

1. Consider the incomplete program given below. The output of the program is 5-4-3-2-1-0-. Copy the given code and add the missing details of the **void** function *change* [6]

```
#include <stdio.h>
int main()
{
    int i,a[6]={0,1,2,3,4,5};
    change(a+2,6);
    for(i=0;i<6;i++)
        printf("%d-",a[i]);
    printf("\n");
    return 0;
}
```

2. What is the output of the following program? Justify your answer. [7]

```
#include <stdio.h>
int f(int,char);
int main(){
    printf("%d\n",f(11,'A'));
    return 0;
}

int f(int n,char c){
    printf("*");
    if(n<=0){
        printf("\n");
        return 0;
    }
    printf("%c",c);
    return n+f(n-2,c+2);
}
```

3. Copy the given code and make modifications at the appropriate places according to the comments. You may remove comments from your code. After calling the **void** function *alphcv*, the identifiers **nvow** and **ncons** respectively contain the number of vowels and number of consonants in the string **a**. (Do not use *strlen()* function). [10]

```
#include<stdio.h>
//write the prototype of the function alphcv
int main()
{ int nvow,ncons;
    char a[25]="MTH409: EndSem Exam";
    //call the void function alphcv here
    printf("No of vowels = %d, No of consonants = %d\n",nvow,ncons);
    return 0;
}
//write the details of the function alphcv here
```

4. The following program (see next page) prints the name and date of birth of Mr S Pal who was born in February 20, 1980. Copy the given code and make modifications at the appropriate places according to the comments. The output of the program is

Name: Mr S Pal

Date of birth: 20/2/1980

The outputs “Mr S pal” and “20”, “2”, “1980” must be generated using the identifier **p** only. You are not allowed to use any extra variable. [6]

```
#include<stdio.h>
#include<string.h>
typedef struct
{
    int dd,mm,yy;
}dob;
typedef struct{
    char name[100];
    dob *dmy;
}person;
int main()
{   dob date;
    person p;
    //Assignment statement(s) here
    //Print statements here
    return 0;}
```

5. Consider the incomplete program given below. The program multiplies two complex numbers $a = 2 + 3i$ and $b = 3 + 4i$ and stores the result in c . Copy the given code and add the missing details of the function *multc*. [6]

```
#include <stdio.h>
typedef struct{
    double re,im;
}complex;
int main(){
    complex a={2,3},b={3,4},c;
    c=multc(&a,b);
    printf("c=%0.2lf + %0.2lf i\n",c.re,c.im);
    return 0;}
```

6. A node of a linked list is a structure that consists of two components: an integer and a pointer to a structure of the same type. **Head** is a structure that holds two pointers to node structure. Look at the schematic diagram below and implement it in a C program. Each node must be created using dynamic memory allocation. [10]

