[Printed Pages: 04]   Roll No. ....

B.Tech.(CSE)-IV Semester Examination - May, 2019 (Regular/ ATKT)
Data Structure
12CA404

Duration:- 3 Hours]   [Max. Marks:100

Instructions:
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The question paper is divided in two sections.
3. Attempt questions according to the instructions given with sections. Distribution of marks is given with sections.

Note:- Use mind map to answer the question.

(Section - 'A')   (8×5=40)

(Short Answer Type Questions)

Note: - Attempt all questions. Each question carries 08 marks.

Q.1.   Consider the following stack:-

STACK : L, B, R, P

Describe the stack as the following operation take place:-

(a) PUSH (STACK, A)

(b) PUSH (STACK, D)

(c) POP (STACK)

(d) POP (STACK)

(e) PUSH (STACK, M)

(f) POP (STACK)

(g) POP (STACK)

Or

Write a program to find factorial of a number using recursion?

Q.2.   Explain different types of linked list with proper diagram.

Or

Write an algorithm to display a double linked list in reverse order.
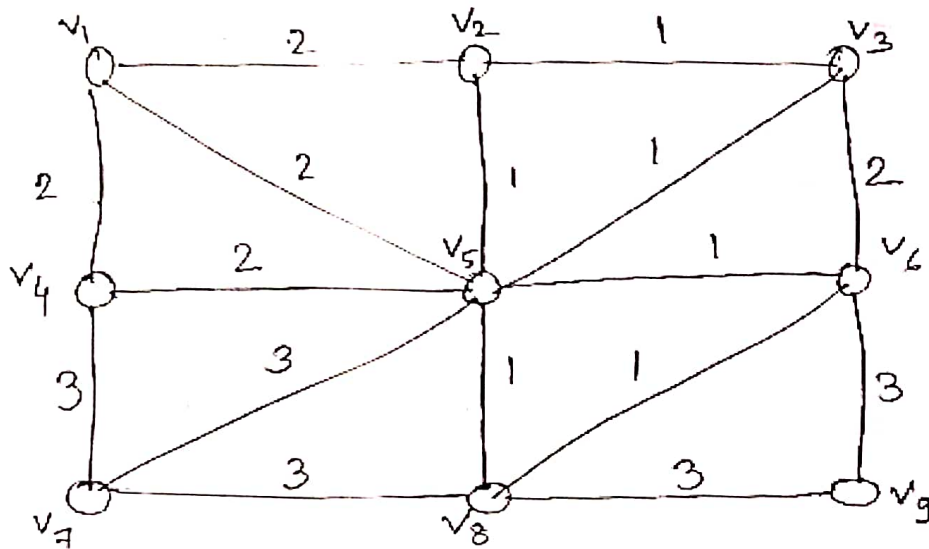
1

P.T.O

Q.3. Following in the adjacency matrix A of an undirected graph G

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

Draw G and Find its adjacency list representation.

Or

Find a minimum spanning tree of the following graph:-

Q.4. Insert the following elements in a binary search tree and them perform inorder traversal in it.

14, 10, 17, 12, 11, 20, 18. 25, 22, 23

Or

What is threaded binary tree? Give suitable example of left-unthreaded and right unthreaded binary tree write its applications.

Q.5. Write an algorithm to perform binary search.

Or

What is hashing? Explain different hashing functions with proper example.

(Section - 'B')   (12×5=60)

(Long Answer Type Questions)

Note: - Attempt all questions. Each question carries 12 marks.

Q.6. Convert the following infix expression into postfix and then evaluate it:-

6+2^3-4*5

Or

What is a circular queue ? Write algorithm to perform insert and delete operations in a circular queue.

Q.7. Differentiate between array and linked list with suitable example. Also mention their applications benefits and limitations.
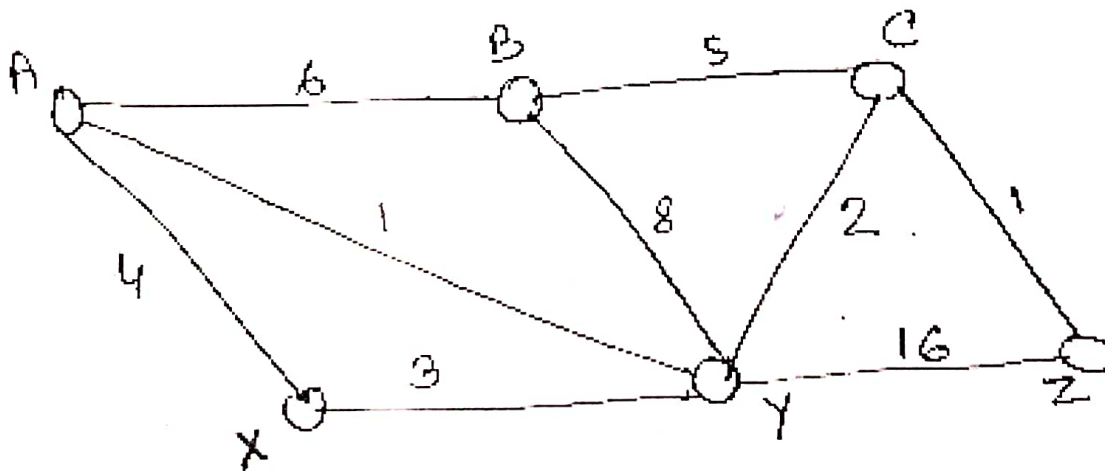
Or

Write algorithms to perform the following operations on a singly linked list.

(a) Insert a node at the end of linked list

(b) Delete first mode

Q.8. Perform Breadth first traversal and depth first traversal on the following graph:-

Or

Find the shortest path A to Z using Dijkstra shortest path algorithm.

Q.9. Construct an AVL search tree by insorting the following elements in the order of their occurrence.

64, 1, 44, 26, 13, 110, 98. 85, 115, 103

Or

Insert the following keys in the order shown below into an initially empty b-tree of order 3:

G. S. F. L. Q, X, Z, V, R. A. I, J, W

Q.10. Perform merge sort on the following data:-

22, 8, 62, 37, 33, 44, 86. 17, 7, 56

Or

Perform quick sort on the above data.

|Printed Pages: 04| Roll No. ....
B.Tech.(CSE)-IV Semester Examination - May, 2019 (Regular/ ATKT)
Theory of Computation
12MS407-A

Duration:- 3 Hours]   [Max. Marks:100
Instructions:
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The question paper is divided in two sections.
3. Attempt questions according to the instructions given with sections. Distribution of marks is given with sections.

Note:- Use mind map to answer the question.

(Section - 'A')   (8×5=40)
(Short Answer Type Questions)
Note: - Attempt all questions. Each question carries 08 marks.

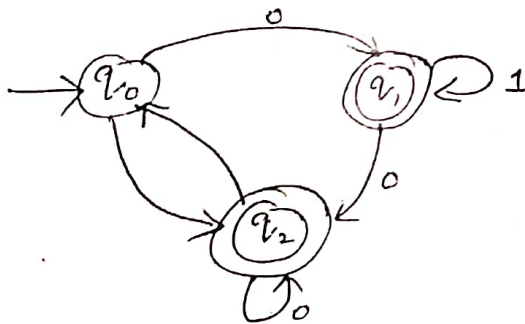Q.1. Evaluate closure of relation for, R = {(a, b), (b, c), (c, a)}

Or

Prove by mathematical induction

$$1 + 4 + 7 + \text{-----} + (3n - 2) = \frac{n(3n-1)}{2}$$

Q.2. Write proper definition of FSA and draw its mechanism.

Or

Draw transition table for below diagram.

Check string acceptability using transition function for 011010.

Q.3. Draw DFA for the below regular expression.

(a) (1*0)*1*   (b) (aa)*(bb)*b

Or

Simplefy below regular expression using identities.

(a) p + pq*q = a*bc*   where

p = b + aa*b and q = c

(b) R = ∈ + Pp*   where P = 1*(011)*

Q.4.   Define Push down Automata and its mechanism.

Or

Check ambiguity in following CFG for a + a*b

S-> S+S/S*S/a/b

Q.5.   Explain halting problem for undecdability.

Or

Define turing machine with its mechanism.

(Section - 'B')   (12×5=60)

(Long Answer Type Questions)

Note: - Attempt all questions. Each question carries 12 marks.

Q.6.   Tabulize Chomsky hierchy with the following attributes language; language example, Grammar, Grammar example, type of grammar, Automata/ machine used, no of topples. no of parameter in δ In/out.

Or

Apply set operation on following sets, A={ a, c, e, g, i} , B={ a, e, i, o, u}

(i) Union – AUB = B∩B

(ii) Intersection, A∩B = B∩B

(iii) Complement, A′ & B′

(iv) Set Difference A-B & B-A

(v) Symmetric Difference A∆B=B∆A

(vi) Cartesian Product A×B & B×A

2
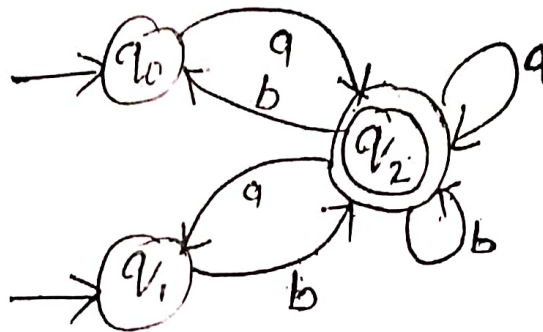
Q.7. Convert the below NFA to DFA
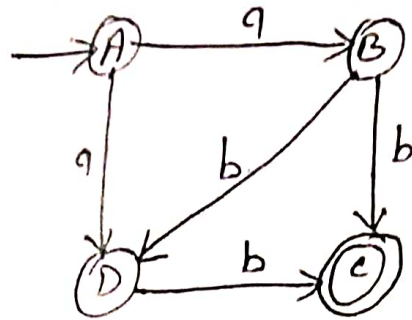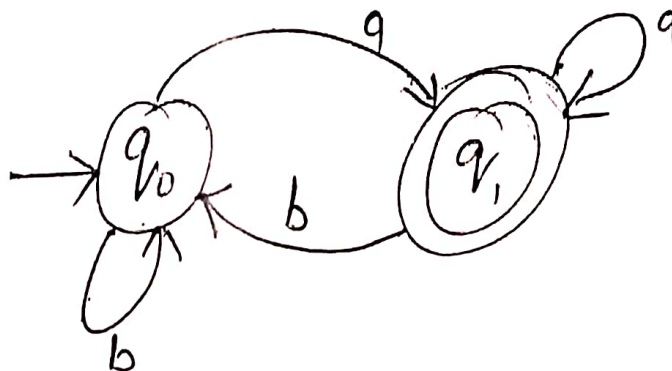

Or

Convert below NFA to DFA

Q.8. Prove Arden's theorem, and convert below DFA to regular expression.

Or

Prove that L={a^p|p is prime} is

Regular language using pumping Lemma

P.T.O

Q.9. Consider a PDA; P=(Q. Σ, Γ, δ, q_0, F) , where Q = { q_0, q_1, q_2, q_3}, Σ={0, 1}, Γ = {0, 1} , q_0 = {q_0}, F = {q_3} and δ defined as.

(i) $\delta(q_0, 0, \epsilon) \rightarrow (q_1, 0)$

(ii) $\delta(q_1, 0, 0) \rightarrow (q_1, 00)$

(iii) $\delta(q_1, 1, 0) \rightarrow (q_2, \epsilon)$

(iv) $\delta(q_2, 1, 0) \rightarrow (q_2, \epsilon)$

(v) $\delta(q_2, \epsilon, \epsilon) \rightarrow (q_3, \epsilon)$

Draw transition table, transition diagram and check for string acceptability for 000111 for above PDA transition function.

Or

Prove that L={$a^n b^n$ / n ≥ 1} is CFL using pumping Lmma upto 5th iteration.

Q.10. Consider tunning machine. TM = {Q, Γ, Σ, δ, q_0, #, F} where Q = {q_0, q_1, q_2, q_3}

Σ={a,b}, Γ={a,b,x,y,#} and δ defined as

(i) $\delta(q_0, a) \rightarrow (q_1, b, R)$

(ii) $\delta(q_0, x) \rightarrow (q_1, y, L)$

(iii) $\delta(q_1, x) \rightarrow (q_2, y, R)$

(iv) $\delta(q_2, y) \rightarrow (q_3, \#, R)$

(v) $\delta(q_3, x) \rightarrow (q_0, y, L)$

Design universal turning machine for above transition function.

Or

Tabalize any 12 closure properties of all four formal languages.

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[Printed Pages: 02]   Roll No. ....

B.Tech.(CSE)-IV Semester Examination - May, 2019 (Regular/ ATKT)
Data Communication
12CA409

Duration:- 3 Hours]   [Max. Marks:100

Instructions:

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The question paper is divided in two sections.
3. Attempt questions according to the instructions given with sections. Distribution of marks is given with sections.

(Section - 'A')   (8×5=40)
(Short Answer Type Questions)

Note: - Attempt all questions. Each question carries 08 marks.

Q.1.   What is data communication? Write about characteristics and components of data communication.

<center>Or</center>

What do you mean by data flow? Explain with example.

Q.2.   What is spread spectrum? Explain the concept of frequency hopping.

<center>Or</center>

Write short notes on following:-

(a) ISDN

(b) X.25 network

Q.3.   What is the importance of connectors? Write about fiber optic conncetors.

<center>Or</center>

Write short notes on following:-

(a) LAN card

(b) RJ-45 & RJ-11

Q.4.   Write short notes on following:-

(a) Cross Talk

(b) LATA

<center>Or</center>

Write short notes on following:-

(a) Electromagnetic Radiation

(b) Polarization

<center>1</center>

Q.5. What do you mean by transmission errors? Write about the different types of transmission errors.

Or

Data bits 1011 have to be transmitted construct the odd parity seven bit hamming code for the given data.

(Section - 'B') (12×5=60)

(Long Answer Type Questions)

Note: - Attempt all questions. Each question carries 12 marks.

Q.6. Write short notes on following:-

(a) Data Representation

(b) Bipolar Line Coding

Or

Write short notes on following:-

(a) Transmission Modes

(b) LZ compression

Q.7. What is switching? Explain different types of switching.

Or

What is multiplexing? Write about different types of multiplexing.

Q.8. Explain different network connecting devices in detail.

Or

Enlist and compare all network topologies.

Q.9. Explain guided media with examples.

Or

Explain DSL technologies with neat & clean diagram.

Q.10. Write short notes on following:-

(a) CRC

(b) Checksum

Or

Write short notes on following:-

(a) Hamming Code

(b) Convolution Code

[Printed Pages: 02]   Roll No. ....
B.Tech.(CSE)-IV Semester Examination - May, 2019 (Regular/ ATKT)
E-Commerce and E-Governance
12CA408

Duration:- 3 Hours]   [Max. Marks:100
Instructions:
   1.   Write your Roll No. on the top immediately on receipt of this question paper.
   2.   The question paper is divided in two sections.
   3.   Attempt questions according to the instructions given with sections. Distribution of marks is given with sections.

<div align="center">

(Section - 'A')   **(8×5=40)**

(Short Answer Type Questions)
</div>

Note: - Attempt all questions. Each question carries 08 marks.

Q.1.   Differentiate between value chain and supply chain with example.

<div align="center">Or</div>

What do you understand by ethical issues in E-commerce? Explain its types in brief along with their example.

Q.2.   Is customer service and customer support are similar? If 'Yes', then why? If 'No', then why?

<div align="center">Or</div>

Write a case study on E-commerce in passenger air transport.

Q.3.   Explain mobilization and Lobbying model. Also, explain why it is different from interactive service model?

<div align="center">Or</div>

(a) What do you understand by E-governance?

(b) Differentiate E-governance and E-government.

Q.4.   Draw neat and clean diagram of architecture of the E-framework.

<div align="center">Or</div>

Draw neat and clean diagram of the architecture of data mining in E-commerce.

Q.5.   What is E-government security? Why would somebody attack government system?

<div align="center">Or</div>

What are the types of information exposed in data breaching? Explain with the help of diagram which shows the percentages of information breached.

(Section - 'B') (12×5=60)

(Long Answer Type Questions)

Note: - Attempt all questions. Each question carries 12 marks.

Q.6. (a) Explain E-business model. Also explain why E-business is important in today's world.

(b) Write and explain any five types of E-business models along with the example of each.

Or

What is E-commerce? Explain in detail with its advantages and disadvantages.

Q.7. Write short notes on the following:-

(a) Debit cards
(b) E-money
(c) M-commerce
(d) Customer Support
(e) Marketing on the web
(f) Smart cards

Or

(a) Explain how E-commerce can be made public through the web.

(b) Why M – commerce is different from E-commerce?

Q.8. (a) Why E-governance models are important for building services in the government organizations?

(b) Explain G2C and G2B.

Or

How broadcasting model of E-governance helps governments to grow? Explain in detail with a suitable example.

Q.9. What is the full form of NICNET? Explain the role of NICNET in E-governance in detail.

Or

(a) What is meant by E-seva? Which type of business model will be used in E-seva?

(b) What does the E-commerce framework or E-framework should do?

Q.10. What are the different security threats to E-commerce? Explain any five of them in detail.

Or

(a) What is the security of E-commerce?

(b) Explain security for client computers with an explanation of web bugs.

(c) In how many ways cookies can protect the E-commerce? Explain.

2

P T O

[Printed Pages: 02]   Roll No. ....

B.Tech.(CSE)-IV Semester Examination - May, 2019 (Regular/ ATKT)
Computer System and Its Architecture
12CA403

Duration:- 3 Hours]   [Max. Marks:100

Instructions:
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The question paper is divided in two sections.
3. Attempt questions according to the instructions given with sections. Distribution of marks is given with sections.

(Section - 'A')   **(8×5=40)**
(Short Answer Type Questions)

Note: - Attempt all questions. Each question carries 08 marks.

Q.1. Explain the basic functional units of a simple computer system. Explain its architecture.

Or

What do you mean by register organization? Draw general register structure diagram and explain its working with an example.

Q.2. What is an instruction? What are its type? Draw and explain the working of instruction cycle.

Or

What is address mode? Explain the advantages and disadvantages of various addressing modes.

Q.3. Write short notes on following:-

(a) System Bus   (b) I/O Ports.

Or

What are handshaking signal? Explain the handshake control of data transfer during input and output operations.

Q.4. What are the various memory mapping techniques? Explain with suitable example.

Or

(a) What is associative memory? Draw its block diagram. Also explain its operation in terms of match logic, read and write operation.

(b) Consider a reference string:- 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

Find out the no of page faults respected to

(a) FIFO   (b) LRU

1   P. T O

Q.5. What is flynn's classification of computer architecture?
Explain SISD, SIMD, MISD and MIMD in detail with relevant diagram.

Or

Convert the following into floating point representation single precision.
(a) -26   (b) 13.5

(Section - 'B')   ($12 \times 5 = 60$)
(Long Answer Type Questions)
Note: - Attempt all questions. Each question carries 12 marks.

Q.6. What do you mean by micro operations? Discuss their types in detail.

Or

(a) What are the various types of registers used in computer system?
(b) Write short note on :- Memory Transfer

Q.7. Write short note on:
(a) Interrupt   (b) Difference between RISC & CISC

Or

Discuss the role of control will in computer system. Explain in hardwired and micro programmed control unit in detail.

Q.8. (a) Discuss the DMA driven data transfer technique.
(b) What are the various modes used in DMA data transfer?

Or

(a) Differentiate between Isolated I/O and memory mapped I/O.
(b) Discuss the operation of any two peripheral devices.

Q.9. What is computer memory? Explain the types and functions of main memory.

Or

(a) Define the term "spatial locality and temporal locality".
(b) Explain working of " Hard Disk"

Q.10. (a) What is pipelining? Draw the structure of four stage instruction pipeline.
(b) Write down various pipeline hazard's.

Or

Multiply using Booth multiplication algorithm-
100010*10101

[M19549]

B.Tech.(CSE)-IV Semester Examination - May, 2019 (Regular/ ATKT)
Object Oriented Programming in C++
12CA401

Duration:- 3 Hours]
[Max. Marks:100

Instructions:
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The question paper is divided in two sections.
3. Attempt questions according to the instructions given with sections. Distribution of marks is given with sections.

(Section - 'A') **(8×5=40)**

(Short Answer Type Questions)

Note: - Attempt all questions. Each question carries 08 marks.

Q.1. Explain scope resolution operator with an example.

Or

Explain inline functions with an example.

Q.2. What is friend function? Write the characteristics of friend function with all example.

Or

Explain data, members, number function and objects with syntax/ example of C++.

Q.3. (a) What is constructor in C++?

(b) Explain default constructor and parameterized constructor with example.

Or

Explain destructor in C++ with an example.

Q.4. (a) List all types of inheritance in C++.

(b) Implement single inheritance with public derivation.

Or

Differentiate between early and late binding.

P.T.O

Q.5. What is file mode? Describe the various file mode options available.

Or

What is function template in C++? Explain with example.

(Section - 'B') **(12×5=60)**

(Long Answer Type Questions)

Note: - Attempt all questions. Each question carries 12 marks.

Q.6. State the important features of object oriented programming. Compare object oriented programming with procedure oriented programming.

Or

Explain the following:-

(a) Reference Variable   (b) Default Arguments

Q.7. What is static data member? What are the important characteristics of the static member variable?

Or

A friend function can be friend of two class. Justify your answer with an example in C++.

Q.8. What is operator overloading? Write a C++ program to overload unary minus(-) operator.

Or

What is function overloading? Explain with suitable example.

Q.9. Explain the following:-

(a) Virtual Function   (b) Virtual base class

Or

Define exception handling. Explain the use of try , catch and throw for exception handling in C++ with an example.

Q.10. How we can create our own manipulators in C++?

Or

Explain the following:-

(a) to read a file   (b) Create a new file

2