

SUBJECT CODE NO:- P-15
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(ALL-BRANCHES) Examination May/June 2017
Engineering Mathematics - III
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q. No. 1 and Q. No.6 are compulsory
 - ii) Solve any two questions from Q. Nos. 2, 3, 4 and 5.
 - iii) Solve any two questions from Q. Nos. 7, 8, 9 and 10.
 - iv) Use of non-programmable calculator is allowed.
 - v) Figures to the right indicate full marks.

Section A

- Q.1 Solve any five from the following 10
- a) Solve $(D^2 - 4D - 12)y = 0$
 - b) Solve $(D^2 + 2\pi D + \pi^2)y = 0$
 - c) Find the P.I. of the equation $(D^2 + D - 6)y = e^{2x}$
 - d) Find the P.I. of the equation $(D^3 + 4D)y = \sin 2x$
 - e) Find the mean of the following data

Class	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f:	6	5	15	10	5	4	3

- f) Find the area under the normal curve between $Z = -1.24$ to 1.24
 - g) For a binomial distribution the mean is 12 and the variance is 4, find all the constants of the distribution.
 - h) A 2 lb weight – suspended from a spring stretches it 1.5 inches. If the weight is pulled 3 inches below the equilibrium position and released set up a differential equation of motion.
- Q.2
- a) Solve $(D^2 + 2)y = e^x \cos 2x$ 05
 - b) Calculate the mean deviation from the median for the following data 05

Class	50-100	100-150	150-200	200-250	250-300	300-350
f:	7	18	25	31	15	4

- c) An emf of 200V is in series with a 10 ohm resistor, a 1 henry inductor and 0.02 Farad capacitor At $t=0$, the charge Q and current I are zero. Find Q and I at any time t. 05
- Q.3
- a) Calculate the mean and standard deviation for the data 05

Class	68-74	75-81	82-88	89-95	96-102	103-109
f:	5	31	40	20	3	1

- b) Solve without using method of variation of parameters $(D^2 + 9)y = \sec 3x$ 05
- c) The differential equation of a cantilever beam of length l and weighing w kgs/unit, subjected to a horizontal compressive force P applied at the free end is given by 05

$EI \frac{d^2y}{dx^2} + Py = \frac{-1}{2} Wx^2$, if $y = \delta$
 And $\frac{dy}{dx} = 0$ at $x=l$ and $\frac{d^2y}{dx^2} = 0$ at $x=0$, find the maximum deflection of the beam

Q.4 a) Solve by method of variation of parameters

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$$(D^2 + 1)y = \frac{1}{1 + \sin x}$$

b) The income distribution of a group of 10000 persons was found to be normal with mean Rs.7500 and the standard deviation Rs.500. What is the number of persons of this group which have income

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i) exceeding Rs.6680 ii) exceeding Rs.8320.

c) If a weight 6 lbs hangs from a spring with constant $K = 12$ and no damping force exists, find the motion of weight when an external force $3 \cos 8t$ acts, initially $x=0, \frac{dx}{dt} = 0$. Determine whether resonance occurs.

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Q.5 a) Solve $x^2 \frac{d^3y}{dx^3} + 3x \frac{d^2y}{dx^2} + \frac{dy}{dx} = x^2 \log x$

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b) Fit the curve $y = ae^{bx}$ for the data

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X:	1	2	3	4	5	6
Y:	1.6	4.5	13.8	40.2	125	300

c) The first three moments of a distribution about the value 2 are 1, 16 and -40. Find mean, variance and

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μ_3

Also find the first three moments about $x=0$

Section B

Q.6 Solve any five

10

a) Find the first approximate value of the root (i.e. X_1) by Newton – Raphson method for $x e^x - 2 = 0$, correct to 3 decimal place.

b) find $f(8)$ for the data

x	5	6	9
f(x)	12	13	14

c) Find the values of x, y, z in the first iteration by Gauss seidel method for

$$54x + y + z = 110$$

$$2x + 15y + 6z = 72$$

$$-x + 6y + 27z = 85$$

d) Find grad ϕ at $(1, -2, -1)$, if

$$\phi = 3x^2y - y^3z^2$$

e) show that the vector

$$\vec{v} = e^x \sin y \mathbf{i} + e^x \cos y \mathbf{j}$$
 is irrotational

f) Evaluate $\int_C \vec{F} \cdot d\vec{r}$ Where $F = x^2 \mathbf{i} + xy \mathbf{j}$

c: $y = 0$

between points $(0,0)$ to $(a,0)$

g) find $\nabla^2 (r \log r)$

h) Write statement of Stoke's theorem.

Q.7 a) Solve by Gauss Seidel Method

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$$10x + 2y + z = 9$$

$$2x + 20y - 2z = -44$$

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$$-2x + 3y + 10z = 22$$

b) Find the directional derivative of

$$f = x^2 - y^2 + 2z^2$$

at the point (1,2, 3) in the direction towards the point (2,1,4)

c) Show that vector field

$$\vec{F} = 2x(y^2 + z^3)\mathbf{i} + 2x^2y\mathbf{j} + 3x^2z^2\mathbf{k}$$

is conservative. Find the work done in moving a particle from

(-1,2, 1) to (2, 3, 4)

Q.8 a) Find a root of the equation correct to three decimal places

$$\log x - \cos x = 0$$

b) Show that $f(r)\vec{r}$ is always irrotational

c) Evaluate by Green's theorem

$$\int_c \vec{F} \cdot d\vec{r}, \text{ where } \vec{F} = x^2\mathbf{i} + xy\mathbf{j}$$

And c is a triangle having

Vertices A (0,2) , B(2,0) and C (4,2)

Q.9 a) Find $\frac{dy}{dx}$ at $x = 1.9$ for the data

x	1.1	1.3	1.5	1.7	1.9
y	0.21	0.69	1.25	1.89	2.61

b) Using stoke's theorem evaluate

$$\int_c [(x + y)dx + (2x - z)dy + (y + z)dz]$$

c

Where c is the boundary of the triangle with vertices (2,0,0), (0,3,0) and (0,0,6)

c) Show that $\vec{F} = (6xy + z^3)\mathbf{i} + (3x^2 - z)\mathbf{j} + (3xz^2 - y)\mathbf{k}$ is irrotational. Find scalar ϕ such that $F = \nabla\phi$.

Q.10 a) Use Runge Kutta method of order 4

to approximate y when $x=1.1$,

given that $y(1) = 1.2$ and

$$\frac{dy}{dx} = 3x + y^2, \text{ take } h=0.1$$

b) Solve by Euler's modified method

$$\frac{dy}{dx} = -xy^2, y(0) = 2$$

find y (0,2) by taking $h = 0.2$

c) Evaluate

$$\iint_S \vec{F} \cdot \hat{n} ds \text{ where}$$

$\vec{F} = 4xz\mathbf{i} - y^2\mathbf{j} + yz\mathbf{k}$ and S is the surface of the cube

bounded by $x=0, x = 1, y=0, y=1, z=0, z=1$

Subject Code : 44

FACULTY OF ENGINEERING & TECHNOLOGY
S.E. (CSE/IT) (Revised) Examination
APRIL/MAY, 2017

Computer Networks – I

Time : Three Hours

Max. Marks: 80

“Please check whether you have got the right the question paper”

- Note: i) *Q.No. 1 & 6 are compulsory.*
ii) *Attempt any two questions from Question No. 2 to 5 and Q.No. 7 to 10 of each section.*

SECTION – A

- Q.1 Attempt any Five. 10
- (i) Identify the five components of a data communication system.
 - (ii) What is the difference between half duplex and full duplex transmission modes?
 - (iii) Distinguish between baseband transmission and broadband transmission
 - (iv) Define the term throughput and latency.
 - (v) What is multiplexing?
 - (vi) *What is hamming distance for each of the following words?*
(a) d(10000,00000), (b) d(000,000)
 - (vii) Define single bit error.
- Q.2 (a) Explain with neat labeled diagram of different topologies used in networking. 08
(b) Explain Manchester and differential Manchester encoding scheme in detail. 07
- Q.3 (a) How do the layers of the internet model correlate to the layers of due OSI model? 08
(b) Discuss the various responsibilities of data link layer. 07
- Q.4 (a) If the 7 bit hamming codeword received by a receiver is 1011011. Assuming the even parity, state whether the received codeword is correct or wrong. If wrong locate the bit in error. 08
(b) Generate the CRC code for the data word of 110010101. The division is 10101. 07
- Q.5 Write short note on (Any three) 15
- (i) Categories of networks.
 - (ii) Circuit switched network
 - (iii) Linear Block Code
 - (iv) MAC address
 - (v) Bandwidth.

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Subject Code : 44

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SECTION – B

- Q.6 Attempt any Five. 10
- (i) What is random access?
 - (ii) Define p-persistent.
 - (iii) Define unicast, multicast and broadcast.
 - (iv) Explain frequency reuse patter.
 - (v) What are connecting devices?
 - (vi) Find the class of each address
(a) 14.23.120.8 (b) 114.34.2.8
 - (vii) Change the following IP address from dotted decimal notation to binary notation.
(a) 193.131.27.255 (b) 129.11.11.239
- Q.7 (a) Explain CSMA/CA protocol with suitable diagram. 08
- (b) Explain cellular telephony in detail. 07
- Q.8 (a) Explain why collision is an issue in random access protocol but not in controlled access on channelizing protocols. 08
- (b) Compare the window size, number of bits used for frame numbering and size of buffer for the three ARQ techniques. 07
- Q.9 (a) Explain the IPV₄ format with the help of neat diagram. 08
- (b) Explain Bluetooth architecture in detail. 07
- Q.10 Write a short note on (Any three) : 15
- (i) CDMA
 - (ii) Piggybacking
 - (iii) Reservation
 - (iv) Switch
 - (v) IEEE 802.11

SUBJECT CODE NO:- P-75
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CSE/IT) Examination May/June 2017
Data Structures using C
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
 - ii) Solve any two questions from each section from the remaining questions.

Section A

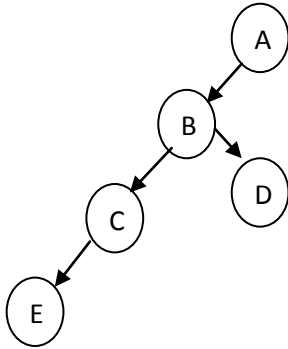
- Q.1 Solve any five 10
- a) Explain address (&) operator and dereferencing (*) operator.
 - b) Define time and space complexity
 - c) Explain two-dimensional array
 - d) Explain realloc () and calloc () functions with example.
 - e) Write push function to add an item to a stack.
 - f) What are disadvantages of queue? How to overcome it?
 - g) What is multiple queue?
 - h) Assume stack of size 2 and show diagrammatic representation for following operations: PUSH(20) , PUSH(40), POP() , PUSH(50) , PUSH (60). Indicate top pointer.
- Q.2 08
- a) Define Algorithm. Explain all criteria that every algorithm should satisfy.
 - b) Write C program for transpose of sparse matrix. 07
- Q.3 07
- a) Create an ADT for natural number to perform operations: ISZero, Zero, Equal, successor, add, subtract, multiply, divide.
 - b) How to represent circular singly linked list. Explain insert and delete operations on circular singly linked list. 08
- Q.4 07
- a) Evaluate given postfix expression using stack. 07
 $6 \ 2 / \ 3 \ - \ 4 \ 2 \ * \ +$
 - b) How to represent polynomial? Write a function to add two polynomials. 08
- Q.5 07
- a) Write C Program to implement queue using dynamic array.
 - b) What is linked list? Explain different types of linked list with example. 08

Section B

- Q.6 Solve any five of the following 10
- a) Give the array representation of a binary tree.
 - b) Define complete binary tree, Give example.
 - c) What is heap? Give max heap property?
 - d) What is path and cycle in graph?
 - e) Define single ended and double ended priority queue
 - f) What is weight biased leftist tree

- g) What is balance factor in AVL tree
- h) What is property of binary search tree?

- Q.7 a) Define a forest. How to transform a forest into a binary tree. Explain all forest transversal techniques. 08
 b) Explain Fibonacci heap with example? 07
- Q.8 a) What is threaded binary tree? Show threaded binary tree representation of the given binary tree 07



- b) Define height-balanced binary tree. Assume that insertions are made in the following order. Uranus, Earth, Venus, Mars, Mercury, Jupiter, Saturn, Neptune. 08
- Q.9 a) Explain graph representation techniques : 07
 1) Adjacency matrix
 2) Adjacency List
- b) Define pairing Heap & explain all operations on pairing heap. 08
- Q.10 a) Start with an empty red-black tree & insert the following keys in the given order 15, 14, 13, 12, 11,10,9. 07
 b) Explain in order preorder and postorder traversals for binary tree with algorithm and example. 08

SUBJECT CODE NO:- P-108
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CSE/IT) Examination May/June 2017
Unix & Shell Programming
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- Question 1 & 6 are compulsory
 - Attempt any two questions from Question No.2 to 5 and any two questions from Question No.7 to 10.

Section A

- Q.1 Attempt any Five 10
- i) What is process?
 - ii) Explain use of 'WC' command
 - iii) Explain 'MV' & 'CP' command
 - iv) What is zombie?
 - v) Explain 'man' & 'appropos' command
 - vi) Define term Escaping.
 - vii) Write about 'passwd' & 'pwd' command
- Q.2 a) Explain 'ls' command with its all options 08
b) Explain Unix architecture with neat diagram 07
- Q.3 a) Explain command structure with command types? Describe the flexibilities of command usage 08
b) Write short note on navigation in Vi editor 07
- Q.4 a) How to locate a file? What are selection criteria's used for locating files? Give suitable example 08
b) Explain various environment variables 07
- Q.5 a) Explain tree structure of Unix File System. 08
b) Explain the mechanism of process creation 07

Section B

- Q.6 Attempt any Five 10
- i) set command
 - ii) What is sticky bit? How to set sticky bit?
 - iii) Explain 'head' & 'tail' command
 - iv) Explain 'chop' function?
 - v) Explain 'Expr' command
 - vi) Explain 'awk' 'split ()' function
 - vii) What is use of tr-command
- Q.7 a) Write short note on 'grep' 08
b) What are basic regular expression symbols in shell? 07

- Q.8 a) How do you test file properties? Explain with suitable example 08
b) Write a shell script to perform various operations on string and explain all string comparison operators 07
- Q.9 a) Write short note on 'awk' inbuilt variables. 08
b) Explain 'cut' and 'paste' filters with suitable example. 07
- Q.10 a) What is perl associative array? Give example of script which uses same. 08
b) Explain 'split ()' and 'join ()' functions in perl. Give suitable examples 07

SUBJECT CODE NO:- P-142
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CSE/IT) Examination May/June 2017
Digital Electronics
(Revised)

[Time:ThreeHours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and Q.No.6 are compulsory.
 - ii) Attempt any two questions from Q.2 to Q.5 and two question from Q.7 to Q.10

Section A

- | | | |
|-----|---|--------------|
| Q.1 | Solve any two question (each for 2 marks) | 10 |
| | <ul style="list-style-type: none"> a) What is along signal ? b) What is dints care condition? c) Draw 3 variable k-map d) Draw symbol for x-or gate e) Give truth table of or gate f) What is PAL and PLA g) Define prime implicant terms h) What is decoder | |
| Q.2 | <ul style="list-style-type: none"> a) Explain logic gates in detail b) Minimize following expression using k-map and realize the same using NAND gate only
 $Y (A, B C D) = \sum m (1, 4, 5, 6, 9, 12, 13, 14,) + \sum d (8,10,11)$ | 07
08 |
| Q.3 | <ul style="list-style-type: none"> a) Draw and explain 10 bit even parity generator b) Minimize following logic expression using quine mc- cluskey method
 $F (A, B, C, D) = \sum m (0,1, 2, 3, 5, 7, 8, 9, 11, 14)$ | 07
08 |
| Q.4 | <ul style="list-style-type: none"> a) Design 32:1 MUX using 8:1 MUX b) Explain characteristics of digital ICs | 07
08 |
| Q.5 | <ul style="list-style-type: none"> a) Realize following using 4 to 16 line decoder
 $f_1 = \sum m (0,3, 5, 6, 10, 11, 12)$
 $f_2 = \sum m (1, 2, 7, 13, 14, 15)$
 $f_3 = \sum m (2, 6, 10, 12, 13, 14)$ b) Compare combinational logic ckt with sequential logic ckt . | 08

07 |

Section B

- | | | |
|-----|--|----|
| Q.6 | Solve any five question (each for marks 2) | 10 |
| | <ul style="list-style-type: none"> a) Draw 4 bit PIPO shift register b) Draw logic symbol of D flip – flop c) Enlist types of shift register d) What are the applications of DAC? e) How many flip – flops are needed to design MOD 9 counter ? f) Give truth table of T flip – flop g) What us ring counter ? h) What are the types of ADC? | |

- Q.7 a) draw and explain Johnson Ring counter 07
b) Explain implementation of 3 bit R-2R binary ladder . 08
- Q.8 a) Explain single slop ADC 07
b) Design 4 bit synchronous counter using D type flf 08
- Q.9 a) Convent S-R flf to D type flf and convent T f|f to D type f|f 08
b) Draw and explain SISO right shift register 07
- Q.10 a) Design 3 bit parallel comparator ADC 07
b) Explain UP- down counter 08

SUBJECT CODE NO:- P-220
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E. (All Branches) Examination May/June 2017
Engineering Mathematics -IV
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 from and Q.No.6 are compulsory.
 - ii) Solve any two questions from remaining of each section.
 - iii) Figures to the right indicate full marks.
 - iv) Assume suitable data, if necessary.

Section A

Q.1 Solve any five from the following:

10

- a. Find the analytic function whose imaginary part is $e^x \sin y$.
- b. Show that $u = \bar{e}^\theta \cos(\log r)$ is harmonic.
- c. Find the image of the line $y=2x$, under the transformation $W=Z^2$
- d. Evaluate $\int_0^{1+i} (x^2 - iy) dz$ along the line $y=x$.
- e. Evaluate $\int_c \frac{e^z}{z} dz$, where c is $|z|=1$
- f. Find the poles of the function and the corresponding residues at each pole of $f(z) = \frac{ze^z}{(z+1)^3}$
- g. Solve $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, where $u(x, 0) = 6e^{-3x}$.

OR

Find the Z-transform of $f(k) = k, k \geq 0$.

h. Solve $\frac{\partial^2 z}{\partial x \partial y} = \sin x$.

OR

Find the Z-transform of $e^{-ak}, k \geq 0$,

Q.2 a. Show that the function $f(z) = e^{-x}(\cos y + i \sin y)$ is analytic and find its derivative.

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b. Find the bilinear transformation which maps the point $z = -1, 0, 1$ onto the points $W = 0, i, 3i$.

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c. Find the Z-transform of $\frac{\cos 2k}{k}, k \geq 0$.

05

OR

Solve $\frac{\partial^2 y}{\partial t^2} = C^2 \frac{\partial^2 y}{\partial x^2}$, subject to the conditions

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$Y(0, t) = 0, Y(l, t) = 0, \frac{\partial y}{\partial t} = 0$ at $t = 0$

And $y(x, 0) = \frac{3a}{2l}x, 0 \leq x \leq \frac{2l}{3}$

$= \frac{3a}{l}(l-x), \frac{2l}{3} \leq x \leq l$.

Q.3 a. Find k such that $f(x, y) = x^3 + 3kxy^2$ may be harmonic and find its conjugate harmonic function.

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b. Evaluate $\int_c \bar{z}^2 dz$, Where c is $|Z - 1| = 1$.

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c. Find the inverse Z-transform of $\frac{Z}{(z-2)(z-3)}, |Z| > 3$.

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OR

Solve $\frac{\partial u}{\partial t} = \alpha^2 \frac{\partial^2 u}{\partial x^2}$ for $0 < x < \pi, t > 0$

$\frac{\partial u}{\partial x} = 0$ at $x=0$, $\frac{\partial u}{\partial x} = 0$ at $x = \pi$ and $u(x, 0) = \sin x$.

Q.4 a. Expand $f(z) = \frac{1}{(z+1)(z+2)}$ for $0 < |z - 1| < 1$.

b. Evaluate $\oint_c \frac{\sin z}{(z-1)^2(z^2-9)} dz$, where c is $|z - 3| = \frac{1}{2}$. By Cauchy's integral formula.

c. Solve the difference equation by Z-transform $u_{k+2} - 2u_{k+1} + u_k = 2^k$, with $Y_0 = 2, Y_1 = 1$.

OR

Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$, subject to the conditions

$u(0, y) = u(\pi, y) = 0$ for all $y \geq 0$ and $u(x, 0) = 100 u(x, \infty) = 0$.

Q.5 a. Under the transformation $W = Z + \frac{a^2}{z}$, show that the map of the circle $x^2 + y^2 = a^2$ is a straight line, but the map of the circle $x^2 + y^2 = b^2$ ($b > a$) is an ellipse.

b. Evaluate $\oint_c \frac{z^2}{\sin^3 z \cos z} dz$, where c is $|z + i| = 2$ by Cauchy's Residue theorem.

c. Evaluate $\int_{-\pi}^{\pi} \frac{1}{1 + \sin^2 \theta} d\theta$, by using Residue theorem.

Section-B

Q.6 Solve any five from the following:

a. Find Laplace transform of $te^{-2t} \delta(t - 2)$.

b. Find $L[f(t)]$ and $L[f'(t)]$ of the following function $f(t) = 3, 0 \leq t < 5$
 $= 0, t > 5$.

c. Find the Laplace transform of $f(t) = (t-2)^2, t > 2$
 $= 0, t < 2$

d. Find inverse Laplace transform of $\frac{2s+2}{s^2+2s+10}$

e. Find inverse Laplace transform of $\frac{e^{-\pi s}}{s^2+9}$

f. Find inverse Laplace transform of $s^{-\frac{7}{2}}$

g. Find the Fourier cosine transform of $f(x) = k, 0 < x < a$
 $= 0, x > a$

h. Find the Fourier transform of $f(x) = x, 0 < x < a$
 $= 0, \text{ otherwise}$

Q.7 a. Find the Laplace transform of $\int_0^t \frac{1+e^t}{t} dt$.

b. Find the inverse Laplace transform of $\tan^{-1} \frac{2}{s}$

c. Using Fourier transform, solve the equation $\frac{\partial u}{\partial t} = 2 \frac{\partial^2 u}{\partial x^2}, 0 < x < \infty, t > 0$

Subject to the conditions

$u(0, t) = 0, t > 0, u(x, 0) = e^{-x}, x > 0,$

u and $\frac{\partial u}{\partial x} \rightarrow 0$ as $x \rightarrow \infty$.

Q.8 A. Evaluate $\int_0^{\infty} e^{-5t} \sinh^3 t dt$

b. Find the inverse Laplace transform by convolution theorem of $\frac{1}{s(s^2+4)}$

c. Find $f(x)$ satisfying the integral equation $\int_0^{\infty} f(x) \sin \lambda x dx = \frac{\sin \lambda}{\lambda}$

Q.9 Express the following function in terms of Heaviside unit step function and hence find their Laplace transform

$F(x) = \sin t, 0 < t < \pi$

$= t, t > \pi$

b. Solve $y'' - 6y' + 9y = t^2 e^{3t}$, $y(0)=2$, $y'(0)=6$ by Laplace transform.

c. Find the Fourier sine transform of

$$f(x) = \begin{cases} x, & 0 < x < 1 \\ 2-x, & 1 < x < 2 \\ 0, & x > 2 \end{cases}$$

Q.10 a. Find the Laplace transform of $f(t) = e^t$, $0 < t < 2\pi$, $f(t) = f(t+2\pi)$.

b. Solve $\frac{dx}{dt} + y = \sin t$, $\frac{dy}{dt} + x = \cos t$, $X(0)=2$, $Y(0)=0$ by Laplace transform.

c. Find the Fourier transform of $f(x) = \frac{1}{2a}$, if $|x| \leq a$
 $= 0$, if $|x| > a$.

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SUBJECT CODE NO:- P-246
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E. (CSE/IT) Examination May/June 2017
Microprocessors
(Revised)

[Time:ThreeHours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and Q.No.6 are compulsory.
 - ii) Attempt any two questions from Q. No. 2 to Q. No.5 and any two questions from Q.no.7 to Q. No.10.
 - iii) Figure to the right indicated full marks.

Section A

- Q.1 Attempt any five 10
- a. What is the function of BP and sp registers.
 - b. Draw memory map of TPA in personal computer system.
 - c. List the memory sizes for 8086 to Pentium microprocessor.
 - d. Write function of direction and overflow flag of 8086 microprocessor.
 - e. What is real mode memory addressing?
 - f. Which are the four memory segments of 8086 microprocessors? Give their functions.
 - g. What is the difference between physical and logical address.
 - h. Identify addressing mode of following.
 - i. MOV DX,AX
 - ii. MOV AL, [BP+DI]
 - iii. MOV AL, [DI]
 - iv. MOV AL,[DI+1000H]
- Q.2 a. Explain internal block diagram of 8086 microprocessor. 08
 b. what are addressing modes? Explain data addressing modes. 07
- Q.3 a. Explain miscellaneous data transfer instruction 08
 i. XCHG ii. SAHF iii. LAHF iv. XLAT
 B. Write a assembly language program to find average of 10 elements. 07
- Q.4 a. Explain following instruction in detail with examples. 08
 i. DAA
 ii. AAA
 b. Explain logical instructions of 8086. 07
- Q.5 a. Explain working of stacks. Also explain PUSH and POP instructions with example. 07
 B. Write an assembly language program to find smallest element from an array of 10 elements. 08

Section B

- Q.6 Attempt any five. 10
- A. What is the function of chip select pin of 8255?
 - b. What is the function of QSO and QSI pin of 8086?
 - c. What is the difference between SRAM and DRAM?
 - d. Draw simplified diagram for read bus cycle of 8086 microprocessor
 - e. Explain function of following pins.
 - i. TEST
 - ii. ADO-AD15
 - f. Write the difference between hardware and software interrupt.
 - g. Why is it required to refresh DRAM.?
 - h. Write difference between fixed port and variable post address in IN & out instructions
- Q.7 a. Explain 8055 PPI with suitable diagram 07
 b. Explain different modes of operation for 8254 timer. 08
- Q.8 a. Explain ready and wait state, with suitable diagram. explain how to insert wait states in bus cycle of 8086 microprocessor. 08
 b. Differentiate between minimum mode and maximum mode of 8086 07

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- Q.9 a. What is address decoding? Why address decoding is necessary? Explain with suitable example. 07
- b. What is the use of interrupt vectors and vector table .And explain the location of vector table. 08
- Q.10 a. Explain control word register of 8255 PPI 08
- b. Explain maskable interrupts and non- maskable interrupts of 8086 microprocessors. 07

SUBJECT CODE NO:- P-277
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E. (CSE/IT) Examination May/June 2017
Computer Graphics
(Revised)

[Time: Three Hours]

[Max.Marks:80]

- N.B
- Please check whether you have got the right question paper.
- Question No. 1 & 6 are compulsory.
 - Attempt any two questions from Question No.2 to Question No.5 and from Question No.7 to Question No.10

Section A

- Q.1 Attempt any Five 10
- i) What is animation?
 - ii) What is resolution?
 - iii) List uses of computer Graphics?
 - iv) Distinguish between convex and concave polygons?
 - v) Explain glut keyboard Func()
 - vi) Define fractals
 - vii) List different OpenGL Basic primitives
- Q.2 a) A Polygon has four vertices located at A (20,10), B (60,10), C (60, 30), D (20, 30). Calculate the vertices after applying a transformation matrix to double the size of polygon 08
- b) What are the major components of graphics pipeline and how do they interact? 07
- Q.3 a) Write an OpenGL program to draw hexagon using basic primitive 08
- b) Explain Synthetic Camera Model for imaging system 07
- Q.4 a) Obtain a transformation matrix for rotation 08
- b) Write an OpenGL program to display small triangle whenever left mouse button is clicked 07
- Q.5 a) What do you mean by display lists? Give suitable example along with its advantages. 08
- b) Explain primary colors used in RGB color model & explain how other colors are achieved? 07

Section B

- Q.6 Attempt any Five 10
- i) How will you clip a point?
 - ii) Define rendering
 - iii) What is Center of projection?
 - iv) What is composite transformation?
 - v) What is axonometric projection?
 - vi) What are properties of light?
 - vii) What is raster scan system?

- Q.7 a) Digitize a line from (10, 12) to (15, 15) using DDA line algorithm 08
b) Differentiate between parallel and perspective projection? 07
- Q.8 a) Explain classification of visible surface detection methods. Explain each with suitable example 08
b) How window to viewport coordinate transformation happens? 07
- Q.9 a) Write about Cohen-Sutherland's line clipping algorithm. 08
b) How OpenGL supports interaction with windows system using functions 07
glutCreateWindow()
glutInitWindowSize()
glutInitWindowPosition() ?
Explain each function in detail
- Q.10 a) Explain about shading models 08
b) Explain in detail ambient, diffuse and specular reflection. Discuss how the angle of reflection is 07
calculated

SUBJECT CODE NO:- P-309
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E. (CSE/IT) Examination May/June 2017
Discrete Mathematics
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
1. Q 1 from section A and Q.6 from the section B are compulsory
 2. Solve any two questions from remaining in each section.
 3. Draw diagram and graphs wherever required.
 4. Figure to the right indicate full marks

Section A

Q.1 Attempt any five 10

1. What is set and explain associate law of the sets
2. What is power set and determine the power set $P(A)$ of the set $A = \{ 3, 2, \emptyset \}$
3. Let $A = \{ \emptyset, q \}$ construct the following sets
 - a) $\{ \emptyset \} - A$
 - b) $A \cap P(A)$
4. Explain countable & uncountable sets
5. Which of the following proposition are true and which are false
 - a) If the earth is round then earth travels around the sun
 - b) If tiger have wings, the RDX is dangerous
6. How to test the logical equivalences of two propositions
7. Prove that the proposition $p \cap (q \cap \sim p)$ is a contradiction

8. what is quantifiers give example

Q.2 a) To prove $A \cup (\bar{B} \cap C) = (A \cup \bar{B}) \cap (A \cup C)$ using venn diagram 07

- b) A card is drawn at random from a well shuffled pack of 52 cards find probability of getting 08
- i) a jack , a queen and a king
 - ii) a two of heart or two of diamond

- Q.3 a) Explain negations of compound statement with example 07
 b) prove by mathematical induction 08

$$\frac{1}{1.3} + \frac{1}{3.5} + \frac{1}{5.7} + \dots + \frac{1}{(2n-1)(2n+1)} = \frac{n}{2n+1}$$

- Q.4 Show that 07
 $\exists y \forall x p(x, y) \Rightarrow \forall x \exists y p(x, y)$

- B) Determine whether the conclusion t is valid conclusion in the following premises 08
 $p \Rightarrow q, \quad q \Rightarrow r, \quad r \Rightarrow s, \quad \sim s$ and $p \vee t$

- Q.5 a) What is conditional proposition or implication write converse, contra positive and inverse of implication of following statement 07
 p: It rains
 q: the crop will grow

- b) Rewrite the following argument using quantifier, variable and predicate symbol 08
 i) If a number is odd, then its square is odd
 ii) All healthy people eat an apple a day
 iii) Ram is not a healthy person
 iv) K^2 is odd

Section B

- Q.6 Attempt any five 10

1) let R be a relation on set $A = \{1, 2, 3, 4\}$
 Defined by $R = \{(1,1), (2,2), (3,3), (4,4), (4,3), (4,2), (4,1), (3,2), (3,1)\}$
 Find the zero- one matrix and directed group of relation R

- 2) What is equivalence classes
 3) Explain Cartesian product of three sets
 4) If $A = \{2,3,4\}$ and $B = \{5,6\}$ determine all function from A to B
 5) Find the hamming weight of the given words
 a) 1001101
 b) 1110011
 6) Define parity- check code
 7) Define normal subgroup and Abelian group
 8) Define integral domain and field

Q.7 a) Define chain and Antichain explain with example 07
 b) Consider the function $f, g: \mathbb{R} \rightarrow \mathbb{R}$ 08
 defined by $f(x) = x^2 + 3x + 1$, $g(x) = 2x - 3$
 find the composition function
 i) $f \circ f$
 ii) $f \circ g$
 iii) $g \circ f$
 iv) $g \circ g$

Q.8 a) Explain pigeonhole principle and show that if 10 colors are used to paint 101 building then atleast 11 building have the same color 07
 b) let $A = \{1,2,3,4,5,12,15,25\}$ & R be the binary relation on set A such that $R = \{(a,b) / a \text{ divides } b\}$ 08
 show that R is partial order relation & hence draw hasse diagram of the relation

Q.9 a) Let $(A,*)$ be a semigroup, for every a and b in A , if $a \neq b$ then $a * b \neq b * a$ 08
 1) show that for every a in A , $a * a = a$
 2. show that for every a, b in A , $a * b * a = a$
 3. show that for every a,b,c in A , $a * b * c = a$

b) Consider a ring $(R, +, \cdot)$ defined by $a * a = a$, determine whether the ring is commutative or not 07

Q.10 a) What is hamming distances explain with example 07
 b) Let 08

1	1	0	0	0	0
0	1	1	0	1	0
0	0	1	0	0	1

This is parity check matrix for a 6 bit linear code
 The word 111001 and 101011 are received. Use the matrix to decide whether or not the words are likely to have been correctly transmitted.

SUBJECT CODE NO:- P-374
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E. (CSE/IT) Examination May/June 2017
Object Oriented Programming Using C++
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B i) Q.No.1 and Q.No.6 are compulsory.
ii) Solve any two from each section

Section A

- Q.1 Solve the five 2*5=10
- a. What is the use of scope resolution operator (::) in C++?
 - b. What are the operators of C++ that cannot be overloaded?
 - c. How does constructor differ from normal functions?
 - d. What is the default access mode for class members?
 - e. What do you mean by cascading of I/O operators?
 - f. What is the structure of C++ program?
 - g. What will be the output of the following code?
For(int m=0; m<5; m++)
Cout << m;
 - h. what does the following poop prints out?
int m=1;
While(m<11)
{
m++;
cout<<m++;
}
- Q.2 a. Define a class STRING. Overload + operator to concatenate two strings. 08
b. Write a C++ program to create a class circle having data members radius, member functions to 07
i) read radius, ii) to calculate & display area iii) to calculate & display circumference. Create two objects of class.
- Q.3 Explain object-oriented paradigm with all its essential elements 15
- Q.4 a. What is friend function? Explain with example. 08
b. Explain function overloading with programming example. 07
- Q.5 Explain the type conversions in C++, with example. 15
- Section B
- Q.6 Solve any five 2*5=10
- a. What is an I/O stream
 - b. what is the type of class for which objects cannot be created?
 - c. How to open and close file?
 - d. What is generic classes in templates?
 - e. What is "this"
 - f. What is container?
 - g. What is the difference between private and protected class members?
 - h. What do you mean by function? What is the prototype of function?

- Q.7 a. What do you mean inheritance & containership in C++? Explain 08
 b. What is stream manipulators? Discuss setw(), setfill(), setprecision() 07
- Q.8 a. What is file mode? Discuss the various file mode options available in C++ 08
 b. What is polymorphism? What are the advantage of using it? Differentiate between compile time & runtime polymorphism with example. 07
- Q.9 a. Explain throwing & Catching mechanism. 08
 b. What do you mean by abstract class? Explain with example. 07
- Q.10 Write a program to create a class STUDENT having data member roll no. Create classes TEST & SPORTS from class student having data member marks of two test & sports score respectively. All three classes contain functions. i) to set values of data members ii) to display values of data members. 15
 Create class RESULT from Class test & sport having data member total & member function to calculate total, display all information of student. Create one object of class result & call proper functions.