DDCE - IV - S - MCA / II - S - (LE) /

II - S - M.Sc. - (CS, IT & ITM) - CS - 4.1 - (SE)

2018

Full Marks - 70

Time - As in the Programme

The figure in the right hand margine indicate marks.

Answer ALL questions.

1. Answer All questions. [2×5

(a) What is software engineering ? Why do we need it ?

(b) Give the format of SRS document.

(c) Why do we use VORD ?

(d) Which process model is a meta model and why ?

(e) Draw a use case diagram of tic-tac-toe game.

2. Answer any THREE questions : [8×3

(a) What is requirement elicitation and analysis ? Outline the functional requirements of a bank acc. to SRS document.

[Cont...

(b) Compare water-fall and spiral process models. Give some examples of applications for the same.

(c) Considering a library information system cite all the possible system requirements.

(d) What is architectural design ? Focus on important control models that you know.

(e) Why do we need system models ? Draw a DFD upto 1st level of a hostel mess system.

(f) Why do we do system structuring ? Give an illustration of a behavioural model of an order processing.

(g) Compare ISO 9000 and CMM level - 5.

3. Answer any THREE questions : [12×3

(a) What are the different dimensions of a dependable system ?

Indentify 6 consumer products which may contain in future safety critical s/w systems.

(b) What are the potential error-prone constructs in programming languages.

[Cont...

(c) Outline the reliability metrices.

Draw a fault tree analysis of a insulin delivery by a robot in a hospital for a diabetic patient ?

(d) Focus on each approach to conduct white-box testing.

(e) What is the importance of CFG ? Find the CFG of bubble-sort.

(f) Why do we conduct software configuration management ? Briefly describe the change and version management.

(g) Briefly narrate the process for COCOMO to calculate development effort for a college library s/w system. (Take 5 cost drivers of your choice with justifiable values)

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DDCE - IV - S - MCA / II - S - (LE) /
II - S - M.Sc. - (CS, IT & ITM) - CS - 4.1 - (SE)

DDCE - IV - S - MCA / II - S - (LE) /
II - S - M.Sc. - (CS, IT & ITM) - CS - 4.2 - (AI)

2018

Full Marks - 70

Time - As in the Programme

The figure in the right hand margine indicate marks.

Answer ALL questions.

1. Answer All questions. [2×5

(a) Outline the applications of Artificial Intelligence.

(b) Represent the declarative sentence in propositional Logic.

(i) Ram likes his dog.

(ii) Ram likes all dogs.

(c) Represent the sentence in first order logic. All persons comfortable to speak in mother tong.

(d) Is Context Free Grammar is Type - 1 Grammar ?

(e) What do you mean by Artificial Neural Network.

[Cont..

2. Answer any THREE questions : [8×3

(a) Write Uniform cost search algorithm and find its time and space complexity.

(b) Solve the given cryptarithmatic problem.

```
  SEND          ONE
 +MORE    OR   +ONE
------        ------
 MONEY         TWO
```

(c) Describe the supervised and unsupervised learning with example.

(d) CFG grammar

<s> → <NP><VP>

<NP> → <CN> | <CN><PP>

<VP> → <CV> | <CV><PP>

<PP> → <PREP><CN>

<CN> → <ART><N>

[Cont...

<CN> → <ART><ADJ><N>

<CV> → <V> | <V><NP>

<ART> → a | the

<N> → peacock | bird

<V> → is

<ADJ> → beautiful

Using above grammar parse the sentence "the peacock is a beautiful bird".

(e) Explain the Water Jug problem with proper logical arguments.

3. Answer any THREE questions : [12×3

(a) Write A * algorithm and show that it is optimal or not.

(b) Construct the game tree for NIM game of match stick 6 and evaluate the value of node by minimax algorithm.

[Cont...

DDCE - IV - S - MCA / II-S (LE) / II-S-MSc

(CS, IT & ITM) - CS - 4.3 - (I & JP)

2018

Full Marks- 70

Time -As in the Programme

The figures in the right-hand margin indicate marks.

Answer ALL questions.

1. Answer all questions : [2×5=10

   (a) What is DOM ? What are the different levels of DOM ?

   (b) What is the role of XHTML ?

   (c) Define CORBA ?

   (d) What is the difference between Prepared Statement and Callable Statement in JDBC ?

   (e) What is Java Script ? What is different between Java Script and Java ?

2. Answer any THREE. [8×3=24

   (a) Mention list of commonly used containers while designed GUI using AWT and also any of the container with an example.

/ Cont...

(b) Write a Program to Demonstrate Mouse events.

(c) What is an Applet ? Describe its life cycle and explain it with a program.

(d) Write a program to validate a numeric input within (0 to 9) using Javascript.

(e) Write a note on Java Database Connectivity. Illustrate with an example.

3. Answer any THREE. [12×3=36

(a) What is Multithreading ? Explain yield (), wait () and sleep () methods. with example.

(b)(i) Write A RMI program to Design a Simple calculator. [8

(ii) Explain bind () and lookup () in RMI. [4

(c)(i) Discuss XML namespaces in detail. [6

(ii) Write a short note on cascading style sheet. [6

(d) Write a program to demonstrate how to create a JTree and a JTable using Java Swing API.

(e) Describe HTML form elements. demonstrate it using a student registration form.

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DDCE-IV-S-MCA / II-S (LE) / II-S-MSc

(CS, IT & ITM) - CS - 4.4 - (CG)

2018

Full Marks- 70

Time -As in the Programme

The figures in the right-hand margin indicate marks.
Answer ALL questions.

1. Answer all questions : [2×5=10

(a) Differentiate between raster scan and random scan.

(b) What do you mean by view point and how it is different from windowing ?

(c) What do you mean by aspect ratio ?

(d) Differentiate between diffuse reflection and specular reflection.

(e) What do you mean by back face culling ? Explain with an example.

[Cont...

2. Answer any THREE. [8×3=24

(a) Indicate which raster location will be chosen by Bresenham's algorithm. When scan converting a line from pixel coordinate (0,0) to pixel coordinate (5,5).

(b) What is Random Scan ? How it is different from other scanning mechanism used in Computer graphics ?

(c) Explain in detail the Cyrus Beck line-clipping algorithm with an example.

(d) Differentiate parallel and perspective projections and derive their projection matrices.

(e) Explain different techniques used for visible line determination ? How Z-buffer algorithm is helpful for it.

3. Answer any THREE. [12×3=36

(a) Write the expression for Bezier Curze ? Discuss its advantages and disadvantages.

(b) What do you mean by illumination ? Discuss different Illumination models with their advantages and disadvantages with example.

[Cont...

(c) What are the color models used in Computer Graphics ? Explain each one with a neat diagram.

(d) What is fractal ? Discuss different fractal standard models used in L system with a neat diagram.

(e) Triangle whose vertices are A (0,0), B(5, 1), and C(3,4). Rotate it by 90 degree at origin, at point (2,3).

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DDCE - IV - S - MCA / II - S (LE) / II - S-MSc

(CS, IT & ITM) - CS - 4.5 - (C &GT)

2018

Full Marks- 70

Time -As in the Programme

The figures in the right-hand margin indicate marks

Answer ALL questions

1. Answer all questions : [2×5

(a) How many binary string of length six having no two consecutive 0's.

(b) Find the height of the Binary Search Tree whose preorder walk is 15, 5, 3, 9, 7, 12, 25, 20, 65, 30, 50.

(c) Find the number of edge disjoint Hamiltonion circuits in a complete graph with n vertices where n is odd and $n \geq 3$.

[Cont...

(d) Find Chromatic number and chromatic polynomial of a free tree with n vertices.

(e) Find the different number of Deterministic Finite State Machine with two states and two symbols in alphabet.

2. Answer any three questions. [8×3

(a)(i) Prove that for connected graph is Euler if and only if graph G has all even degree vertex.

(ii) Prove that the number of vertices of odd degrees in a graph is always even.

(b)(i) Pvore that If G is a free tree then any two vertices in G are connected by a unique simple path.

(ii) Prove that If G is connected but if any edge is removed from E, the resulting graph is disconnected then G is connected and $|E| = |V| - 1$.

(c) (i) Find the chromatic polynomial and chromatic number of the given graph in figure 0.

[Cont....

(ii) Is graph G_1 and G_2 shown in figure 1 is isomorphic if yes show one to one mapping.

(d) (i) Represent the graph G sho on in figure 2 by adjacency matrix and adjacency linked list.

(ii) Perform a BFS traversal of graph g start from vertex a in Figure 2.

(e)(i) Count the integer divisible by 3 and 7 in 1 to 1000.

(ii) $p(n,0) = 1$ and $p(n,n) = n!$

$p(n,r) = r^* \; p(n-1,r-1) + p(n-1,r)$

Prove that the solution of the above recurrence relation is

$p(n,r) = n!/(n-r)$

3. Answer any three questions. [12×3

(a)(i) A simple graph with n vertices and K components can have at most $(n-1)(n-k+1)/2$ edges.

(ii) Find the cost of Minimum Spanning Tree in given weighted graph G shown in figure 3.

[Cont...

(b)(i) Prove that a connected planar graph with n vertices and e edges has (e-n+2) regions.

(ii) Find the variable length Huffman encoding of alphabets and its frequency.

A (3), b(8), c(4), d(5), e(10), f(15)

(c)(i) Find the maximum number of edges in a bipartite graph having total vertex n.

(ii) Find the vector sum of the two sub graph G_1 and G_2 of G shown in figure 4.

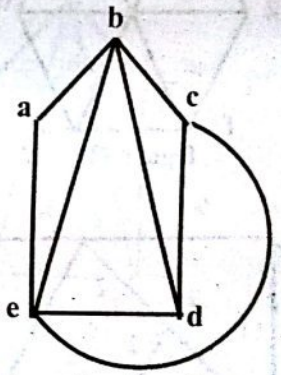
(d)(i) Prove that $C(n,r) = C(n, n-r)$

(ii) How many distinct ways to multiply n matrices. (matrix multiplication is associative not commutative).

(e)(i) Find the dual graph of the given planar graph shown in figure 5.

(ii) Find the partition of the given graph in figure 6 and find the chromatic number.

[Cont...



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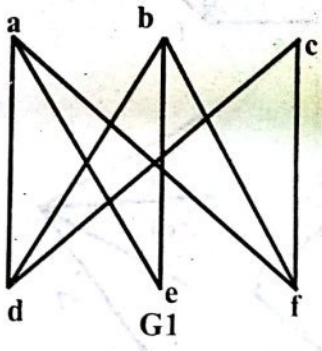

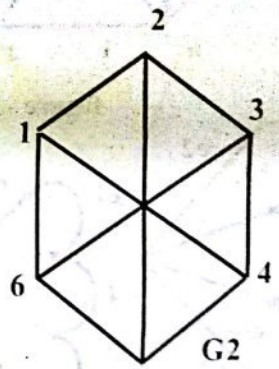

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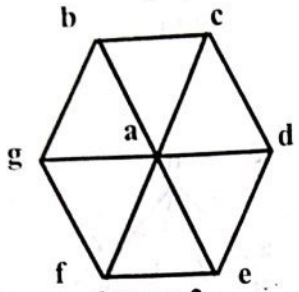

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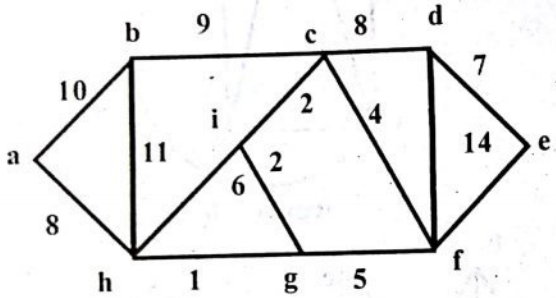

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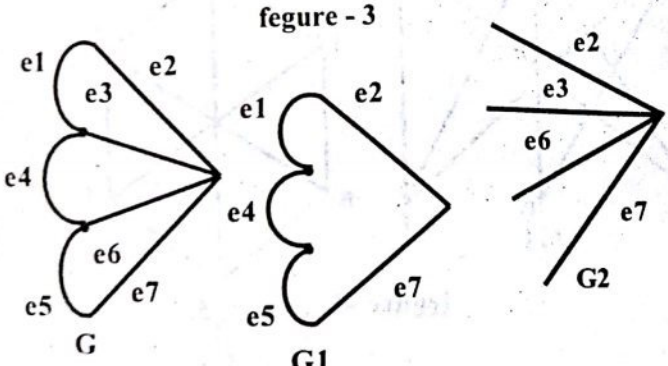

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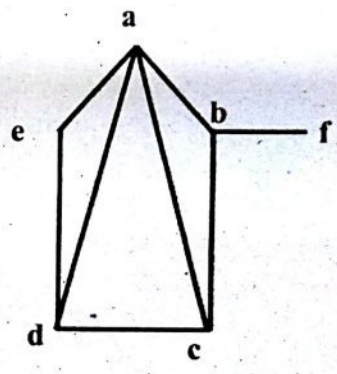

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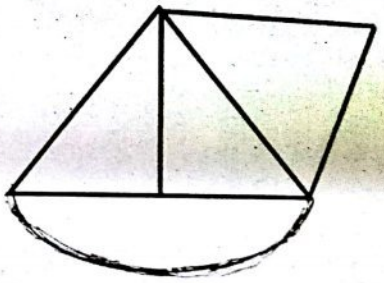

fegure - 6

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DDCE-IV-S-MCA / II-S (LE) / II-S-MSc

(CS, IT & ITM) - CS - 4.6 - (ACN)

2018

Full Marks- 70

Time -As in the Programme

The figures in the right-hand margin indicate marks.
Answer ALL questions.

1. Answer all questions : [2×5=10

   (a) What is Ad hoc networks Routing ?

   (b) What is Hierarchical Routing Flooding ?

   (c) Define TUNNELING ?

   (d) What is classful Addressing ?

   (e) What is Hierarchical Namespace ?

2. Answer any THREE. [8×3=24

   (a) Explain in details about Dynamic Host Control Protocol.

   (b) What is RPC ? Describe its working mechanism and its issues ?

   (c) Explain in detail about the Common Gateway Interface.

[Cont...

(d) Explain the process of Translation and implementation in a Network address.

(e) Why fragmentation is necessary ? Explain different fields related to Fragmentation in IPv4.

3. Answer any THREE. [12×3=36

(A) What are the different services provided by transport layer protocols ? Describe TCP briefly and compare it with UDP.

(B) What is congesting ? What are the factors that cause congestion ? Write the congestion control mechanisms.

(C)i. Differentiate between IPv4 address and IPv6 address. [6

ii. What is flow control in TCP ? Explain the working of Sliding Window Protocol. [6

(D)i. Explain different flow characteristics for QoS in Internetworking. [6

ii. Explain briefly the fields in user Datagram format with a neat diagram. [6

(E) Write short notes on any two :

- DNS
- FTP
- HTTP

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