

MCA - II (old) 26/5/14

CG.

QP Code : FR-10259

(3 Hours)

[ Total Marks :100

- N.B.**
- (1) Question no. 1 is **compulsory**.
  - (2) Solve any **four** from the **remaining**.
  - (3) Use of non programmable **calculator** is **allowed**.
  - (4) **Mixing** of sub questions is **not allowed**.
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1. (a) Derive and write the Generalized Bresenham's line drawing algorithm. 10  
(b) What are Display Files? Explain with examples, how are polygons and characters represented in display file. 10
  
  2. (a) Discuss various colour models used in graphics system. 10  
(b) Find out the final co-ordinates of a figure bounded by the co-ordinates ( 1, 1 ), (3,4), (5,7), (10,3) when rotated about a point (8,8) by  $30^\circ$  in clockwise direction and scaled by two units in x-direction and three units in y-direction. 10
  
  3. (a) What are projections? How are they useful? Explain different types of projections with examples. 10  
(b) Construct the Bezier curve of order three and with four polygon vertices A(1, 1 ), B(2,3), C(4,3) and D(6,4). 10
  
  4. (a) Explain the Cohen Sutherland line clipping algorithm with the help of an example. 10  
(b) Rasterise the ellipse having  $r_x=8$  and  $r_y=6$  in first quadrant. 10
  
  5. (a) Explain and write the Z buffer Algorithm along with its advantages and disadvantages. 10  
(b) Find a normalization transformation from the window whose lower left corner is at (1,1) and upper right corner is at (3,5) onto the viewport with lower left corner at (0,0) and upper right corner at (1/2, 1/2). 10
  
  6. (a) Apply the shearing transformation to square with A(0,0), B(1,0), C(1,1), D(0,1) as given below- 10
    - (i) Shear parameter value of 0.5 relative to the line  $Y_{ref} = -1$
    - (ii) Shear parameter value of 0.5 relative to the line  $X_{ref} = -1$
  - (b) Compare and contrast B-Spline and Bezier curves. 10
  
  7. Write short note **any four** of the following :- 20
    - (a) Diffuse Illumination
    - (b) Computer Animation
    - (c) Inverse Transformations
    - (d) Frame Buffer
    - (e) DVST

MCA sem II <sup>old.</sup> May 2014  
Sub- DS 22105114  
(3 Hours)

QP Code : FR-10257  
[Total Marks : 100

N.B (1) Question 1 is compulsory

(2) Solve any FOUR questions from remaining SIX questions.

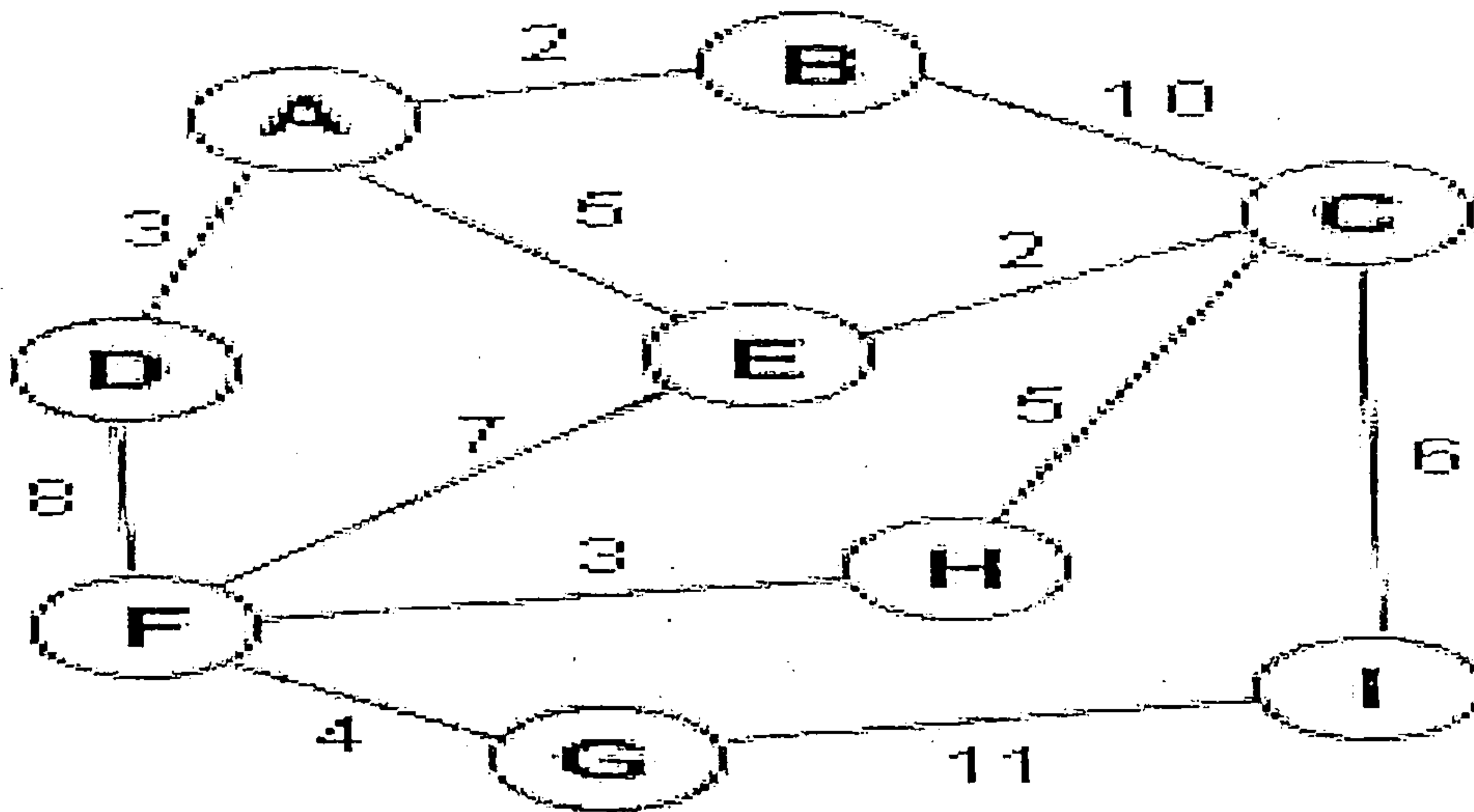
1. (a) What are asymptotic notation? Explain all with suitable diagram 10  
(b) Differentiate between 10  
i) Tree and Graph  
ii) Depth –First – Search and Breadth – First – Search
2. (a) Define and explain Stack with example. Give algorithm for PUSH, POP, Stack Full and Stack Empty Functions. 10  
(b) What is AVL Tree? Explain AVL Tree operations with example. 10
3. (a) A Binary tree has following In order and Pre Order traversal . 10  
In Order Traversal : A B C E D F J G I H  
Pre Order traversal : J C B A D E F I G H  
Show the step wise reconstruction of tree along with Post Order traversal.
- (b) Write an algorithm for 10  
i) To Delete a particular node in doubly Link List  
ii) To Count the number of nodes in Single Link List
4. (a) What is Sorting? List the Sorting technique and explain any two with example. 10  
(b) Explain Huffman Coding for given Symbol and there Frequency 10
- |           |     |   |   |   |   |   |    |   |   |
|-----------|-----|---|---|---|---|---|----|---|---|
| Symbol    | : A | B | C | D | E | F | G  | H | I |
| Frequency | : 7 | 6 | 4 | 6 | 5 | 1 | 10 | 7 | 3 |
5. (a) Define Queue. Write an algorithm to Insert element and Delete element form circular queue. 10  
(b) Define Expression tree .Draw the expression tree and find prefix and postfix expression 10  
for given Infix expression. Expression : (S+P)\*(Z-W+D/X)

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6 (a) Give Minimum Spanning tree using kruskal's and prim's Algorithm for the graph shown bellow.

10



(b) What is B Tree. Explain process to build B tree by inserting element

10

7. Write a short note on ( any FOUR )

20

- a) Hashing Technique.
- b) Doubly Link List.
- c) Dijkstra Algorithm.
- d) B \* Tree.
- e) M way Tree.

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MCA SEM II (old) P & S 30/5/2014

QP Code : FR-10266

( 3 Hours )

[ Total Marks : 100

- N.B.:** (1) Question No.1 is **compulsory** and carries **20** marks.  
(2) Attempt any **four** out of remaining **six** questions  
(3) Assume any **necessary** data but justify the **same**.  
(4) **Figures** to the **right** indicate marks.  
(5) Use of **calculator** is **allowed**.

1. (a) Prove with example that three events may be pair-wise independent but need not be mutually independent. 5  
(b) The contents of urns I, II and III are as follows: 1 white, 2 black and 3 red balls, 2 white, 1 black and 1 red balls and 4 white, 5 black and 3 red balls. One urn is chosen at random and two balls are drawn. They happen to be white and red. What is the probability that they come from I ? 5  
(c) Prove that Poisson distribution is a limiting case of Binomial distribution. 10  
Suppose a book of 585 pages contains 43 pages with misprints. If these pages are randomly distributed throughout the book, what is the probability that 10 pages, selected at random, will be free from pages with misprint? (Given  $e^{-0.375} = 0.4795$ ).
2. (a) The joint density function of the two dimensional random variable (X, Y) is given 10  
by  $f_{xy}(x, y) = x^3 y^3 / 16, 0 \leq x \leq 2, 0 \leq y \leq 2$   
 $= 0$  otherwise.  
Find the marginal densities of X and Y. Also find the cumulative distribution functions of X and Y.  
(b) (i) n persons are seated on n chairs at a round table. Find the probability that two specific persons are sitting next to each other. 5  
(ii) A consignment of 15 record players contains 4 defectives. The record players are selected at random, one by one, and examined. Those examined are not put back. What is the probability that the 9th one examined is the last defective ? 5
3. (a) (i) Show that exponential distribution is memory less. 5  
(ii) If  $P(x) = x / 15; x = 1, 2, 3, 4, 5$  5  
 $= 0; \text{ otherwise}$   
Find  $P \{ 1/2 < X < 5/2 \mid X > 1 \}$ .  
(b) Prove that mean, mode and median of a normal distribution coincides. 10
4. (a) (i) The life of army shoes is normally distributed with mean 8 months and standard deviation 2 months. If 5000 pairs are issue how many pairs would be expect to need after 12 months? [Given that  $P(z \geq 2) = 0.0228$ ]. 5  
(ii) Prove that  $\Gamma(n) = (n - 1)!$  5

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Con. 9154-14.

- (b) (i) A continuous random variable has pdf 5  
 $f(x) = k(2 - x), 0 \leq x < 2$   
 $= kx(x - 2), 2 \leq x < 3$   
 $= 0, \text{ otherwise.}$   
 Find k.
- (ii) X and Y are two random variables having joint density function  $f(x, y) = (2x + y) / 27$ , 5  
 where x and y can assume only integer values 0, 1 and 2. Find the conditional distribution of Y for  $X = x$ .
5. (a) (i) In the frequency distribution of 229 families given below, the number, of families 5  
 corresponding to expenditure groups 30-40 and 50-60 are missing. The median is known to be 46. Find the missing frequency.

Expenditure (in Rs.)	No. of Families
10-20	12
20-30	30
30-40	?
40-50	65
50-60	?
60-70	25
70-80	18

- (ii) The ranks obtained by ten students in DS and PS are given below :- 5

Ranks in DS	9	10	6	5	7	2	4	8	1	3
Ranks in PS	1	2	3	4	5	6	7	8	9	10

Compute their ranks in the two subjects and the coefficient of correlation of ranks.

- (b) Obtain the equation of regression line for the following values of x and y 10

X	1	3	4	6	8	9	11	14
Y	1	2	4	4	5	7	8	9

6. (a) (i) For the 2 X 2 table : 5

a	b
c	d

$$\chi^2 = N(ad - bc)^2 / [(a + c)(b + d)(a + b)(c + d)], N = a + b + c + d.$$

- (ii) Sample survey was taken to check which newspaper people read (A, B, C). 5  
 20% read A, 16% read B, 14% read C, 5% read A and C, 8% read A and B,  
 4% read B and C, 2% read A, B and C. If a person is selected at random, find  
 what percentage read at least one of the newspaper.
- (b) In a small town bank containing only one cash counter 12 customer arrive on an 10  
 average every 10 minutes. While the cashier can serve 10 customer in 5 minutes.  
 Assuming Poisson's distribution for arrival rate and exponential distribution for service  
 rate find –
- Average number of customers in the system.
  - Average time a customer spends in the system.
  - Average number of customers in the queue or average queue length.
  - Average time a customer waits before being served.
7. (a) A man with  $n$  keys wants to open his door and tries the keys independently and 10  
 at random.  
 Find the mean and variance of the number of trials required to open the door a) if  
 unsuccessful keys are not eliminated from further selection b) if unsuccessful keys  
 are eliminated from further selection.
- (b) Calculate the Karl Pearson's correlation coefficient for the following :– 10

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

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MCA - Sem - II - (Old) - Communication & Soft Skills  
MAY - JUNE 2014 QP Code : FR-10271

(3 Hours)

[Total Marks : 100

N.B: (1) Question No. 1 is compulsory.

(2) Attempt any four (4) questions of the remaining six (6) questions.

(3) Answers to the questions should be grouped and written together.

(4) Figures on the right indicate full marks assigned to the question.

1. A) "Communication is a Two-Way process". Substantiate this statement, indicating clearly the role of each constituent element. 10
- B) What are cross-cultural barriers to communication? Explain methods of overcoming them. 10
2. A) Draft the notice with agenda for a meeting of the Sports Committee of your college called to plan the Annual Sports Meet to be organized in your college. 10
- B) Write the minutes of the above meeting. 10
3. A) How important is body language in an interview? 10
- B) Your friend is appearing for the GD in the recruitment process of a company. What will you advise him/her regarding the Dos and Don'ts of a GD? 10
4. A) Explain the concept of vertically upward /downward communication with appropriate examples. 10
- B) What is paralanguage? How does it affect the meaning and impact of speech? 10
5. A) As the Business Development Manager of E-Ware Solutions, write a sales letter to prospective clients offering them your services for designing and hosting their web sites. 10
- B) As the Marketing Manager of an IT company, you have received a complaint regarding the software solution you provided to a school in Mumbai. Write a letter to the Principal of the school appologising for the inconvenience caused and offering to remedy the situation. 10
6. A) Explain Time management. What is its significance in an IT firm? 10
- B) Explain grapevine communication, and its importance in an organization. 10
7. Write short notes on (any 4) 20
- Assertiveness
  - Motivation
  - Team work
  - Decision Making
  - Goal Setting