AGA KHAN UNIVERSITY EXAMINATION BOARD
SECONDARY SCHOOL CERTIFICATE
CLASS X EXAMINATION
APRIL/ MAY 2018

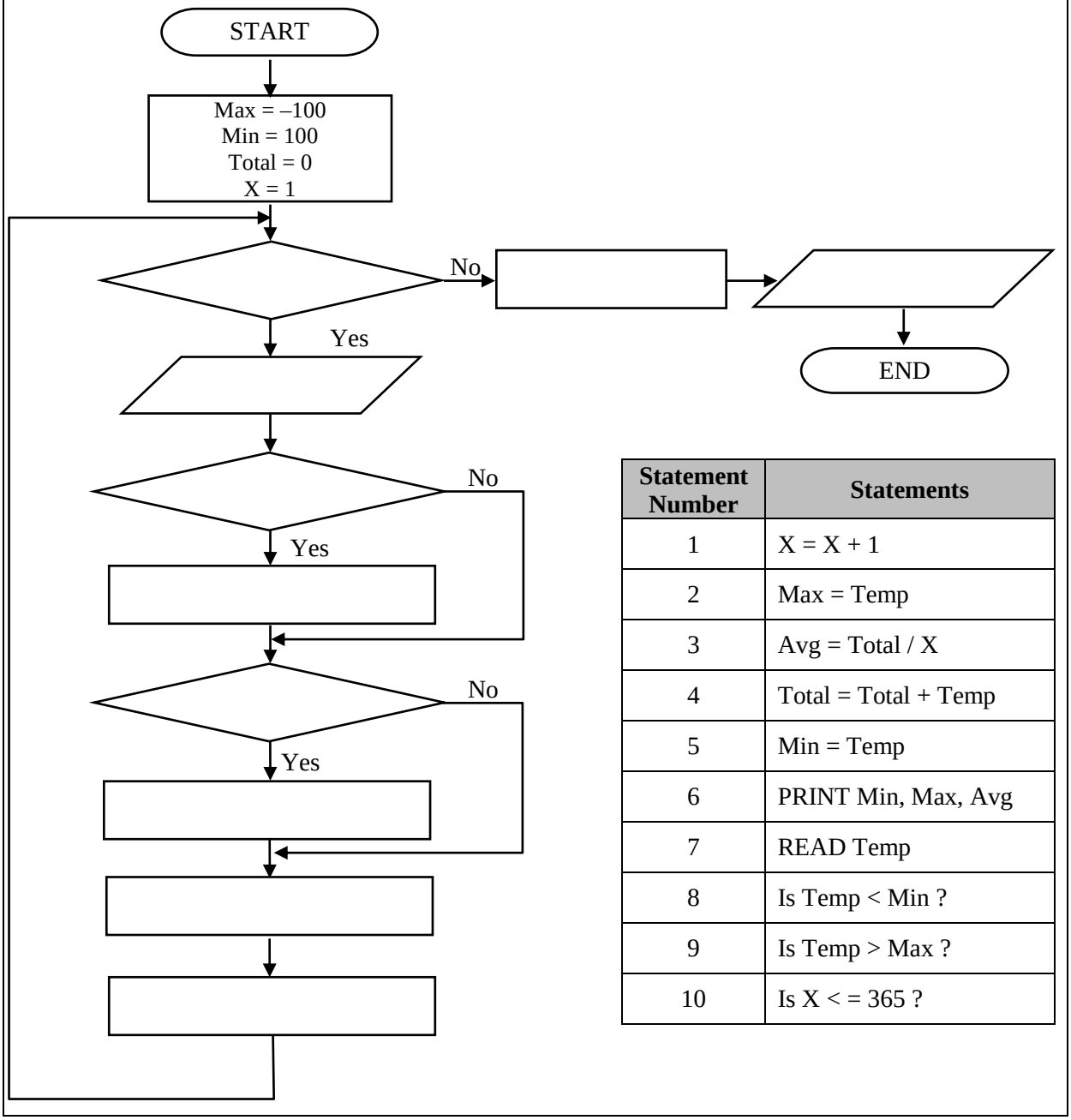
Computer Science Paper II

Time: 2 hours 25 minutes Marks: 40

Constructed Response Questions (CRQs)

Question 1:

The given flowchart takes temperature as input once a day for a year. It calculates and gives minimum, maximum and average temperature values as output. Some of the flowchart statements are missing. Complete the given flowchart by using the statement number only from the given table.



Statement Number	Statements
1	X = X + 1
2	Max = Temp
3	Avg = Total / X
4	Total = Total + Temp
5	Min = Temp
6	PRINT Min, Max, Avg
7	READ Temp
8	Is Temp < Min ?
9	Is Temp > Max ?
10	Is X < = 365 ?

Question 2a:

Write a GW-BASIC program that would calculate and give simple interest as output. The input would be the principal amount, interest rate per year and the number of years.

The formula to calculate simple interest is given below.

(Principal Amount × Interest Rate per Year × Number of Years) ÷ 100

Question 2b:

There are SIX relational operators in GW-BASIC.

Complete the given table by writing the operations and symbols of relational operators.

(**Note:** This first operation has been mentioned for your convenience.)

Operation	Symbol
Equal to	=

Question 3:

Loops are used for repetition of code in any programming language. However, it is possible to repeat a program code without using the loop as well.

Write a GW-BASIC program that would display the following text TEN times on output screen by using IF…THEN…ELSE and GOTO statements.

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(**Note:** Do NOT use any type of loops.)

Question 4:

a. Identify whether the given array representation is a one-dimensional array or two-dimensional array?

X$(0)	Lahore
X$(1)	Karachi
X$(2)	Quetta
X$(3)	Peshawar
X$(4)	Islamabad

b. State the major reason to support your selection of array in part (a).

c. If Hyderabad, Faisalabad, Khairpur, Gujranwala, Sukkur and Jacobabad are to be added to the array shown in part (a), then what would be the index number of the last element?

d. By looking at the array representation in part (a), how can one judge the data type of this array?

Question 5:

Write a user-defined function (using GW-BASIC) named CUBE to calculate the cube of any positive integer value. Input any integer value from user; call this function and print the output.

The formula to calculate the cube of any integer A is given below.

The formula for Cube = A × A × A

Question 6:

Complete the truth table for the given Boolean expressions.

A	B	C	A + B	$\overline{A+B}$	$X=\overline{(A+B)}.C$
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

Extended Response Questions (ERQs)

The following questions offered a choice between part **a** and **b**.

Question 7a:

Suppose you connect a virus infected USB drive to your Personal Computer (PC).

i. What are the possible threats that your PC might be exposed to? Discuss at least SIX possible threats.
ii. What steps should you take to avoid the viruses that can infect your PC?

Question 7b:

Artificial Intelligence (AI) is the science of making intelligent machines, especially intelligent computer programs. It is related to the task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.

Describe the use of artificial intelligence in the defence industry and weather forecasting. Also, write at least TWO benefits of using artificial intelligence in these fields.

Question 8a:

A small bookshop uses barcode which represents 5 digits. The last digit is called the check digit which is calculated as follows.

1. Add the first and third digit and multiply the result by 3
2. Add the second and fourth digit
3. Add the results of step 1 and 2
4. Divide the result of step 3 by 10 to get the remainder value
5. If the remainder is 0 then use it as a check digit, otherwise, subtract the remainder from 10 to get the check digit.

For instance, in 45678, the check digit is 8.

Write GW-BASIC code that would input the first four digits of barcodes of 150 books. It would calculate the check digit (fifth digit) and show it in output.

Question 8b:

Write a GW-BASIC program that must have one-dimensional arrays **A**, **B** and **C** respectively. Each array should be able to store fifteen integer values. The program should also perform addition operation on array **A** and **B**, store results in array **C** and show the sum of arrays in output.