

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF COMPUTER SCIENCE
FIRST SEMESTER 2009/2010 EXAMINATION

CSC 303 – ASSEMBLY LANGUAGE PROGRAMMING

INSTRUCTIONS: Answer ALL questions in SECTION A and any two questions in SECTION B

Duration: 2hrs 30mins

NO USE OF CALCULATOR

SECTION A

1. What is a flip-flop?
2. Convert the following to decimal: (i) $2A7.3E2_{16}$ (ii) 11111101_2 (iii) 111111_8
3. Find the binary equivalent of the following (i) -43_{10} (ii) 45.625_{10}
4. Evaluate the following expressions:
 - i. $76302.45_8 + 1000101_2$
 - ii. $0111_2 * 1110_2$
 - iii. $57.5_{oct} \times 7d.4_{hex}$
5. Convert the following binary numbers to the 2's complement form
 - (i) 10101111
 - (ii) $1000\ 0001$
6. Define byte, word and doubleword.
7. Convert the following decimal numbers into single-precision floating numbers
 - (a) -10.625
 - (b) $+1.5$
8. Why can't the parity method detect a double error in transmitted data?
9. A particular microcomputer can store an 8-bit number in each memory location. If the memory addresses range from 0000_{16} to $FFFF_{16}$. How many memory locations are there?
10. What is a Far Jump?
11. Which JMP instruction is five bytes long?
12. Which registers are placed on the stack by the PUSH instruction.
13. What is the purpose of the EQU directive?
14. Suppose that $DS = 1300H$, $SS = 1400H$, $BP = 1500H$ and $SI = 0100H$. Determine the address accessed by each of the following instruction, assuming a real mode operation:
 - (i) `MOV EAX, [BP + 200H]`
 - (ii) `MOV AL, [BP + SI - 200H]`
 - (iii) `MOV [BP + 2* SI], AX`
 - (iv) `MOV AH, SI`

15. What is a procedure?
16. What is the purpose of the .MODEL TINY statement?
17. The MOV instruction is placed in what field of a statement?
18. Explain the purpose of the following instruction set :
 (i) JO (ii) NEG (iii) LEA (iv) MOVS (v) INC (vi) DEC
19. What is a debugger? Mention and explain 3 commands to debug an assembly language program.
20. Explain what the IN AL, 12H instruction accomplishes
21. Use an assembler directive to store the ASCII character string ‘ What time is it? ’ in the memory.

22. Convert the following to assembly language instructions

$$Y = \frac{A + B}{\frac{W}{B + C^2} + \frac{M + 10}{K^2}}$$

23. Consider the following code segments

```

mov ax, 0
mov ecx, 5
L1:
inc ax
loop L1

```

What are the final values of **ax** and **ecx** when the loop ends?

24. Write a procedure that multiplies DI by SI and then divide the result by 100H. Store the result in AX.

SECTION B

Write an assembly language program to evaluate any 2 of the following:

1. The sum of squares from 20 to 50
2. $P = 1 + 1 + 2 + 3 + 5 + 8 + 13 + \dots$ up to the 20th number.
3. ${}^{10}C_3$

4. $\left[\begin{matrix} 10 \\ \sum_{i=1}^i \\ i=1 \end{matrix} \right] / 10$