The State of Israel
Ministry of Education
Exam Type: *Bagrut*
Exam Date: Summer 2019
Exam Number: 899282
English Translation (3)

מדינת ישראל
משרד החינוך
סוג הבחינה: בגרות
מועד הבחינה: קיץ תשע"ט, 2019
מספר השאלון: 899282
תרגום לאנגלית (3)

Computer Science

מדעי המחשב

Instructions for examinees

א. Duration of the exam: Two hours

ב. Exam structure and breakdown of points:

This exam has three parts.

Part One	(3 × 10)	— 30 points
Part Two	(1 × 10) + (2 × 20)	— 50 points
Part Three	(1 × 20)	— 20 points
	Total	— 100 points

ג. Material that may be used during the exam:

Any material, except for a programmable computer.

Write only in the answer booklet. Write "טיוטה" at the top of each draft page. Writing drafts on pages outside the answer booklet may lead to the disqualification of your exam.

הוראות לנבחן

א. משך הבחינה: שעתיים.

ב. מבנה השאלון ומפתח ההערכה:

בשאלון זה שלושה פרקים.

פרק ראשון	(10x3) –	30 נקודות —
פרק שני	(10x1) + (20x2) –	50 נקודות —
פרק שלישי	(20x1) –	20 נקודות —
	סה"כ	100 נקודות —

ג. חומר עזר מותר בשימוש:

כל חומר עזר, מלבד מחשב הניתן לתכנות.

כתוב במחברת הבחינה בלבד. רשום "טיוטה" בראש כל עמוד המשמש טיוטה.
כתיבת טיוטה בדפים שאינם במחברת הבחינה עלולה לגרום לפסילת הבחינה.

Good Luck!

בהצלחה!

Questions

Part One (30 points)

Answer all three questions 1-3 (each question – 10 points).

1. A program segment written in Pascal is shown below.
Using a trace table [טבלת מעקב], follow the execution of the program segment and write what will be printed.
For the input, choose a number between 0 and 10 inclusive.

```
B := −5 ;
READLN (A) ;
B := B * 2 ;
D := ABS (A + B) ;
WRITELN (D, A, B) ;
C := A − D ;
WRITELN (C) ;
```

2. A program segment written in Pascal is shown below.
Using a trace table [טבלת מעקב], follow the execution of the program segment and write what will be printed.
For the input, choose two different numbers smaller than 50.

```
READLN (S) ;
READLN ( T) ;
Y := T − S ;
X := 'HAVE' ;
Z := 'NICE' ;
WRITELN (X, 'A', Z, 'DAY', Y) ;
```

3. Write a program segment in Pascal that will accept three integers as input.
If the product of the first two integers is greater than the product of the first and third integers, the program segment will print YES. Otherwise, it will print NO.

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Part Two (50 points)

Answer three questions:

Question **4** (required question – 10 points)

and two of the questions **5-7** (each question – 20 points).

Answer Question **4 – required.**

4. A program segment written in Pascal is shown below.

Using a trace table [טבלת מעקב], follow the execution of the program segment for the input (in this order): 0, 2, 1, 6, 3, and write what will be printed.

```
READLN (A);
FOR I := 1 TO 4 DO
BEGIN
      READLN (N);
      A := A+N ;
      IF (A MOD 2 = 0 )
            WRITELN ('!!')
      ELSE
            WRITELN ('###');
END;
WRITELN ('A=', A ) ;
```

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Answer two of the questions 5-7.

5. Students in the Ayala School need to elect one of three candidates to head the student council.
For candidate 1, they type 1.
For candidate 2, they type 2.
For candidate 3, they type 3.
Write a program in Pascal that will accept as input the votes of the school's 125 students, and will print the number of the candidate who received the largest number of votes.
Assume that there is only one winner.

6. The management of the HaKol Tov factory wants its employees to travel less in their private cars. They decided that an employee who travels less than 1000 km a month will receive a bonus in his monthly salary.
Write a program in Pascal that will accept as input, for each of the 100 employees, the employee's name, and the total number of kilometers he traveled during the month. If the employee is eligible for the bonus, the program will print the message WELL DONE and the name of the employee.
The program will also print the number of employees eligible to receive a bonus and the number ineligible to receive a bonus.

7. A customer of the Kesher telephone company pays 2 shekels per minute for a call made overseas.
Write a program in Pascal that will accept as input, for each of the company's customers who made calls overseas, the customer's name and the total number of minutes that he talked. The input ends when ISRAEL CALL will be input as the customer's name.
For each customer, the program will print his name, calculate the amount he has to pay, and print it.
The program will also print the number of customers who made calls overseas and the total number of minutes of the calls made by all the customers.

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Part Three (20 points)

Answer one of the questions 8-9.

8. Given: a one-dimensional array ARR of size 200, which contains integers.
Write a program in Pascal that accepts as input a positive integer N that is smaller than 200.
The program will calculate the average of the numbers in the array, from the first element to the element in the Nth place in the array (inclusive), and the average of the rest of the elements of the array.
The program will print the greater of the two averages.
Note: You do not need to input the elements of the array.

9. Write a program in Pascal that will create 100 random positive integers smaller than 50, and place them into a one-dimensional array R of size 100.
The program will create an additional random positive integer NUM that is smaller than 30.
The program will print all the elements of the array that are greater than NUM and their sum.
If there are no elements in the array that are greater than NUM, the program will print 0.

Good Luck!