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Question 1: Answer the given questions according to following memory map.
[Marks: 1*5 = 5]

0700:0102	0B 12 91 4C 01 02 03 04-05 41 42 43 31 32 33 61
0700:0112	62 20 63 64 00 0A 00 0D-00 24 00 C3 90 90 90 90
0700:0122	90 90 90 90 90 90 90 90-90 90 90 90 90 90 90
0700:0132	F4 00 00 00 00 00 00 00-00 00 00 00 00 00 00

- If a number is read and stored in a 16-bit register from address 0700h: 010Fh, the contents of register (in hex) will be?
- If a number is read and stored in an 8-bit register from address 0700h: 010Ah, the contents of register (in hex) will be?
- If a number is read and stored in a 32-bit register from address 0700h: 0102h, the contents of register (in hex) will be?
- Tell the physical address of location where value 24h is stored.
- Tell the physical address of location where value 33h is stored.

Question 2: What will be the values of variables: VAR1, VAR2, and registers: AX, BP and SP after execution of line number 19 of the program given below:

[Marks: 5]

01 org 100h	
02 ;Assume offset starts at 0102h	VAR1 =
03 ;and initially sp is set to 0FFFFh	
04 .DATA	VAR2 =
05 VAR1 DW 0FE34H	
06 VAR2 DW 0910H	AX =
07 .CODE	
08 MAIN PROC	BP =
09 XOR AX, 0	
10 PUSH VAR1	SP =
11 PUSH OFFSET VAR2	
12 MOV BP, SP	
13 MOV BX, [BP]	
14 MOV AL, [BX]	
15 ADD AX, 10	
16 PUSH AX	
17 POP VAR2	
18 ADD [BP+2], 5	
19 MOV AX, [BP+2]	
20 RET	
21 MAIN ENDP	



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19      MOV AX, [BP+2]
20      RET
21      MAIN ENDP

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Question 03: For each of the following instructions, give the source offset address and the contents stored in the destination. Consider following initial values.

[Marks: 2*5 = 10]

AX = 0000h, DX = 0000h, BX = 0102h, DI = 0000h

ARR DW 'BC34', 0Ah, 57AEh

Note: The starting offset address of variable ARR is 0102h. Assume that all instructions are being executed in a sequence (i.e. dependent on previous register values).

No.	Instructions	Source Offset Address (in hex)	Contents stored (in hex)
	LEA BX, ARR + 3		
	MOV DI, BX		
	ADD AL, [DI + 1]		
	MOV DI, -2[BX]		
	SUB [BX], AX		

Question 04: Fill in the following table to show how register contents will be changed after execution of following instructions. Assume these initial values for each part: AX= 8D56h, BX= 34ECh and CF = 0.

Note: All instructions are NOT being executed in a sequence.

[Marks: 2*5 = 10]

No.	Instructions	Destination Contents (in hexadecimal)	CF
	SAR AX, 3		
	SHR BL, 3		
	RCR BX, 3		
	ROR BX, 3		
	RCL BX, 3		

Question 5: Write a recursive subroutine to find the product-fibonacci (PF(n)) of a number stored in AX register. The recursive formula is $PF(n) = PF(n-1) * PF(n-2)$ and base case is $PF(0)=1$ and $PF(1)=2$. For example,

$PF(2)=PF(1)*PF(2)$,
 $PF(3)=PF(2)*PF(1)=PF(1)*PF(0)*PF(1)=2*1*2=4$, so on and so far.

[Marks: 10]

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Question 6: Write a program that hooks the Timer interrupt and on it's each occurrence it moves a character 'A' towards right in next cell in the first row of VGA screen, circularly. Then hook the Keyboard interrupt to play/pause the movement of 'A'. On key press of 'P' it should pause the movement of 'A' and on pressing the same key it should again play the movement of 'A'. You can assume any scan code of 'P' for key press.

[Marks: 10]