APC - 5269

Second Year B.C.A. (Semester - I) Examination
Paper - 15BCA201
Data Structures

Time : Three hours] [Full Marks - 60

N.B. :
i) All questions carry equal marks
ii) Due credit will be given to neatness & adequate dimensions.
iii) Assume suitable data wherever necessary.
iv) Diagrams & Equations should be given wherever necessary.
v) Use Blue/Black ink/refill only for writing the answer book.

Q.1 Choose correct option from given alternatives. 5

a) The method of accessing data to locaate given item is known as _____
   i) Traversing ii) Insertion
   iii) Deletion iv) Locating

b) In the linked list _____
   i) An Array of pointer to the links
   ii) Each node contain a pointer to next node
   iii) The links are stored in array
   iv) All of the above

c) In polish notation when operator symbol is placed between the two operands it is known as ____
   i) Infix ii) Prefix
   iii) Suffix iv) Postfix

d) Stack is known as _____ type structure.
   i) LILO ii) FIFO
   iii) LIFO iv) FILO

e) What can be said about the array representation of a circular queue when it contains only one element ?
   i) FRONT = REAR = NULL
   ii) FRONT = REAR + 1
   iii) FRONT = REAR -1
   iv) FRONT = REAR

Q.2 a) Explain following terms :- 6
   i) Time complexity ii) Space complexity
   b) What do you mean by data structures ? Explain its types in details. 5

OR

Q.3 a) What is Algorithm ? Discuss the step to write an algorithm with proper example. 5
   b) What are the primitive operations performed on Linear Array ? Explain the memory representation of an Array. 6

Q.4 a) Explain the following terms. 6
   i) two way linked list ii) garbage collection
   b) What is Linked List ? Explain its representation in memory with proper example. 5

OR

Q.5 a) Write and explain the algorithms to insert node in the linked list. 5
   b) Explain the following terms. 6
   i) Header linked list ii) Underflow and overflow

Q.6 a) What is Recurtion ? Define recursive procedure with suitable example. 5
   b) What is Stack ? Explain PUSH and POP operations on stack with proper example. 6

OR

Q.7 a) What is Polish notation ? Explain Prefix, Postfix and Infix with suitable example. 6
   b) Write algorithms for Tower of Hanoi problem of N disc. 5

Q.8 a) Explain the following terms. 6
   i) Priority Queue ii) Binary tree
   b) Explain the memory representation of a queue in detail. 5

OR

Q.9 a) What do you mean by traversing a tree. Explain the types in detail. 6
   b) What is mean by De-queue ? Explain different types of De-queue. 5

Q.10 a) What is Sorting ? Explain insertion sort with proper example. 6
   b) What is Graph ? What do you mean by degree of a node and adjacent node ? With suitable example. 5

OR

Q.11 a) State and explain Link Representaion of Graph with proper example. 5
   b) What is Hashing ? What are the types of hashing functions ? Explain with suitable example. 6