

B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

(Examination at the end of Second Year)

Computer Science and IT

Paper I — MATHEMATICS — III

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsorily. ($15 \times 1 = 15$)

Answer ONE question from each Unit. ($4 \times 15 = 60$)

1.
 - (a) State Dirichelt's conditions for a Fourier Expansion.
 - (b) State the Fourier half range sine series for $f(x)$ in $(0, c)$.
 - (c) State Parseval's formula.
 - (d) State Root mean square (rms) value of $f(x)$ over (a, b) .
 - (e) Define Fourier sine and cosine transforms of $f(x)$.
 - (f) State modulation theorem of Fourier transform of $f(x)$.
 - (g) State convolution theorem for Fourier transforms.
 - (h) Write the general formula for Fourier transforms of the derivatives of a function.
 - (i) What is the order of convergence of the Newton Raphson method?
 - (j) Evaluate $\Delta^2 e^x$.
 - (k) Prove that $E = 1 + \Delta$.
 - (l) State Trapezoidal and Weddle's rule.
 - (m) State the formula for solving initial value problem by using Taylor's series method.
 - (n) State the standard five point formula for solving the Laplace's equation.
 - (o) Write the Newton's Backward difference formula.

UNIT I

2. (a) Obtain the Fourier series for $f(x) = \pi x$ in $0 \leq x \leq 2$.
- (b) Obtain the Fourier series for $f(x) = \left(\frac{\pi - x}{2}\right)^2$ in 0 to 2π .
- Or
- (c) If $f(x) = |\cos x|$, expand $f(x)$ as a Fourier series in the interval $(-\pi, \pi)$.
- (d) Obtain the Fourier series for $y = x^2$ in $-\pi < x < \pi$. Using that two values of y , show that $\frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} + \dots = \frac{\pi^4}{90}$.

UNIT II

3. (a) Find the Fourier transform of $f(x) = \begin{cases} 1 & \text{for } |x| < 1 \\ 0 & \text{for } |x| > 1 \end{cases}$

Hence evaluate $\int_0^{\infty} \frac{\sin x}{x} dx$.

- (b) Using the bisection method, find a real root the following equations correct to three decimal places $x - \cos x = 0$.

Or

- (c) Find the Fourier cosine transform of $f(x) = e^{-\frac{x^2}{e^2}}$.
- (d) Apply Gauss-Seidel iteration method to solve the equations.
 $20x + y - 2z = 17$; $3x + 20y - z = -18$; $2x - 3y + 20z = 25$.

UNIT III

4. (a) The area A of a circle of diameter d is given for the following values :

d :	80	85	90	95	100
A :	5026	5674	6362	7088	7854

Calculate the area of a circle of diameter 105.

- (b) Given the values :

x :	5	7	11	13	17
$f(x)$:	150	392	1452	2366	5202

evaluate $f(9)$ using Newton's divided difference formula.

Or

- (c) Use Gauss's forward formulae to evaluate y_{30} , given that $y_{21} = 18.4708$, $y_{25} = 17.8144$, $y_{29} = 17.1070$, $y_{33} = 16.3432$ and $y_{37} = 15.5154$.
- (d) Derive Lagrange's interpolation formula.

UNIT IV

5. (a) Use Simpson's $\frac{1}{3}$ rule and Simpson's $\frac{3}{8}$ rule, evaluate $\int_0^6 \frac{dx}{1+x^2}$.
- (b) Apply Runge-Kutta fourth order method, to find an approximate value of y when $x = 0.2$ given that $\frac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$.
- Or
- (c) Solve the partial differential equation $\nabla^2 u = -10(x^2 + y^2 + 10)$ over the square with sides $x = 0 = y$, $x = 3 = y$ with $u = 0$ on the boundary and mesh length = 1.
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(DCS/DIT 212)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012

(Examination at the end of Second Year)

Computer Science & IT

Paper II — BASIC ELECTRONICS

Time : Three hours

Maximum : 75 marks

Answer Question No.1 compulsorily ($15 \times 1 = 15$)

Answer ONE question from each Unit ($4 \times 15 = 60$)

1. (a) What is the characteristics of semi-conducting material?
- (b) Differentiate Half wave and Full wave rectifications.
- (c) Give an application of Clipper.
- (d) What are the uses of common emitter configuration?
- (e) How the operating point of a Transistor is specified?
- (f) Draw the typical transfer char. of a JFET?
- (g) What is common gate configuration?
- (h) Write the principle of operation of photo diode.
- (i) List the main parts of CRT.
- (j) What are the various types of oscillator?
- (k) What is the advantage of Feedback?
- (l) Give the general specifications of Op-Amplifier.
- (m) What is the use of Timer circuit?

- (n) Among Class A and Class B amplifiers, which is mostly preferred?
- (o) What is Voltage Regulator?

UNIT I

- 2. (a) Explain the operation of Zener diodes.
- (b) Develop the h-parameter model of a Transistor.

Or

- 3. (a) Explain Champing operation.
- (b) Explain how a transistor amplifiers the given signal.

UNIT II

- 4. (a) Explain the working of photo conducting cell.
- (b) Draw the characteristics of UJT and explain them.

Or

- 5. (a) Explain Self Bias configuration.
- (b) Explain the operation of LEDs in present day scenerio.

UNIT III

- 6. (a) Explain the principle on which oscillators will function.
- (b) Explain series Fed amplifier.

Or

- 7. (a) Draw the circuit of phase shift oscillator and explain.
- (b) Give the application of Class A and Class B amplifiers.

UNIT IV

8. (a) Explain constructional details of operational amplifiers.
- (b) Explain how an IC voltage regulator works.

Or

9. (a) Explain the working of operational amplifier as voltage summer and voltage buffer.
 - (b) Write a short notes as L.I.C. (Linear Integrated Circuit).
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(DCS/DIT 213)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

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Computer Science and IT

Paper III — DIGITAL LOGIC DESIGN

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsory. (15 marks)

Answer ONE question from each Unit. (4 × 15 = 60)

1. (a) Multiply 61_{10} by 14_{10} .
- (b) Explain BCD.
- (c) What is meant by Don't-Care Condition?
- (d) Draw Half Sub tractor.
- (e) Explain Decoder.
- (f) Explain regarding Dynamic Memories.
- (g) Explain PLD.

UNIT I

2. (a) Evaluate :
 - (i) Convert $(C3B1)_{16}$ into its Binary equivalent.
 - (ii) Convert 674 Decimal into Binary by using Power Method.
- (b) Given that $f(ABCD) = \Sigma(0,2,7,9,12,13,15)$ obtain the truth table and SOP and POS expression of f .

Or

3. (a) Design a digital circuit that has the following truth table. (It contains 3 NOT gates, 8 AND gates and 3 OR gates)

A	B	C	f
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

- (b) Simplify the above circuit using K – Maps.

UNIT II

4. Explain briefly regarding Full Adder and Full Sub tractor.

Or

5. (a) Describe briefly regarding Digital Multiplexer with a Block diagram.
(b) Design Multiplexer with Strobe input using NAND gates.

UNIT III

6. (a) Design J-K Flip Flop using NAND gates and explain.
(b) Design and explain Clocked S-R Flip Flop using NAND gate only.
(c) Design and explain Edge Triggered D Flip Flop.

Or

7. Explain the working of
(a) Synchronous Down Counter.
(b) Synchronous Up Counter.
(c) Asynchronous Ripple Counter.

UNIT IV

8. (a) Explain briefly regarding classification of ROM.
- (b) Describe briefly regarding Static and Dynamic Memory.

Or

9. (a) Explain Timing Sequences.
 - (b) Explain briefly regarding PLA and PAL.
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(DCS/DIT 214)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

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Computer Science and IT

Paper IV — DATA STRUCTURES

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsory. (15 × 1 = 15)

Answer ONE question from each Unit. (4 × 15 = 60)

1. Briefly explain following :
 - (a) ADT.
 - (b) Time complexity.
 - (c) Applications of linked list.
 - (d) Recursion.
 - (e) Linear search.
 - (f) Time complexity of quick sort.
 - (g) Heap condition.
 - (h) Single rotation.
 - (i) B+ tree.
 - (j) Complete binary tree.
 - (k) How are nodes linked together in a single linked list?
 - (l) Construct binary search tree for the data elements 20, 5, 30, 4, 45, 36, 21, 11, 16.
 - (m) Transform expression into
(a + b)/(c + d)*e + f postfix notation.

- (n) Degree of tree.
- (o) Give any two operations on AVL trees.

UNIT I

- 2. (a) Write a routine to insert and delete an element in single linked list.
- (b) Write a routine to merge two single linked lists as one single list.

Or

- 3. (a) Discuss various operations on double linked list.
- (b) How to analyze algorithm efficiency mathematically.

UNIT II

- 4. (a) Write a algorithm to convert a given infix expression into postfix form using the data Structure stack.
- (b) What is Queue? Explain about different queue operations.

Or

- 5. (a) Explain about binary search with suitable example.
- (b) Write short notes on circular queue.

UNIT III

- 6. By using merge sort algorithm sort the elements: 310, 285, 179, 652, 351, 423, 861, 254, 450, 520.

Or

- 7. (a) Explain about shell sort technique.
- (b) Write a C program for heap sort and estimates its time complexity.

UNIT IV

8. Draw a binary search tree for the following input list 60, 25, 75, 15, 50, 66, 33, 44. Trace the algorithm to delete the nodes 25, 75, 44 from the tree.

Or

9. (a) Write short notes on AVL trees.
(b) Describe the various operations on binary trees.
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(DCS 215)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

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Computer Science

Paper V — OBJECT ORIENTED PROGRAMMING

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsorily. (15 × 1 = 15)

Answer ONE question from each Unit. (4 × 15 = 60)

1.
 - (a) What is an object?
 - (b) Define data abstraction.
 - (c) What are the data members and member function?
 - (d) What is meant by dynamic binding?
 - (e) Write the process of programming in an Object oriented language.
 - (f) Give the applications of C++.
 - (g) Rules for naming the identifiers in C++
 - (h) What are the free store operators?
 - (i) What is manipulator?
 - (j) What is meant by enumerated data types?
 - (k) What is meant by function prototype?
 - (l) What is static data member?
 - (m) How an overloaded operator can be invoked using member function?
 - (n) Define an exception.
 - (o) What is stream?

UNIT I

2. (a) Explain about inline function? Write on what situations inline expansion may not work.
- (b) Explain about constructors and destructors with suitable example.

Or

3. (a) Compare structures, unions and classes.
- (b) Explain the 'object as function argument' with suitable example.

UNIT II

4. What is polymorphism? Explain different types of polymorphism with suitable example.

Or

5. (a) What is multiple inheritance? Explain it with suitable example.
- (b) What are virtual functions? Give the basic rules for virtual functions.

UNIT III

6. (a) Explain about C++ stream class in detail.
- (b) Write short notes on inserter and extractors

Or

7. (a) What is meant by type casting? Explain with suitable example.
- (b) Give the differences between C and C++.

UNIT IV

8. (a) How to create template? What are the advantages of templates? Give examples.
- (b) Write short notes on generic classes.

Or

9. Explain about different types of exceptions? How to handle exceptions in C++.
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(DCS 216)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

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Computer Science

Paper VI — ENVIRONMENTAL STUDIES

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 is compulsorily. (15 × 1 = 15)

Answer ONE question from each Unit. (4 × 15 = 60)

1. Briefly explain the following :
 - (a) Acqifier.
 - (b) Soil erosion.
 - (c) Eutrophication.
 - (d) Give land resources.
 - (e) Biodiversity.
 - (f) Nuclear hazards.
 - (g) Salinity.
 - (h) Stratification.
 - (i) Global warming.
 - (j) Red Data Book.
 - (k) Noise pollution.
 - (l) Pollution explosion.
 - (m) What is air act and water act?
 - (n) Deforestation.
 - (o) Human rights.

UNIT I

2. (a) What is scope of environmental education?
(b) What are renewable and non-renewable resources? Give examples.

Or

3. Discuss about energy resources, mineral resources and associated problems.

UNIT II

4. Describe the different types and characteristics of forest and desert ecosystems.

Or

5. (a) Comment upon Indian biodiversity with special reference as mega diversity nation.
(b) What are the major threats to bio-diversity.

UNIT III

6. (a) Enumerate various methods for control of air pollution.
(b) Classify solid waste. What are the sources of urban and industrial solid wastes?

Or

7. (a) Discuss the measures of conserve water.
(b) Discuss the issues involved enforcement of environmental legislation.

UNIT IV

8. Discuss various issues and measures for women and child welfare at international and national level.

Or

9. Discuss the salient features of draft declaration of human rights and environment.
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Computer Science

Paper I — MATHEMATICS — IV

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsorily. ($15 \times 1 = 15$)

Answer ONE question from each Unit. ($4 \times 15 = 60$)

1. (a) Define harmonic function.
- (b) State Cauchy-Riemann equations in polar form.
- (c) Show that the function $f(z) = xy + iy$ is everywhere continuous but is not analytic.
- (d) State Cauchy's integral theorem.
- (e) State Taylor's series.
- (f) Define isolated singularity of an analytic function.
- (g) Find the nature and location of singularities of the function $f(z) = \frac{z - \sin z}{z^2}$.
- (h) Define pole of an analytic function.
- (i) What type of singularity have the following function $f(z) = \frac{1}{1 - e^z}$?
- (j) State Residue theorem.
- (k) State the two properties of Calculation of residues.
- (l) Write Bessel's polynomial function.
- (m) Write the Lagender's differential equation.
- (n) Write generating function for Bessel's function.
- (o) Prove that $P_1(x) = x$.

UNIT I

2. (a) Find the analytic function, whose real part is $\frac{\sin 2x}{\cosh 2y - \cos 2x}$.
- (b) Find the orthogonal trajectories of the family of curves $x^4 + y^4 - 6x^2y^2 = \text{constant}$ by using analytic functions technic.

Or

3. (a) Prove that $u = x^2 - y^2$ and $v = \frac{y}{x^2 + y^2}$ are harmonic functions of $f(x, y)$ but are not harmonic conjugates.
- (b) If $f(z)$ is an analytic function of z , prove that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) \log|f(z)| = 0$.

UNIT II

4. (a) Evaluate $\int_c \frac{z^2 - z + 1}{z - 1} dz$, where C is the circle (i) $|z| = 1$ (ii) $|z| = \frac{1}{2}$.
- (b) Expand the following function in Laurent's series :

(i) $f(z) = \frac{1}{z - z^2}$ for $1 < |z + 1| < 2$

(ii) $f(z) = \frac{1}{(z - 1)(z + 3)}$ for $1 < |z| < 3$.

Or

5. (a) Evaluate $\int_0^{2+i} (\bar{z})^2 dz$, along (i) the line $y = \frac{x}{2}$ (ii) the real axis to 2 and then vertically to $2 + i$.
- (b) Find Taylor's expansion of $f(z) = \frac{2z^3 + 1}{z^2 + z}$ about the point $z = i$.

UNIT III

6. (a) Apply the calculus of residues, to prove that $\int_0^{2\pi} \frac{d\theta}{1 - 2r \cos \theta + r^2} = \frac{\pi}{1 - r^2}$.

(b) Solve the following equation in series :

$$\frac{d^2 y}{dx^2} + x^2 y = 0.$$

Or

7. (a) Solve in series equation

$$(1 - x^2) \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2y = 0.$$

(b) Apply the calculus of residues, to prove that

$$\int_0^{\pi} \frac{d\theta}{17 - 8 \cos \theta} = \frac{\pi}{15}.$$

UNIT IV

8. (a) Prove that $\int_0^{\infty} e^{-ax} J_0(bx) dx = \frac{1}{\sqrt{a^2 + b^2}}$.

(b) State and prove Rodriques's formula for Legendre polynomials.

Or

9. (a) Prove that $J_{\frac{1}{2}}(x) = \left[\sqrt{\frac{2}{\pi x}} \right] \sin x$.

(b) Prove that $(2n + 1) P_n(x) = P'_{n+1}(x) - P'_{n-1}(x)$.

(DCS 222)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012

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Computer Science

Paper II — CIRCUIT THEORY

Time : Three hours

Maximum : 75 marks

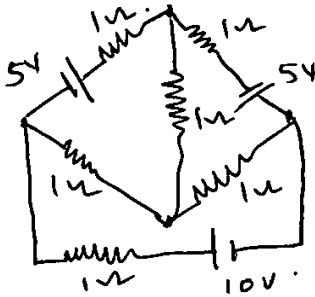
Answer Question No.1 compulsorily. (15 × 1 = 15)

Answer ONE question from each Unit. (4 × 15 = 60)

1.
 - (a) Define Electric charge.
 - (b) Give the relation between Power and Energy.
 - (c) What is an ideal Resistance?
 - (d) Define Closed loop.
 - (e) Give an example, when KCL can be used.
 - (f) Draw the characteristics of a practical voltage source.
 - (g) Why a voltage source is replaced by open ckt in superposition theorem.
 - (h) What is the importance of sinusoidal waveform?
 - (i) State Reciprocity theorem.
 - (j) Give the application of Tellegers theorem.
 - (k) State why there are NO transients in an pure 'R' Network.
 - (l) What is the phase difference between the voltages in a 3-phase system?
 - (m) If a positive sequence of a 3 phase is RYB, what is the negative sequence?
 - (n) When a network is called as Bi-lateral network?
 - (o) Draw a typical two port network.

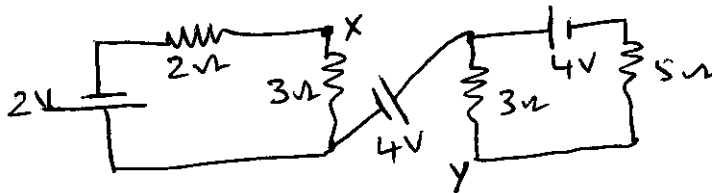
UNIT I

2. (a) Derive an expression to find the energy stored in an inductor.
 (b) Determine the branch currents, when the value of each branch resistance is $1\ \Omega$.



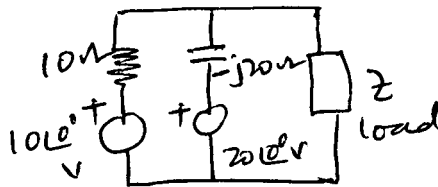
Or

3. (a) Explain source transformation.
 (b) Obtain the potential difference V_{xy} .



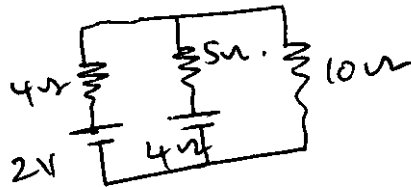
UNIT II

4. (a) Explain the significance of 'j' notation in the sinusoidal analysis.
 (b) Determine the load impedance for maximum power transfer.



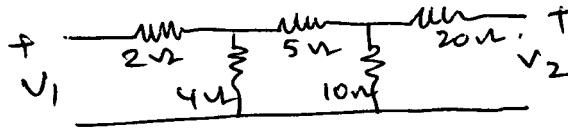
Or

5. (a) Derive an expression to find the effective value of a half wave rectifier sinusoidal wave.
- (b) Determine using Norton's theorem, the potential difference across the $10\ \Omega$ resistor.



UNIT III

6. (a) Explain the significance of Time constant in RLC circuits.
- (b) Determine Z-parameters :



Or

7. (a) Explain how h-parameters can be obtained from Y-parameters.
- (b) An RLC series circuit has $R = 6.7\ \Omega$; $L = 0.54\ \text{H}$ and $C = 6\ \mu\text{F}$. Calculate the resonant frequency and current at resonance if the applied voltage is 220 V.

UNIT IV

8. (a) Give the advantage of 3 phase system.
- (b) Three similar coils with $10\ \Omega$ resistance and $10\ \Omega$ reactance are connected in star across 400 V, 3 phase supply. Find the line current and the power consumed.

Or

9. (a) Explain two watt meter method to measure the power in an unbalanced 3 phase network.
- (b) Explain the interconnection of 3-phase sources and loads.
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Paper III — COMPUTER ORGANIZATION

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsorily. (15 × 1 = 15)

Answer ONE question from each Unit. (4 × 15 = 60)

1. (a) What is Binary Adder?
- (b) What is meant by Memory Transfer?
- (c) The basic Instruction Cycle consists of.
- (d) Draw Micro programmed Control Organization.
- (e) What is meant by mapping of Instruction?
- (f) Define Stack Organization.
- (g) Write Three Address Instruction format.
- (h) What is RISC?
- (i) Define Index Addressing Mode.
- (j) Define Booth's Multiplication Algorithm.
- (k) What is Asynchronous Data Transfer?
- (l) What is meant by burst Transfer?
- (m) Define CAM.

- (n) Define Virtual Memory.
- (o) What is I/O interface?

UNIT I

- 2. (a) Explain briefly regarding Bus and Memory Transfer with neat diagram. (8)
- (b) Describe Arithmetic Logic Shift Unit. (7)

Or

- (c) Discuss list of Register for the Basic Computer. (7)
- (d) Explain briefly regarding Timing and Control Unit. (8)

UNIT II

- 3. (a) Discuss all the Memory Reference Instruction. (7)
- (b) Explain Input- Output and Interrupt. (8)

Or

- (c) Explain the Design of Control Unit. (8)
- (d) Briefly explain various Addressing Modes. (7)

UNIT III

- 4. (a) Explain briefly regarding Stack Organization. (7)
- (b) Explain Instruction Formats with example. (8)

Or

- (c) Discuss different types of Interrupts. (7)
- (d) Differentiate CISC and RISC. (8)

UNIT IV

5. (a) Explain briefly regarding Multiplication Algorithm. (7)
(b) Explain briefly regarding Associative Memory. (8)

Or

- (c) Explain Priority Interrupt. (7)
(d) Explain Direct Memory Access. (8)
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Paper IV — DISCRETE MATHEMATICAL STRUCTURES

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsorily. (15 × 1 = 15)

Answer ONE question from each Unit. (4 × 15 = 60)

1. (a) $A = \{1,2,4,6\}$; $B = \{2,4,5,9\}$ find $A \Delta B$.
- (b) $A = \{x/x \text{ is positive integer and } 25 \geq x^2\}$;
 $B = \{1,2,4,6,8\}$ find $A-B$.
- (c) Is $P \rightarrow P \vee Q$ tautology.
- (d) Prove by method of contradiction "For every integer n , if n^2 is odd, then n is odd".
- (e) $A = \{1,2,3\}$, $B = \{2,4,5\}$ then how many number of relations can we define from A to B .
- (f) Define compliment of a relation.
- (g) Define digraph for a relation.
- (h) Define anti-symmetric relation.
- (i) Give an example for a transitive relation.
- (j) Define Poset.
- (k) Draw the digraph for the relation $R = \{(1,1),(1,2),(2,1),(2,2),(3,3)\}$.
- (l) Write the Number of nodes in a tree of height ' n '.
- (m) Solve $a_{n+1} = 4a_n$ for $n \geq 0$ and $a_0 = 7$.
- (n) Define Hamiltoncircuit.
- (o) How many strings of length 5 can be formed using FLOWER.

UNIT I

2. (a) Prove that power set of set A having 2^n , where 'n' is the number of elements in A.
(b) Construct the truth table for $((P \vee Q) \rightarrow R) \leftrightarrow ((P \rightarrow R) \vee (Q \rightarrow R))$.

Or

3. (a) Consider the following argument and verify whether it is valid or not
I will get grade A in this course or I will not graduate.
If I do not graduate, I will join the army
I got grade A.

Therefore, I will not join the army.

- (b) Prove that the following logical equivalences.
(i) $\exists x, (P(x) \vee Q(x)) \leftrightarrow \exists x P(x) \vee \exists x Q(x)$.
(ii) $\sim(\forall x, \sim P(x)) \leftrightarrow \exists x, P(x)$.

UNIT II

4. (a) Prove that $n(n^2+5)$ is a factor of 6 using mathematical induction.
(b) Determine the integral solutions of
 $X_1 + X_2 + X_3 + X_4 = 25$ where
 $X_1 \geq 0, X_2 \geq 0, X_3 \geq 7, X_4 \geq 7$.

Or

5. (a) In how many ways can 24 pencils be distributed among four children such that each child gets at least 3 but not more than eight.
(b) Use induction to prove that $n^3 - n$ is divisible by 3 where n is a positive integer.

UNIT III

6. (a) Solve the recurrence relation $a_{n+1} = 2a_n + 5$, for $n \geq 0$ and $a_0 = 1$ using Generating.
(b) Find the recurrence relation and the initial condition for the sequence 2, 10, 50, 250.... and also find general term.

Or

7. (a) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for $n \geq 2$ and $a_0 = 1, a_1 = -2$.

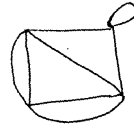
- (b) Solve the recurrence relation $a_{n+1} = a_n + 2^n$ for $n \geq 0$, $a_0 = 1$.

UNIT IV

8. (a) Find the transitive closure of the digraph whose adjacency matrix is.

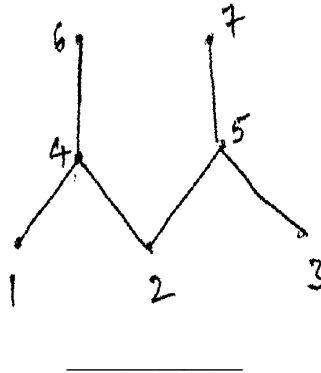
$$\begin{matrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{matrix}$$

- (b) Find the degrees and the out-degrees of the vertices of the following graph.



Or

9. (a) Draw the Hasse diagram for the relation “a divides b” on D_{36} a set of divisors of 36.
(b) Determine the matrix of the partial order whose Hasse diagram is given below.



B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

(Examination at the end of Second Year)

Computer Science

Paper V — FILE STRUCTURES

Time : Three hours

Maximum :75 marks

PART A – (5 × 3 = 15 marks)

Answer ALL questions

1. (a) Define File structures. Give the names of flags.
- (b) What are the applications of Depth first search?
- (c) What is the topological sort?
- (d) Describe about Indexing.
- (e) What is minimum spanning tree?

PART B – (4 × 15 = 60 marks)

Answer ALL questions

2. (a) Define hashing. What is the simple hashing algorithm?
 - (b) What is open addressing? Explain about Rehashing.
 3. (a) Explain Dijkstra's Algorithm. With an example.
 - (b) Describe about Directed graphs.
 4. What are the fundamental file processing operations? Explain in detail.
 5. (a) What are the fundamental methods for managing files of records?
 - (b) How do you add a simple index to the sequence set?
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(DCS 226)

B.Tech. DEGREE EXAMINATION, DECEMBER 2012.

(Examination at the end of Final Year)

Computer Science

Paper VI — MICROPROCESSORS

Time : Three hours

Maximum : 75 marks

Answer Question No. 1 compulsorily. (15 marks)

Answer ONE question from each Unit. (4 × 15 = 60)

1. Write briefly on the following
 - (a) Give examples for pseudo instructions of 8086 assembler with description. (2)
 - (b) What is a macro? (2)
 - (c) What are the differences between 8086 and 80286 microprocessor? (2)
 - (d) What is the difference between OV and CF flag? (2)
 - (e) What are assembler directives? (2)
 - (f) Why refreshing is needed for dynamic RAMS? (2)
 - (g) What is modular programming? (3)

UNIT I

2.
 - (a) Write the functional block diagram of 8086 and explain how 8086 is reset with power-on and manual operation and write the after-effect of resetting 8086.
 - (b) Write the merits and demerits of memory segmentation in 8086.

Or

- (c) Implement WHILE-Do construct using 8086 assembly language program that can generate exec file with assembler and linker.
- (d) Explain the function of segment registers of 8086.

UNIT II

- 3. (a) Explain about the assembler directives of 8086 Microprocessor.
- (b) Explain the implementation of REPEAT-UNTIL directive.

Or

- (c) Write an ALP to find out number of even and number of odd numbers from a given series of 16 bit hexadecimal numbers.
- (d) List three methods of passing parameters to a procedure with relative merits and demerits.

UNIT III

- 4. (a) Write and explain the basic system timing of 8086 in minimum mode.
- (b) Explain the basic 8086 system timing with a diagram.

Or

- (c) Explain the 8086 memory banks with a block diagram.
- (d) Explain the interrupt structure of 8086.

UNIT IV

- 5. (a) Explain about 80186's programmable interrupt controller.
- (b) Explain READ and WRITE modes of operation using DMA controller in 8086 system.

Or

- (c) Explain the 8086 maximum mode of operation.
 - (d) Describe the features of 8087 math co-processor.
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