4E2919

Roll No. : _____ Total Printed Pages : 3

4E2919

B. Tech. (Sem. IV) (Main / Back) Examination, June/July - 2013
Computer Science & Information Tech.
4CS5 Software Engineering

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions. Selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.)
Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) What are the steps of system development life cycle (SDLC) ? Describe each step briefly. 2+6=8

(b) Discuss the problems that occur while developing the system and suggest the possible solutions. 8

OR

1 (a) You have heard of people discussing system. What are the system and system analysis ? Explain both. 2+6=8

(b) Write down the short notes on : System specification. 8

UNIT - II

2 (a) Compare waterfall model and spiral model for software development. Which one will you prefer and why ? 4+1+3=8

(b) Explain the prototype model ? Under what circumstances is it beneficial to construct a prototype model ? 5+3=8

OR

2 (a) Describe the software development life cycle (SWDLC). Also explain its different phases.

2+6=8

(b) State advantages and disadvantages of evolutionary process model.

8

UNIT - III

3 (a) Elaborate all requirement analysis principles.

4

(b) What do you understand by data dictionary ? Where and how it is used ?

2+1+1=4

(c) Describe characteristics of a SRS.

4

(d) Describe facilitated application specification technique (FAST).

4

OR

3 (a) Write short note on following : Finite State Machine (FSM).

8

(b) Draw a DFD for a hotel management system. Explain each part briefly.

8

UNIT - IV

4 (a) What is software design ? How will you translate the analysis model into Design model ? Also explain the design principles in brief.

1+4+3=8

(b) (i) Explain modularity in context of software design.

2

(ii) What are the various module types ?

2

(iii) Explain cohesion and coupling in modular design.

4

OR

4 (a) What is quantifying program quality ? With the help of your own Hypothetical example, explain a method of quantifying programming quality. 8

(b) Explain any two architectural styles of software design in brief. 4

(c) Explain procedural design in brief. 4

UNIT - V

5 (a) Explain Object Oriented (OO) concept with an example. 8

(b) Describe the class - responsibility - collaborator (CRC). 8

OR

5 (a) Explain the differences between structural and OO analysis with the help of suitable example. 6

(b) What is UML ? How it is useful in OO modeling ? 2+2=4

(c) Describe the unified approach to OO design. 6

4E2018

Roll No. : _____ Total Printed Pages : 4

4E2018

B. Tech. (Sem. IV) (Old Back) Examination, June/July - 2013
Computer Science
4CS5 Statistics & Probability Theory

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.
Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Normal Distribution Table **2. NIL**

UNIT - I

1 (a) The probability that a teacher will give an unannounced test during any class meeting is 1/5. If a student is absent twice, what is the probability that he will miss atleast one test. 8

(b) Three factories A, B, C does 30%, 50% and 20% production of certain item. Out of their production 8%, 5% and 10% of the items produced are defective respectively. An item is purchased and is found to be defective. Find the probability that it was a product of factory A. 8

OR

1 (a) Determine the mean and variance of the Binomial distribution. 8

(b) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the parameters of the distribution. 8

UNIT - II

2 (a) A random variable X has the following probability distribution :

X	-2	-1	0	1	2	3
P(X)	0.1	k	0.2	2k	0.3	3k

(i) Find k

(ii) Evaluate $P(X \geq 2)$

4+4=8

(b) In a four tosses of a coin, if x be the number of heads, find the expected value of x. Also find the mean and variance.

8

OR

2 (a) The first three moments of a distribution about the value 2 of a variable are 1, 16 and –40. Find the mean and variance. Also find the first three moments about $x = 0$.

8

(b) If the life time of a component has probability density function = $= \lambda e^{-\lambda t}, t > 0$. Compute its mean time to failure and variance.

8

UNIT - III

3 (a) Write a short note on queuing theory.

8

(b) The time spent by a repairman on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they come in and if the arrival of sets is approximately Poisson with an average rate of 10 per 8 hour day, what is the repairman's expected idle time each day ? How many jobs are ahead of the average set just brought in ?

8

OR

3 (a) At a railway station, only one train is handled at a time. The railway yard is sufficient for two trains to wait while other is given signal to leave the station. Trains arrive at the station at an average of 6 per hour and the railway station can handle them on an average of 12 per hour. Assuming Poisson arrivals and exponential service distribution, find the steady state probabilities for the various number of trains in the system. Also find the average waiting time of a new train coming into the yard.

8

(b) A supermarket has two girls running up sales at the counters. If the service time for each customer is exponentially distributed with mean of 4 minutes and if the arrival be Poissonian with mean rate of 10 per hour, then find :

(i) The probability of having to wait for service.

(ii) The expected percentage of idle time for each girl.

(iii) If a customer has to wait, find the expected length of his waiting time.

8

UNIT - IV

4 (a) Write a short note on discrete parameter Markov chain.

8

(b) Two brands A and B of a product have probabilities 30% and 70% respectively at time $t = 0$. If their transition matrix P be $\begin{bmatrix} 0.7 & 0.3 \\ 0.2 & 0.8 \end{bmatrix}$, find their probabilities

(i) after time $t = 1$

(ii) after $t = 2$ and

(iii) Their steady state probabilities.

8

OR

4 (a) Automata car wash facility operates with only one bay. Cars arrive according to Poisson distribution, with a mean of 4 cars per hour, and may wait in the facilities parking lot if the bay is busy. Find the time spent by a car in the system and in the waiting if

(i) the time for washing and cleaning a car is exponential with a mean of 10 minutes.

(ii) the time for washing and cleaning a car is constant and equal to 10 minutes.

Which facility is better ?

8

(b) A Markov chain with three states α, β, γ is defined by the transition matrix

$$\begin{array}{c} \\ \alpha \\ \beta \\ \gamma \end{array} \begin{array}{c} \begin{array}{ccc} \alpha & \beta & \gamma \end{array} \\ \begin{bmatrix} \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{3} & 0 & \frac{2}{3} \\ \frac{1}{6} & \frac{3}{6} & \frac{2}{6} \end{bmatrix} \end{array}$$

Taking the initial state to be

$p_1(0)=1,\ p_2(0)=0,\ p_3(0)=0$

at time $t=2$, determine $p_i(2)$

8

UNIT - V

5 (a) Write a short note on open queuing networks.

8

(b) Calculate the coefficient of correlation between x and y from the following data :

x	1	3	5	7	8	10
y	8	12	15	17	18	20

8

OR

5 (a) Fit a straight line to the following data :

x	1	2	3	4	5
y	2	5	3	8	7

8

(b) The following gives the data of rainfall and discharge in a certain river. Obtain the line of regression of y on x :

Rainfall x	1.5	1.8	2.6	2.9	3.4
Discharge y	33	36	40	46	53

8

4E2918

Roll No. : _____ Total Printed Pages : 4

4E2918

B. Tech. (Sem. IV) (Main / Back) Examination, June/July - 2013
Computer Science & Information Tech.
4CS4 Statistics & Probability Theory

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

*Attempt any **five questions**, selecting **one question** from **each unit**. **All** questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Nil 2. Nil

UNIT – I

1 (a) A random variable x has the probability density

$$f(x)=\begin{cases} 0, & x<0 \\ 2e^{-2x} & x>0 \end{cases}$$

Find the probability for

(i) $1<x<3$

(ii) $x>5$

(iii) The distribution function $F(x)$.

8

(b) A and B throw an ordinary die alternately for a stake of Rs. 11, which is to be won by one who first 6. Find their expectations, if A has the first chance.

8

OR

2 (a) A publisher earns a profit of Rs. 20 on a book, if it is published at the right time, but the profit earned is Rs. 18.00 if the publication is delayed. The profit is further reduced to Rs. 10.00 on each book, if though published in time or not

[Contd...

published in time, if they are defective. If 20% of the books be defective and they are only 70% chances of publishing the book at the right time and in perfect conditions without any defect and 10% chances for not publishing in it right time and 20% chances are there for a book not to be in the perfect condition, What is the publishers expected profit ?

8

(b) A person draws cards one by one from a pack until he draws all the aces. How many cards he may be expected to draw ?

8

UNIT - II

3 (a) Find the distribution function of the random variable X where probability density is given by

$$f(x)=\begin{cases} x & for\ 0<x<1 \\ 2-x & for\ 1\le x<2 \\ o & elsewere \end{cases}$$

8

(b) For the binomial variate prove the recurrence formula is $\mu_{k+1}=pq\left[\frac{d\mu_k}{dp}+nk\mu_{k-1}\right]$ where μ_k is K^{th} order central moment.

8

OR

4 (a) The joint probability mass function of (x,y) is given by $P(X=x,Y=y)=k(2x+3y)$, $X=0,1,2$: $Y=1,2,3$. Find k, marginal probability distribution of X and Y. Also find conditional probability distribution of X for $Y=1$. i.e. $P\left[\frac{X=x}{Y=1}\right]$.

8

(b) If X and Y are independent poisson Random variates, show that the conditional distribution of X given the values of $X+Y=n$ is a binomial distribution.

8

UNIT - III

5 (a) Calculate the coefficient of correlation between x and y from the following data :

x	−10	−5	0	5	0
y	5	9	7	11	13

8

(b) Find the two lines of regression and coefficient of correlation for the data given below.

$n=18$, $\Sigma x=12$, $\Sigma y=18$, $\Sigma x^2=60$, $\Sigma y^2=96$, $\Sigma xy=48$.

8

OR

6 (a) Fit a second degree parabola to the following data taking x as the indendement varible.

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

8

(b) Obtain regression line of x on y for the given data :

x	1	2	3	4	5	6
y	5.0	8.1	10.6	13.1	16.2	20.0

8

UNIT - IV

7 (a) A repairman is to be hired to repair machines which break down at an average rate of 3/h. The break down following the Poissonian Law. Non productive time of a machine is considered to cost Rs. 10/h. Two repairmen have been contacted. One A, charge Rs. 5 per hour and repairs 4 breakdowns machines/hr. while B charges Rs. 7 per hour and repairs 6 such faults/hr. Find which repairman should be hired. (1 day = 8 hour working)

8

(b) A tailor takes 1 day to stich a suit. Customer arrival follow Poission distribution with mean rate of 1 in every two hours. How long a customer will have to wait ?

8

OR

8 (a) Prove that the probability distribution in Poisson queues is given by $P_n(t) = e^{-\lambda t}\frac{(\lambda t)^n}{\underline{n}}$ where t denotes number of arrivals n in a time interval t and λ denotes average rate of arrivals.

8

(b) A supermarket has two girls running up sales at the counters. If the service time for each customer is exponentially distributed with mean of 4 minutes and if the arrival be poissonian with mean rate of 10/hr, then find (i) the probability of having to wait for service, (ii) the expected idle time for each girl.

8

UNIT - V

9 (a) Describe the M/G/1 queueing system analysing the steady state solution.

8

(b) Two brands A and B of a product have probabiliteis 30% and 70% respectively at time $t=0$, if their transition matrix be $\begin{bmatrix} .7 & .3 \\ .2 & .8 \end{bmatrix}$, find their probabilities.

(i) after $t=1$

(ii) after $t=2$

(iii) their steady state probabilities.

8

OR

10 (a) Find the nature of the states of the Markox chain with t.p.m.

$$\begin{array}{c} \\ 0 \\ 1 \\ 2 \end{array}\begin{array}{c} \begin{array}{ccc} 0 & 1 & 2 \end{array} \\ \begin{pmatrix} 0 & 1 & 0 \\ \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 1 & 0 \end{pmatrix} \end{array}$$

8

(b) On a telephone booth, arrivals of customers follow the Poisson process with an average time of 10 minutes between one arrival and next arrival. The length of a phone call is assumed to be distributed exponentially with mean 3 minutes. Find (i) the average number of persons waiting in the system. (ii) the probability that a customer spends more than 10 minutes in the both.

8

4E2024

Roll No. : _____ Total Printed Pages : 4

4E2024

B. Tech. (Sem. IV) (Re-Back) Examination, June/July - 2013
Information Technology
4IT2(O) Information Theory and Coding

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

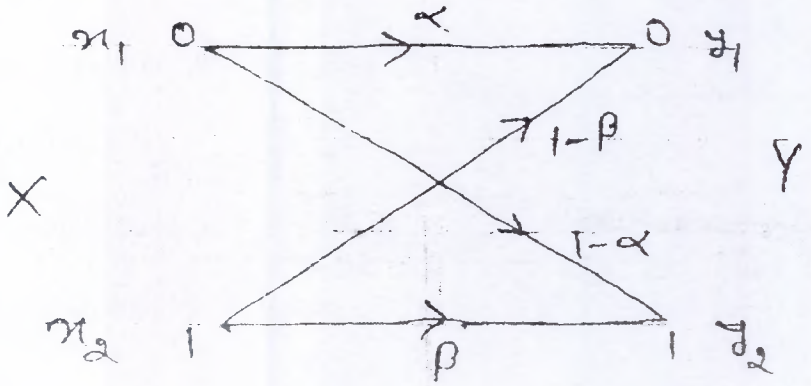
UNIT - I

1 (a) Define entropy. Prove that the entropy for a discrete source is maximum when output symbol are equiprobable. 8

(b) Show that $H(X,Y)=H(X)+H\left(Y/X\right)$. 8

OR

1 (a) A Non-symmetric binary channel is shown below :



Given V_o = 1000/sec

(i) Find $H(X), H(Y), H\left(\frac{X}{Y}\right)$ and $H\left(\frac{Y}{X}\right)$ when

$P(X=0)=\frac{1}{4}$, $Q(X=1)=\frac{3}{4}$, $\alpha=0.15$ and $\beta=0.9$.

(ii) Find the capacity of the channel for $\alpha=0.75$ and $\beta=0.90$.

10

(b) Define the terms :
(i) Average mutual information
(ii) Conditional Entropy.

6

UNIT - II

2 (a) Discuss Shannon Hartley channel capacity theorem.

8

(b) An analog signal having 4 kHz Band width is sampled at 1.25 times the Nyquist rate and each sample is quantized into one of 256 equally likely levels. Assume that the successive samples are statistically independent.
(i) What is information rate of this source ?
(ii) Can the output of this source be transmitted without error over an AWGN channel with a bandwidth of 10 kHz and an S/N ratio by 20 dB.
(iii) Find the S/N ratio required for error-free transmission for Part (b)
(iv) Find the bandwidth required for an AWGN channel for error-free transmission of the output of this source if the S/N ratio is 20 dB.

8

OR

2 (a) Prove that the channel capacity of a while-band limited Gaussian channel is

$$C=G\log\left(1+\frac{S}{N}\right)\text{lit/sec}$$

Where $G\rightarrow$ Channel Bandwidth

10

(b) A Gaussian channel has 1 MHz Bandwidth. Calculate the channel capacity if the signal power to noise spectrum density ratio (S/N) is 10^5 Hz. Also find the maximum information rate.

6

UNIT - III

3 (a) Explain the following with suitable example :

(i) Fixed length code

(ii) Variable length code

(iii) Optimal code

(iv) Uniquely Decodable code.

2+2+2+2=8

(b) State and prove Kraft's inequality. 8

OR

3 (a) Define following term :

(i) Code length

(ii) Code efficiency

(iii) Hamming distance

(iv) Source coding theorem.

2+2+2+2=8

(b) Construct Haffman's code for the following message ensemble :

$$[X]=[m_1, m_2, m_3, m_4, m_5, m_6]$$

$$[P(X)]=[0{\cdot}3, 0{\cdot}25, 0{\cdot}2, 0{\cdot}1, 0{\cdot}1, 0{\cdot}05]$$

8

UNIT - IV

4 The Parity check matrix of a particular (7, 4) linear block code is expressed as

$$H=\begin{bmatrix}1 & 1 & 1 & 0 & 1 & 0 & 0\\ 1 & 1 & 0 & 1 & 0 & 1 & 0\\ 1 & 0 & 1 & 1 & 0 & 0 & 1\end{bmatrix}$$

(i) Obtain the generator matrix (G)

(ii) List all the code vectors

(iii) What will the minimum distance between code vector ?

(iv) How many error can be detected ? How many error can be corrected ?

16

OR

15

4 The parity check matrix a (7, 4) Hamming code is expressed as under :

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}_{3\times 7}$$

Evaluate the syndrome vector for single bit errors.

16

UNIT - V

5 (a) Write comparison of Block Code and Convolutional Code.

8

(b) What is Cyclic code ? List their advantages and disadvantages.

8

OR

5 (a) What are Code tree, Code trellis and state diagram for convolution encoders.

8

(b) Explain viterbi algorithm.

8

4E2914

Roll No. : _____ Total Printed Pages : 3

4E2914

B. Tech. (Sem. IV) (Main / Back) Examination, June/July - 2013
4CS1 Microprocessor & Interface

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.
Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Explain the function of various control and status signals available on 8085 microprocessor. 8

(b) Why are AD_7 - AD_0 lines multiplexed ? with the help of latching circuit, explain how these lines are demultiplexed ? 8

OR

1 (a) Explain the function of program counter, Accumulator, stack pointer and flag register in 8085 microprocessor in brief. 8

(b) Explain the function of various types of buses in 8085 microprocessor in brief. 8

UNIT - II

2 (a) Explain the all type of Rotate instructions with the help of suitable examples. 8

(b) Write a program to store hexadecimal data AB in memory location 2300, split the data in the form of OA and OB, and store them in memory location 2501 and 2502.

8

OR

2 (a) Compare the function of the following instruction pairs :

(i) RST and RET

(ii) XTHL and XCHG

(iii) JMP and CALL

(iv) STAX and LDAX

8

(b) Describe various addressing modes available in 8085 microprocessor with two example of each.

8

UNIT - III

3 (a) What is the use of "Stack" ? Illustrate the PUSH and POP operations with help of suitable example.

8

(b) Draw block diagram of 8259 programmable interrupt controller and explain function of various blocks.

8

OR

3 (a) Explain the machine cycles of CALL and RET instructions with the help of timing diagram.

8

(b) What do you know about the interrupt facilities available with 8085. Explain the RIM and SIM instruction briefly.

8

UNIT - IV

4 (a) Explain various programming modes of 8279 keyboard and Display controller. Also draw a block diagram showing its interfacing with microprocessor 8085.

8

(b) Explain the all operation mode of 8255 in brief.

8

OR

4 (a) Explain the control word of 8254 PIT with example. Also explain the all operation modes of 8254 with diagram. 8

(b) Design a square wave generator with a pulse width of 150 μ sec. by using 8254. Set the timer in mode 3. The clock frequency is 2MHz. 8

UNIT – V

5 (a) Write brief technical note on bus standard RS 232C and IEEE 488. 8

(b) Draw the block diagram and pin description of USART 8251 and briefly explain formats of its mode, command and status words. 8

OR

5 (a) Explain the application of microprocessor in Interfacing scanned multiplexed display and liquid crystal display. 8

(b) Explain RS 422A in brief with the use of diagram. 8

4E2016

Roll No. : _____ Total Printed Pages : 3

4E2016

B. Tech. (Sem. IV) (Old Back) Examination, June/July - 2013
Computer Science
4CS3 Object Oriented Programming

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.
Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) What are the benefits of OOP ? Write applications of object oriented programming.

8

(b) Write short notes on :
(i) Aspect oriented programming
(ii) Functional programming.

4+4

OR

2 (a) What are the principles of parallel computing ? Give characteristics of parallel computing.

8

(b) Write short notes on :
(i) Event driven programming
(ii) Dynamic programming

4+4

UNIT - II

3 (a) What are classes ? Write a program to find greatest of three numbers using class. 8

(b) Describe all types of constructions with suitable examples. 8

OR

4 (a) Compare compile time polymorphism with run time polymorphism. Give suitable examples. 8

(b) Explain :
(i) Abstraction
(ii) Destructors. 4+4

UNIT - III

5 (a) What are virtual functions and virtual classes ? Write any program for virtual class. 8

(b) What is friend function ? How private data members are accured by outside the class. Explain by writing a program. 8

OR

6 Write short note on :
(i) Function overloading
(ii) Namespace and templates
(iii) Exception handling
(iv) Runtime type casting. 4+4+4+4

UNIT - IV

7 (a) What is Java byte code ? How it is related with JVM ? Explain by citing suitable examples. 8

(b) Explain by giving examples :
(i) Abstract classes
(ii) Using final with inheritance
(iii) Usage of super. 3+3+2

OR

8 (a) Define visibility in JAVA. Explain all types of visibility modifier and also compare them. 8

(b) Explain by writing program in JAVA :
(i) Overloading and overriding
(ii) Extender classes
(iii) Multilevel inheritance. 3+2+3

UNIT - V

9 (a) How does string class differ from string buffer class ? Explain by writing codes. 8

(b) Write a program to extract m characters from a string. Start the extraction from n^{th} character of the string. 8

OR

10 (a) Write a program for applet that receives four numbers as input from user and then display the largest number. 8

(b) Write short note on :
(i) Drawing polygons
(ii) Comparing of strings 4+4

4E2915

Roll No. : _____ Total Printed Pages : 3

4E2915

B. Tech (Sem. IV) (Back Old Scheme) Examination, June/July - 2013
Computer (Common for CP & IT)
4CS2 Microprocessor & Interfaces

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Nil 2. Nil

UNIT - I

1 Explain the internal architectural diagram of 8085 microprocessor. 16

OR

1 Describe the different types of addressing mode in 8085. 16

UNIT - II

2 (a) Write an assembly program and algorithm to convert a 16 bit number to a maximum of 5 unpacked digits. 8

(b) Write an algorithm and assembly program to convert an unpacked 4 digit BCD number to binary number. 8

OR

23

2 (a) Write an assembly language program to multiply two 8 bit data stored at location 2050H and 2051H and store the 16 bit result at 2052H and 2053H. 8

(b) Discuss the interrupt structure of 8085 microprocessor. What do you mean by masking of interrupts ? Explain SIM instruction. 8

UNIT - III

3 (a) Interface the stepper motor with 8255 and write an ALP to control the stepper motor. 8

(b) With a neat block diagram explain the operation of 8255. 8

OR

3 (a) Explain the operation of 8254 with neat block diagram. 8

(b) Write instructions to generate a 1kHZ square wave from counter-1. Assume the gate of counter 1 is tied to +5V through a 10 K resistor. Explain the significance of connecting the gate to +5 V. 8

UNIT - IV

4 (a) Differentiate RS-422 A and RS-423 A serial data standards. 8

(b) Explain the working of RS-232 C. 8

OR

4 (a) Explain the interrupt structure of 8259. 8

(b) Explain the operation of 8251 A with diagram. 8

UNIT - V

5 (a) Differentiate the 8085, 8086 and dual core processor. 8

(b) Explain the following 8086 instructions with suitable example :

(i) $\overline{DEN}$

(ii) $DT/\overline{R}$

(iii) $\overline{BHE}$

(iv) $MN/\overline{MX}$. 8

OR

5 (a) Explain the features of Pentium processor. 8

(b) Explain the various data types supported by MMX architecture. 8

4E2916

Roll No. : _____ Total Printed Pages : 3

4E2916

B. Tech. (Sem. IV) (Main) Examination, June/July - 2013
Computer Engg. & I.T.
4IT2 Principles of Programming Languages

Time : **3** Hours] [Total Marks : **80**
[Min. Passing Marks : **24**

*Attempt any **five questions**, selecting **one question** from **each unit**. **All** questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*
Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Nil 2. Nil

UNIT - I

1 What is binding ? Classify various bindings based on binding time ? Give examples of various bindings and binding time for the statement :
int a ;
a = a-1;

16

OR

1 (a) What are the attributes of a good programming language ? 8

(b) Why we need to study different kinds of programming languages ? 8

UNIT - II

2 (a) What do you mean by elementary data types ? Give speficications of any two elementary data types. 8

(b) What do you mean by structured data types ? Give speficications of any two structured data types. 8

OR

2 (a) Distinguish between static type checking and dynamic type checking. 8

(b) What do you mean by type equivalence and type conversion ? Explain with suitable exmaples. 8

UNIT - III

3 (a) Differentiate between simple and recursive subprograms. 8

(b) Differentiate between subprogram definition and activation. 8

OR

3 What do you mean by structured sequence control ? Also discuss the problems in structured sequence control. 16

UNIT - IV

4 (a) What is the role of parameter passing in subprogram invocation ? Explain the difference between call by value and call by referance. 8

(b) What do you mean by static and dynamic scope of an indentifier ? 8

OR

4 (a) What do you mean by exception handling. Explain difference between exception and compilation error. 8

(b) Explain the associativity and precedance of operation with suitable example. 8

UNIT - V

5 (a) Describe the storage management schemes for fixed size and variable size elements. 8

(b) Differentiate between static and stack based storage management. 8

OR

5 Explain the following with suitable examples :

(i) Abstract data type

(ii) Encapsulation

(iii) Information hiding

(iv) Garbage collection. 16

Roll No. : _____ Total Printed Pages : 3

4E2920

B. Tech. (Sem. IV) (Main / Back) Examination, June/July - 2013
Computer Science & Information Tech.
4CS6.1 Analog & Digital Communication

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

Attempt any five questions. Selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) With the help of circuit diagram explain the working of ring modulator for generating a DSB-SC signal. 8

(b) An SSB transmission contain 10 kW. This transmission is to be replaced by a standard amplitude modulated signal with the same power content. Determine the power content of the carrier and each of the side bands when the percentage modulation is 80%. 8

OR

1 (a) Explain the square law diode modulation method for AM generation. 8

(b) Explain the phase shift method of SSB generation. List its advantages and disadvantages with respect to the other methods. 8

19

UNIT - II

2 (a) Compare AM, FM and PM. 8

(b) Draw the circuit diagram of varactor diode modulator and explain its working. 8

OR

2 (a) Write short notes on :
(i) Pre emphasis
(ii) De emphasis. 8

(b) Explain the working of FM transmitter and receiver with block diagram. 8

UNIT - III

3 (a) Obtain an expression for signal to noise output ratio of a baseband PCM system in terms of input signal to noise ratio and number of quantization levels. 8

(b) Why companding is required in PCM system ? Explain briefly. 8

OR

3 (a) Draw and explain the working of delta modulation. Also explain adaptive delta modulation compare its performance with delta modulation. 8

(b) Write short note on comparison of PCM and DM. 8

UNIT - IV

4 (a) Write short notes on :
(i) PAM
(ii) PWM. 8

(b) Briefly explain unipolar and bipolar transmission. 8

OR

4 (a) Explain the concept of Nyquist criterion for distortion less base band binary transmission in communication system. 8

(b) Discuss PAM-TDM using suitable block diagram. 8

UNIT - V

5 Explain the binary ASK. What are the various techniques to generate ASK ? Explain coherent and non-coherent demodulation techniques of ASK. 16

OR

5 Explain PSK. What are modulation and demodulation technique of PSK ? Why coherent demodulation technique cannot be applied for PSK detection ? 16

4E2019

Roll No. : _____ Total Printed Pages : 3

4E2019

B. Tech. (Sem. IV) (Old Back) Examination, June/July - 2013
Computer Science (Common for Computer & IT)
4CS6.1 Analog & Digital Communication

Time : 3 Hours] [Total Marks : 80
[Min. Passing Marks : 24

*Attempt any **five** questions. Selecting **one** question from each unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever **necessary**. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Draw the block diagram of filter method for generating SSB signal for an audio-baseband signal and explain it. What are the frequency requirements of the filter ? 8

(b) What is the difference between direct and indirect methods of FM generation ? Explain the working of a balanced frequency discriminator with the help of circuit diagram. 8

OR

1 (a) A modulating signal $A_m \sin(2\pi f_m t)$ plus a bias V_b is applied to a pair of varactor diodes connecting across the parallel combination of 200 μH inductor and 100 pF capacitor as shown in fig. 1 (a). The capacitor of each varactor diode is related to voltage (in volts) applied across if m_f is doubled by having the modulating frequency, what will be the effect on the maximum deviation ?

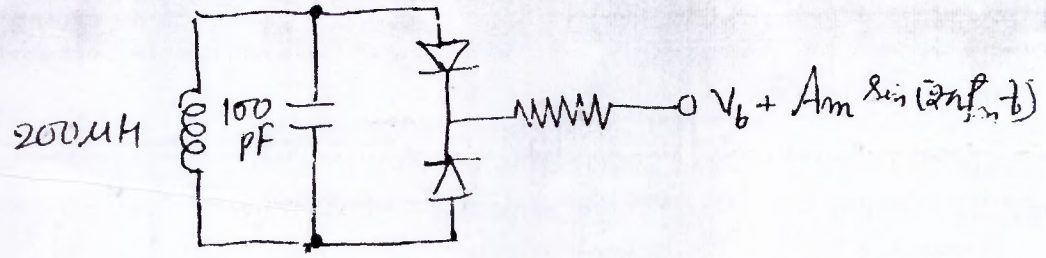


Fig. 1[a]

8

(b) Write the short note on pulse modulation techniques. 8

UNIT - II

2 (a) Compare the PCM and δ-modulation. 8

(b) Derive the expression for the signal to quantization noise ratio for the pulse code modulation (PCM). 8

OR

2 (a) Derive the expression for the signal to quantization noise ratio for δ-modulation. 8

(b) Write the short note on DPCM. 8

UNIT - III

3 (a) Draw the block diagram of the transmitter and receiver of BPSK and derive the expression for the probability of symbol error for BPSK. 8

(b) Determine the bandwidth required for M-ary FSK system. Draw the geometrical representation of M-ary FSK signals and find out the distance between the signals. 8

OR

3 (a) Explain the ASK system and derive the relation for error probability of Binary ASK. 8

(b) Draw the signal space representation of QPSK signals. Show that for the same data rate and same bit energy, BPSK and QPSK have the same bit error rate probability on the same AWGN channel, although one of the signals occupy half the bandwidth. 8

UNIT - IV

4 (a) Explain the dispersion in fiber optic communication. 8

(b) Explain the total internal reflection phenomenon used in the fiber optic communication. 8

OR

4 (a) Explain the connectors and splices. 8

(b) Describe the dispersion flattened fibers. 8

UNIT - V

5 (a) Write the short note on line coding schemes. How it can differ from source coding ? 8

(b) Explain the channel capacity theorem and derive the following expression regarding the channel capacity theorem :

$$C = B\log_2\left(1+{}^{S}\!/_{N}\right)$$

Where C = Channel capacity
B = Bandwidth
S/N = Signal to noise ratio 8

OR

5 Write the short notes on the following :

(a) Error detection and error correction 8

(b) Cyclic codes. 8

4E2917

Roll No. : _____ Total Printed Pages : 4

4E2917

B. Tech. (Sem. IV) (Main / Back) Examination, June/July - 2013
Computer Science & Information Tech.
4CS3 Discrete Mathematical Structures

Time : **3** Hours] [Total Marks : **80**
[Min. Passing Marks : **24**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.
Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Consider the following :
p : It is hot today
q : The temperature is 35°C
Write in simple sentence the meaning of the following :
(i) $p \vee q$ (ii) $\sim(p \vee q)$ (iii) $\sim(p \wedge q)$ (iv) $\sim p \wedge \sim q$

2×4=8

(b) State the converse, inverse and contra positive of the statement "If today is Easter, then tomorrow is Monday". Also construct truth table.

8

OR

1 (a) Show that the propositional formula $(p \wedge q) \wedge (r \wedge s) \Rightarrow p$ for any propositions p, q, r, s is a tautology.

6

(b) Check the validity of the following arguments :

$$\begin{array}{l} p \\ p \wedge q \Rightarrow r \vee s \\ q \\ \underline{\sim s} \\ r \end{array}$$

6

(c) Explain Quantifiers. Also write properties of quantifiers. 4

UNIT - II

2 (a) Define the following with example :

(i) Direct proof

(ii) Proof by contraposition

(iii) Proof by exhausting cares

(iv) Proof by contradiction.

3×4=12

(b) Write the decision algorithm with an example. Also write divisibility properties. 4

OR

2 (a) Show that any integer composed of 3^n identical digits is divisible by 3^n. 8

(b) State and prove fundamental theorem of arithmetic. 8

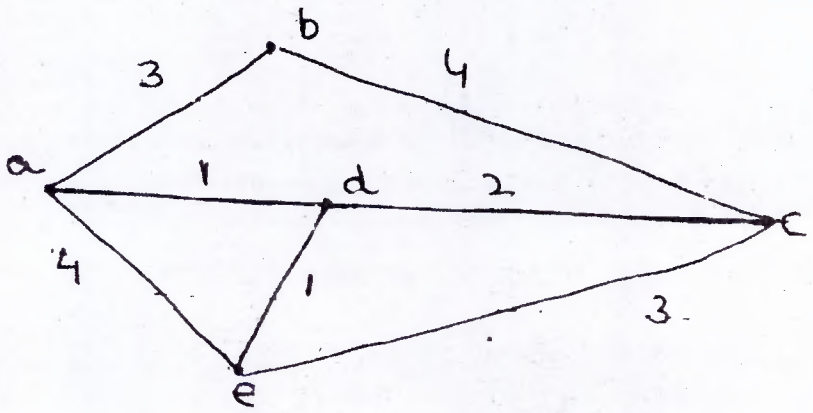
UNIT - III

3 (a) Explain the following graph operations with examples.
(i) Union (ii) Intersection (iii) Ring sum
(iv) Complementary graph.

2×4=8

(b) State the Kurtowski's theorem. 2

(c) Show how Kruskal's algorithm find a minimal spanning tree for the graph.



6

OR

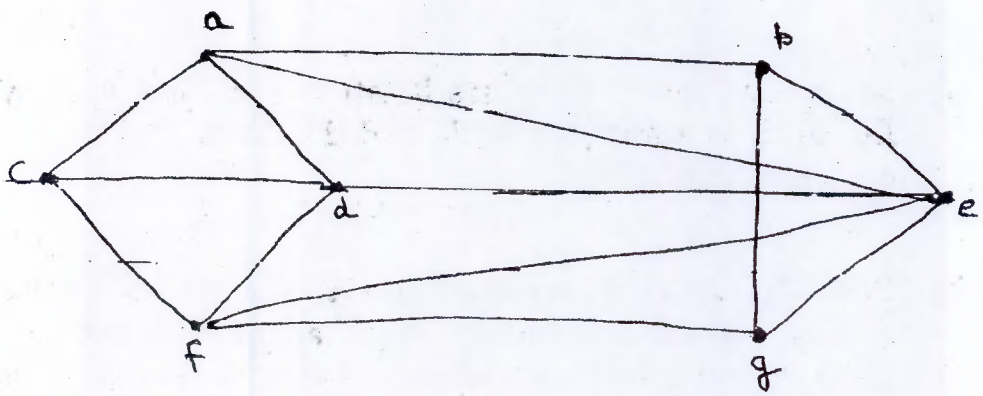
3 (a) Let G be a graph $G = (V, E)$ with k component where each component is a tree, obtain a formula in terms of $|V|, |E|$ and k.

8

(b) Define chromatic number of a graph, state the welch - Powell algorithm for finding chromatic number of a graph.

2

(c) Use Welch - Powell algorithm to paint the following graph with minimum number of colour.



6

UNIT - IV

4 (a) If A, B, C be finite sets then

$$n(A \cup B \cup B) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(C \cap A) + n(A \cap B \cap C)$$

8

(b) Participation in sports is compulsory in a school. In a class of 80 students, 60 play football 40 play basket ball. Find

(i) How many play both the games

(ii) Play football only.

8

OR

4 Out of 250 failed students, 128 fails in Maths, 87 in Physics and 134 in aggregate, 31 failed in Maths and Physics, 54 failed in aggregate and in Maths, 30 failed in aggregate and in Physics. Find how many candidates failed.

(i) All three subjects

(ii) In Maths not in Physics

(iii) In aggregate but not in Maths

(iv) In Physics but not in aggregate or maths

(v) In the aggregate or in Maths, but not in Physics.

16

UNIT - V

5 (a) Let $A = Z$ the set of integers Relation R defined by A by a Rb as 'a is congruent to b mod 2'. Show that R is an equivalence relation.

8

(b) Prove that an equivalence relation R on a set A decomposes A into equivalence classes which are either distinct or completely overlapping and the set A is the union of such distinct equivalence classes.

8

OR

5 (a) Show that in the power set $P(A)$ = (set of all subset of A), the relation of 'contained in defined as A_1 R A_2 if A_1 is a subset of A_2, is a partial order relation.

(b) Define the relations :

(i) Reflexive relation

(ii) Congruency relation

(iii) Symmetric relation

(iv) Asymmetric relation

(v) Transative relation

(vi) Anti symmetric relation.

8×2=16