B.M.S COLLEGE OF ENGINEERING, BANGALORE-19
(Autonomous Institute, Affiliated to VTU)
Computer Science & Engineering

INTERNALS-1

CourseCode: 19CS3PCDST	**CourseTitle: Data Structures**	
Semester:3 A/B/C/D	**MaximumMarks: 40**	**Date: 22-10-2020**
Faculty Handling the Course:	Dr. Kayarvizhy, Sheetal V A,Selva kumar S	

Instructions: ***Internal choice is provided in Part C.***

PART-A

Total 5 Marks (No Choice) [CO1-PO1]

No.	Question	Marks
1	Write the difference between Linear Queue and Circular Queue.	5

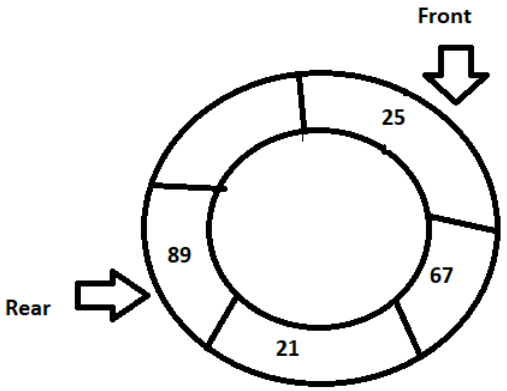
PART-B

Total 15 Marks (No Choice) [CO2-PO2]

No.	Question	Marks

2a	Analyze the below given code and modify the code to work without declaring items[SIZE], front, rear as **GLOBAL** variable.
	
	`#include <stdio.h>`
	`#define SIZE 5`
	
	`void enQueue(int);`
	
	`int items[SIZE], front = -1, rear = -1;`
	
	`int main() {`
	
	`  enQueue(1);`
	`  enQueue(2);`
	`  enQueue(3);`
	`  display();`
	`}`
	
	`void enQueue(int value) {`
	`  if (rear == SIZE - 1)`
	`    printf("\nQueue is Full!!");`
	`  else {`
	`    if (front == -1)`
	`      front = 0;`
	`    rear++;`
	`    items[rear] = value;`
	`    printf("\nInserted -> %d", value);`
	`  }`
	`}`
	
	`void display() {`
	`  if (rear == -1)`
	`    printf("\nQueue is Empty!!!");`
	`  else {`
	`    int i;`
	`    printf("\nQueue elements are:\n");`
	`    for (i = front; i <= rear; i++)`
	`      printf("%d  ", items[i]);`
	`  }`
	`  printf("\n");`
	`}`
		5

2b	Analyze the given line of code below and show the function call trace used by the Operating System.
	
	`#include <stdio.h>`
	
	`long int funcal(int b,int p)`
	`{`
	`  long int result=1;`
	`  if(p==0) return result;`
	`  result=b*(funcal(b,p-1));`
	`}`
	`int main()`
	`{`
	`  int x,y;`
	`  long int result;`
	
	`  printf("Enter value of x: ");`
	`  scanf("%d",&x);`
	
	`  printf("Enter value of y: ");`
	`  scanf("%d",&y);`
	
	`  result=getPower(x,y);`
	
	`  printf("result is: %ld\n",result);`
	
	`  return 0;`
	`}`
		5

2c	Consider the Circular Queue of size 5 given below and perform the following operations. Represent the status of the Circular Queue after each operation.  1.Enqueue(90) 2.Enqueue(20) 3.Dequeue() 4.Enqueue(15) 5.Enqueue(40)	**5**

PART- C

Total 20 Marks (Choice between question 3a & 3b, choice between question 4a & 4b) [CO3-PO3]

No.	Question	Marks
3a	Develop an application (C code) to evaluate the below given Postfix expression and also show the stack contents change in each step. AB+C*D/	**10**
	OR	
3b	Design and implement the below given problem statement with most suitable data structure. The balanced bracket problem is to recognize sentences composed of sequences of two symbols, (and), which are correctly nested. E.g. (()) is correctly nested but ())is not. A limit of ten symbols per sentence was assumed.	**10**
4a	The XYZ clinic has a waiting room with ten chairs. The chairs available in the clinic should be designed to occupy based on the FIFO architecture and also more efficiently by allowing customers to occupy the seats vacantly. In the case of no vacant seats in the waiting room, a "Waiting Room Full" message should be displayed at the reception counter. Develop an application(C Program) for the above scenario with a suitable data structure.	**10**
	OR	
4b	Develop an application (C Program) with suitable data structure to demonstrate the Online Movie Ticket Reservation system, in which users request should get process on the basis of First come First basis and display "Reservation Full", "Reservation Started" appropriately based on the availability of the Tickets.	**10**

ALL THE BEST