THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

036/2 INFORMATION AND COMPUTER STUDIES 2

(For Both School and Private Candidates)

Time: 3 Hours **ANSWERS** **Year: 2006**

Instructions

1. This paper consists of three questions

2. Answer two questions.

1. The value of x in quadratic equations can be obtained by using the general formula:

Solution:

(a) Draw a flow chart to represent the design of the program.

Explanation: A flowchart for solving a quadratic equation involves the following steps:

i. Start.
ii. Input the coefficients a, b, and c.
iii. Calculate the discriminant, $D = b^2 - 4ac$.
iv. Check if D is negative. If yes, print "No real roots" and stop.
v. If D is zero, calculate $x = -b / (2a)$ and print the root.
vi. If D is positive, calculate the roots $x_1 = (-b + \sqrt{D}) / (2a)$ and $x_2 = (-b - \sqrt{D}) / (2a)$, and print them.
vii. End.

(b) Using BASIC language, write a program which will implement the drawn flowchart to solve the quadratic equation.

```
10 INPUT "Enter the value of a: ", A
20 INPUT "Enter the value of b: ", B
30 INPUT "Enter the value of c: ", C
40 LET D = B^2 - 4 * A * C
50 IF D < 0 THEN PRINT "No real roots": END
60 IF D = 0 THEN
70     LET X = -B / (2 * A)
80     PRINT "The root is: "; X
90     END
100 LET X1 = (-B + SQR(D)) / (2 * A)
110 LET X2 = (-B - SQR(D)) / (2 * A)
120 PRINT "The roots are: "; X1; " and "; X2
130 END
```

2. The following is the inventory data in Tsh:

Solution:

Write a BASIC program to read and calculate the values (XX) and the total value (TXX).

```
10 DIM PN$(4), DESC$(4)
20 DIM UPRICE(4), QTY(4), VALUE(4)
30 FOR I = 1 TO 4
40     INPUT "Enter Part Number: ", PN$(I)
```

```
50     INPUT "Enter Description: ", DESC$(I)
60     INPUT "Enter Unit Price: ", UPRICE(I)
70     INPUT "Enter Quantity: ", QTY(I)
80     LET VALUE(I) = UPRICE(I) * QTY(I)
90 NEXT I
100 LET TXX = 0
110 FOR I = 1 TO 4
120     PRINT "Part Number: "; PN$(I); " Description: "; DESC$(I); " Unit Price: "; UPRICE(I); " Quantity:
"; QTY(I); " Value: "; VALUE(I)
130     LET TXX = TXX + VALUE(I)
140 NEXT I
150 PRINT "Total Value: "; TXX
160 END
```

3. Write a BASIC program to handle 4 types of conversions:

Solution:

(a) Kilometers to miles
(b) Miles to kilometers
(c) Celsius to Fahrenheit
(d) Fahrenheit to Celsius

```
10 PRINT "Conversion Menu:"
20 PRINT "1. Kilometers to Miles"
30 PRINT "2. Miles to Kilometers"
40 PRINT "3. Celsius to Fahrenheit"
50 PRINT "4. Fahrenheit to Celsius"
60 INPUT "Choose an option (1-4): ", OPTION
70 IF OPTION = 1 THEN
80     INPUT "Enter kilometers: ", KM
90     LET MILES = KM * 0.621371
100     PRINT "Miles: "; MILES
110     END
120 IF OPTION = 2 THEN
130     INPUT "Enter miles: ", MILES
140     LET KM = MILES / 0.621371
150     PRINT "Kilometers: "; KM
160     END
170 IF OPTION = 3 THEN
180     INPUT "Enter Celsius: ", C
190     LET F = (C * 9 / 5) + 32
200     PRINT "Fahrenheit: "; F
```

```
210    END
220 IF OPTION = 4 THEN
230    INPUT "Enter Fahrenheit: ", F
240    LET C = (F - 32) * 5 / 9
250    PRINT "Celsius: "; C
260    END
```