



Allowed Tables and Charts: *None*

Answer all the following Questions

Question (1)

(5 Marks)

Write exactly the output when the following BASIC program is executed:

```
10 READ E,A,L,M$
PRINT M$;
E=E - A \ L
DATA 25,10
L=E*A
READ M$
M$="18"+" "+M$+" "+"2015"
DATA 4, Sunday, January
PRINT M$
PRINT "A=";A, "E=";E; "L=";L : END
```

Question (2)

(10 Marks)

Try to detect 10 syntax or logic Errors accompanied by reasons among the following BASIC program to compute the PRIME NUMBERS INTO FEBONACCI من فضلك أذكر رقم الجملة الخاطئة فقط والأسباب بجوارها ولا تقترح الجملة البديلة الصحيحة (عشرة جمل حاطنة فقط).

```
100 WIPE SCREEN
120 Febonacci and prime Numbers between certain given
120 Lower and Upper Limits
10 READ "Starting and Ending +ve integer values "; A, B
130 IF A \ 1 <> A OR A < 0 OR B < 0 OR B \ 1 <> B THEN 140 ELSE 10
140 IF A < B THEN SWAP A, B
145 F1 = 0: F2 = 1
150 PRINT " Febonacci Numbers and prime between"; A; "and"; B; "are as follows:"
20 F = F1 ^ F2: IF F >= A THEN 30 ELSE 80
30 IF FS <= B THEN 40 ELSE END
40 IF FS = 1 OR F = 2 OR F = 3 THEN 90
190 IF FS MOD 2 = 0 THEN 80
200 LET I = 3
70 IF FS MOD I = 0 THEN 80
220 IF I >= FS ^ .5 \ 1 THEN 90
230 I = I + 1: GOTO 70
80 F1 = F2: F2 = FS: GOTO 20
90 PRINT FS: GOTO 80
260 END
REM Starting and Ending +ve integervalues? 8,90
REM Febonacci Numbers and prime between 8 and 90 are as follows:
REM 13
REM 89
```

P. T.O. →



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 same line numbers and commands.

**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.

- 4-1 INPUT "PRINT the value of b";B      4-2 53 GOTO 53      4-3 LET QS=BS+CS+DS  
4-4 PRINTS (M/b)^2/N      4-5 READ A; B; C      4-6 ON K THEN 30,160,30,90  
4-7 READ "Enter your name" ; NAMS      4-8 RESTORE "The value of b"  
4-9 ENTER " input an integer"      4-10 X=3/Y-AB+3^X      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 KS GOTO 30, A+2, B-7, 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 QS=BS-CS+DS      4-19 M= -3:FOR A=M TO 20 STEP -2  
4-20 DATA "JAN 2015" ,SUNDAY , "1 st. Year"

**Question (5)**

**(15 Marks)**

Draw a flowchart, and then write a BASIC program to compute and print the number of terms, n, which must be considered to obtain an angle =  $\frac{\pi}{3}$  within error limits of .00001 as a result of calculating the inverse of cosine ( $\cos^{-1}$ ) at x=0.5 into the following approximation series:

$$\cos^{-1}x = \frac{\pi}{2} - \tan^{-1}z, \quad \tan^{-1}z = z - \frac{z^3}{3} + \frac{z^5}{5} - \frac{z^7}{7} + \dots \text{ up to } n \text{ terms. Where}$$

$$z = \frac{x}{\sqrt{1-x^2}} \quad \text{and} \quad \pi = 3.14159265.$$

**Question (6)**

**(10 Marks)**

For a set of given real numbers; X1, X2, X3, .. ,XN, Draw a flowchart, then write a BASIC program in order to compute and print the arithmetic mean ; XBAR. Also compute and print the mean deviation; MD and the standard deviation; SD. Note that:

$$\text{XBAR} = \frac{1}{N} \sum_{i=1}^N X_i, \quad \text{MD} = \frac{1}{N} \sum_{i=1}^N |X_i - \text{XBAR}|, \quad \text{and} \quad \text{SD} = \sqrt{\frac{1}{N} \sum_{i=1}^N (X_i - \text{XBAR})^2}$$

Example for numbers: 20.3, 0.15, -7.8, 55, 18.95, -3, -7.07, ...

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.