



Allowed Tables and Charts: None

Answer all the following Questions

Question (1)

(5 Marks)

Write a BASIC statement that corresponds to each of the following algebraic equations:

$$1-1 \quad z = \left(\frac{x-1}{x}\right) + \frac{1}{2}\left(\frac{x-1}{x}\right)^2 + \frac{1}{4}\left(\frac{x-1}{x}\right)^4 + \frac{1}{5}\left(\frac{x-1}{x}\right)^5$$

$$1-2 \quad k = \frac{(x_1+x_2)^m (y_1+y_2)^n}{\left(\frac{x_1}{y_1}\right)^{m+n} \left(\frac{x_2}{y_2}\right)^{m-n}}$$

1-3 $w = \frac{u+v}{s+t}$, also assign certain suitable variable to (Eleven O' Clock)

$$1-4 \quad f = \left(\frac{2a \cdot b}{c+1} - \frac{t}{3(p+q)}\right)^{\frac{1}{3}}$$

$$1-5 \quad \phi = \frac{\pi(a+b)^2 - 7.2a\sqrt{b+c}}{c} \cdot \frac{1}{(a+b)^n}$$

Question (2)

(10 Marks)

Try to detect 10 syntax or logic Errors accompanied by reasons among the following BASIC program to compute the ROOTS OF AN EQUATION $\pi(a+b)^2 - 7.2a\sqrt{b+c}$ أذكر رقم الجملة الخاطئة فقط والأسباب بجوارها ولا تقترح الجملة البديلة الصحيحة (عشرة جمل خاطئة فقط).

```
100 CLEAR SCREEN
120 An iterative method for computing roots of an equation
120 READ "starting value of the root and max no of iteration"; x$, N
130 PRINT
140 LET 1= k
150 LET x1$=(10- 3*x$ ^ 2)^0.2:DATA 1, 16, 1, 10
160 PRINT$
170 PRINT "Iteration="; k, "X1=";x1$
180 IF ((x$-x1$)^2)^0.5<=0.00001 THEN 230
190 IF k= N THEN GO TO 220
200 LET x1$= x$
210 LET k =k + 1
220 GOT0 150
230 PRINT$
240 PRINT "THE FINAL ANSWER IS X="; x1$
250 PRINT$ : PRINT "NUMBER OF ITERATIONS REQUIRED=";k
260 END
270 REM
280 PRINT
290 PRINT "Computation has not converged after ";k ; "iterations"
300 PRINT
310 PRINT "LAST VALUE OF X = ";x1
320 END
```



Allowed Tables and Charts: *None*

Continued

Question (3)

(10 Marks)

Draw a suitable flowchart then rewrite the same program of question number 2, in its correct form using WHILE ... WEND command for counting number of iterations.

Question (4)

(10 Marks)

Please write only the number of each separate statement, such as (4-1), (4-2), (4-3), ..., (4-20) accompanied by one word ("correct" or "wrong" followed by reason(s); only if it is wrong).
أكتب فقط رقم الجملة وبجوارها القرار (صحيحة، أو خطأ) مع ذكر الأسباب في حالة الخطأ فقط ولا تقترح الجملة الصحيحة.

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|--|--------------------|------------------------------------|
| 4-1 READ "Enter your name" ; NAMS | 4-2 50 GOTO 50 | 4-3 X=3/Y-AB+3^Y |
| 4-4 PRINT\$ (M/b)^2/N | 4-5 READ A; B; C | 4-6 ON K\$ GOTO 30, A+2, B-7, 90 |
| 4-7 INPUT "PRINT the value of b"; B | | 4-8 RESTORE "The value of b" |
| 4-9 INPUT "ENTER AN INTEGER" | 4-10 WHILE MS="OK" | 4-11 STORE A,B |
| 4-12 IF quantity<20 THEN 450 ELSE 20 | | 4-13 FOR y=x^2+3x THEN 73 |
| 4-14 ON K THEN 30,160,30,90 | | 4-15 IF ANSWER=YES THEN BEEP: STOP |
| 4-16 LOCATE (2* x),(y+x-3) | | 4-17 LOCATE 6: PRINT B1 |
| 4-18 LET Q\$=B\$-C\$+D\$ | | 4-19 M= -3:FOR A=M TO 20 STEP -2 |
| 4-20 DATA "JAN 2014" ,WEDNESDAY , "1 st. Year" | | |

Question (5)

(15 Marks)

Draw a flowchart, and then write a BASIC program that reads frequencies, ω , as 0.05, 0.1, 0.5, 1, 5, 10, 50, 100, 500, 1000 in rad/sec. The program computes the magnitude, MAG in decibel according to the following relationship: $MAG=20*\log_{10}(M)$, where,

$$M = \frac{\sqrt{\omega^2(\omega^2-3)^2+(6\omega^2+10)^2}}{0.49\omega^3+\omega(0.1\omega^2-1)^2}$$

and $\log_{10}(M)$ should be computed from the following

$$\text{expansion: } \log_{10}(M) = 0.8686 \left[\left(\frac{M-1}{M+1}\right) + \frac{1}{3} \left(\frac{M-1}{M+1}\right)^3 + \frac{1}{5} \left(\frac{M-1}{M+1}\right)^5 + \dots + \frac{1}{(2n-1)} \left(\frac{M-1}{M+1}\right)^{2n-1} + \dots \right]$$

The number of terms, n, should be given when the program is executed. The output should be displayed as a table of values of ω and corresponding value of MAG.

Question (6)

(10 Marks)

Write a BASIC program that asks the user to enter (n) real numbers, then prints out both the SMALLEST and BIGGEST numbers among them on the screen..

أكتب برنامجا بلغة البيسيك يستقبل (أثناء تشغيله) عددا معيناً من الأعداد الحقيقية ثم يطبع فقط أكبر وأصغر هذه الأعداد على الشاشة.

Note that the program must allow for receiving a new inputs without termination.

يجب أن يسمح البرنامج بسؤال المستخدم عن رغبته في إدخال قيم جديدة بدون الحاجة لتشغيل البرنامج مرة أخرى، مع إظهار الرسائل المناسبة عند الإدخال و عند الإخراج.

GOOD LUCK