

5. (a) State **four** characteristics of a good program. (2 marks)

- (b) (i) Identify a type of an error which could arise from each of the following scenarios in Pascal programming:

I. a missing semicolon; (1 mark)

II. erroneous output; (1 marks)

III. program terminated prematurely due to wrong input; (1 mark)

IV. error due to certain combinations of data. (1 mark)

- (ii) For each of the errors identified in (i). State the stage in which the error is encountered. (2 marks)

- (c) (i) Differentiate between *dummy* and *exceptional test data* as used in programming. (4 marks)

- (ii) Specify the function of each of the following delimiters as used in C programming:

I. () (1 mark)

II. []

(1 mark)

III. { }

(1 mark)

(d) Write an algorithm that could be used to represent binary search logic.

(5 marks)

6. (a) Define the term *identifier* as used in programming.

(2 marks)

(b) With the aid of an example in each case, differentiate between *DIV* and *MOD* operators as used in Pascal programming.

(4 marks)

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- [illegible]

- [illegible]

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7. (a) Write the conversion specification of each of the following as used in C programming:

(i) Octal numbers; (1 mark)

(ii) Hexadecimal numbers; (1 mark)

(iii) Single character. (1 mark)

(b) With the aid of an example in each case, describe each of the following data types as used in Pascal programming:

(i) subrange; (2 marks)

(ii) enumerated. (2 marks)

(c) (i) Outline the feature that makes *low level* language inconvenient to use. (2 marks)

(ii) Outline **four** characteristics of a *high level* programming language. (4 marks)

- (d) Table 1 shows the water billing criteria in a certain town. Use it to answer the question that follows.

	Units used	Price per unit (Ksh)
1.	70 and above	120
2.	60 < units < 69	80
3.	40 < units < 59	60
4.	0 < units < 39	30

Table 1

Write a Pascal program that accepts the current and previous meter readings, the program then computes and outputs amount payable by a client.

Note: A standing charge of Ksh.120 is chargeable for all customers regardless of units used.
(7 marks)

[illegible]

8. (a) Outline the use of each of the following Pascal functions:

- (i) CHR;

(1 mark)

- (ii) SUCC.

(1 mark)

- (b) (i) Outline **two** properties of a linear data structure. (2 marks)

[illegible]

- (ii) Mary was given a task to create a program for a certain college. She noted that the college is made up of several departments with distinct functionalities.

- I. State the most appropriate programming approach she could use. (1 mark)

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- II. Outline **three** advantages of the approach stated in I. (3 marks)

[illegible]

- (c) Write a Pascal program to read twelve integers in an array named Q in row wise order of four elements per row. The program then outputs the resultant array. (4 marks)

[illegible]

- (d) (i) Name **three** predefined mathematical functions used in Pascal programming. (3 marks)

- (ii) Write a logical statement for each of the following as used in C programming:

I. Medical allowance is more than 2250 for the staff whose job group is not K. (1 mark)

II. Stock below 200 for itemno_100 or in shop A. (1 mark)

- (iii) The following is a segment of a C program created by a student. Use it to answer the question that follows.

```
main ()
{
    int i;
    for(i=1;i<=50;i++)
        if(i%7==0)
            printf("%d",i)\n;
}
```

Write the output generated when the program segment is executed. (3 marks)
