

Arab Academy For Science and Technology & Maritime Transport

College of Engineering & Technology

Computer Engineering Department



EXAMINATION PAPER – Week 7

Course Title: System Programming

Course Code: CC410

Date: Mon. March, 23-2015

Lecturer: Dr. Manal Helal

Time allowed: 60 mins

Start Time: 2:30 p.m.

Student's name:

Reg.# :

Question #	Marks	
	Available	Actual
System Software	6	
Assembly	7	
Assembler	7	
Total	20	
Lecturer	Name : Dr. Manal Helal	
	Signature :	
	Date:	

Answer the following questions.

1) Which software is considered system software:

[2 marks]

- | | | |
|---------------------|---------------------|--------------|
| A. Compiler | B. Internet Browser | C. Photoshop |
| D. Operating System | E. Movie Maker | F. Assembler |
-

2) The SIC machine is:

[2 marks]

- A. A simple virtual machine that runs on any computer with a small instruction set.
- B. A sophisticated virtual machine that is capable of parallelizing code automatically.
- C. Is a set of embedded systems in a Robot that include motion control, weather, humidity and other sensors, vision and object recognition algorithms, and wireless communication.
- D. Is an application software that simulates motion of the planets in the different galaxies.
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3) Explain the instruction formats of the SIC/XE machine.

[2 marks]

4) Write a SIC or SIC/XE assembly code to calculate the following equation:

$$\text{alpha} = \text{beta} + ((\text{gamma} * \text{delta}) / \text{theta})$$

5) Compute the Location Counter and Object Code for the following SIC assembly code.

LOCCTR	Label	Operation	Operands	OPCODE
		START	2000	
		LDX	ZERO	
	LOOP	LDCH	STR1,X	
		STCH	STR2, X	
		TIX	COUNT	
		JLT	LOOP	
	STR1	BYTE	C>Welcome To System Programming'	
	STR2	RESB	29	
	ZERO	WORD	0	
	COUNT	WORD	29	

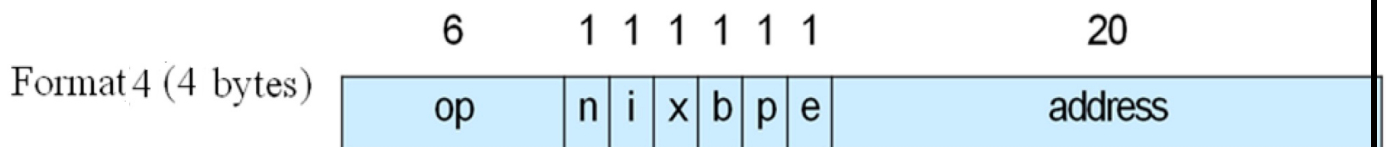
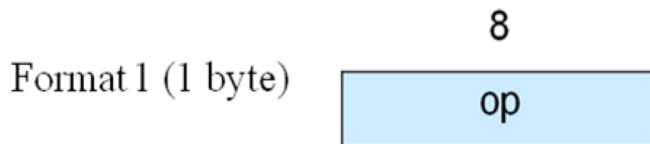
Fill the basic contents of the Symbol Table

Answers:

1. a, d, f

2. a

3.



4.

Label	Operation	Operands
	LDA	GAMMA
	MUL	DELTA
	DIV	THETA
	ADD	BETA
	STA	ALPHA
ALPHA	RESW	1
BETA	RESW	1
GAMMA	RESW	1
DELTA	RESW	1
THETA	RESW	

5.

LOCCTR	Label	Operation	Operands	OPCODE
2000		START	2000	
2000		LDX	ZERO	042061

2003	LOOP	LDCH	STR1,X	50A00F¹
2006		STCH	STR2, X	54A038²
2009		TIX	COUNT	2C2064
200C		JLT	LOOP	382003
200F	STR1	BYTE	C>Welcome To System Programming'	
2038	STR2	RESB	29	
2061	ZERO	WORD	0	
2064	COUNT	WORD	29	

Symbol Table

LOOP	2003
STR1	200F
STR2	2038
ZERO	2061
COUNT	2064

¹ : operand STR1 is in 200F (0010 0000 0000 1111), but the X flag is on (1010 0000 0000 1111) becoming A00F

² operand STR2 is in 2038(0010 0000 0011 1000) adding the X flag (1010 0000 0011 1000) becoming A038