rs. 800/-.

22/12/11 S.E (I.T) sem IV

AGS 2nd Half (n+) 13

Networking Technology for Digital Devices

Con. 6788-11. MP–4412

(3 Hours) [Total Marks : 100

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

Q.1.
(a) What are the goals of a Distributed system? (5)
(b) Explain five function of Datalink layer. (10)
(c) Explain working of Remote procedure call. (5)

Q.2.
(a) What is CORBA? Explain its architecture and various services provided by it. (10)
(b) Explain TCP header.
or
Explain TCP timers. (10)

Q.3.
(a) State at least three major differences between RIP and OSPF, also explain various problem in RIP. (10)
(b) Explain difference between
(1) TCP and UDP.
(2) IPv4 and IPv6. (10)

Q.4.
(a) Explain Following with example:
(1) IP address (2) Port no. (3) URL (4) MAC address (5) Socket. (10)
(b) Explain working of various internetworking devices. (10)

Q.5.
(a) Explain Subnetting and give example of subnetting of class C network (10)
(b) Explain CRC and Checksum. (10)

Q.6.
(a) Explain ALHO , slotted ALOHA and CSMA/CD (15)
(b) Why we need sliding window protocol ? (5)

Q.7.
Write short not on: (20)
(1) DNS
(2) M/M/1 Queue
(3) Circuit switch v/s Packet Switch.