BINGHAM UNIVERSITY KARU, NASARAWA STATE.
FIRST SEMESTER EXAMINATION 2019/2020 SESSION
DEPARTMENT OF COMPUTER SCIENCE

CMP 217 – Foundations of Sequential Programming **2 Credit Units**

Instructions: Answer *ALL* Questions.
Time: 2 Hours

1A. Discuss why machine code written for an intel Core i7 processor won't work on an ARMv8 processor. (5 marks)

1B. What is the difference between opcode and an operand? (3 marks)

1C. What is the difference between Instruction Set and an Instruction Register (5 marks)

1Cii. Using the leftmost bit as a sign bit, what is the equivalent of 1011 in decimal? (2 marks)

2A. Define the following terms;

i. Registers (3 marks)
ii. Program Counter (3 marks)
iii. Arithmetic and Logic Unit (3 marks)

2B. How many registers are available for manipulating data in a 32-bit system architecture. (1 mark)

2C. Discuss the differences and highlight the advantages of High-Level languages over machine Language. (5 marks)

3A. Explain the Fetch-Execute cycle. (8 marks)

3B. Compare and contrast the Hexadecimal and Binary number system (5 marks)

3C. What is the equivalent of 45 in Hexadecimal? (2 marks)

4A. A set of binary digits are grouped in nibbles to get the hexadecimal value of the bits, why? (5 marks)

4B. Write a short note on Assembly Language. (5 marks)

4C. Using the concept of Two's Complement, show that [15 + (-10)] = 5 (5 marks)

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FACULTY OF SCIENCE AND TECHNOLOGY

COMPUTER SCIENCE DEPARTMENT

FIRST SEMESTER EXAMINATIONS, FEBRUARY, 2019

200 LEVEL

CMP217 FOUNDATIONS OF SEQUENTIAL PROGRAMS

TIME ALLOWED: 2HRS

ANSWER question 1 and ANY 2 other questions

1. Complete the following table by filling in **all** the empty cells with the correct and appropriate answers. The first one has been done for you.

S/No.	Decimal Number	Binary Number	Octal Number	Hexadecimal Number
1	123	1111011	173	7B
2		1110111000011		
3	2019			
4				DEAF
5			165	
6	-471			
7				BEAD

Note: Show all working in order to obtain full marks.

2. (a) Express the decimal number 3217 in the Binary Coded Decimal.
   (b) Distinguish between the EBCDIC, and UNICODE text codes.
   (c) Why are the text codes essential to Computer Operations?

3. (a) Distinguish among Machine Language, Assembly Language, and High Level Language, giving 3 Merits **and** 3 demerits of each
   (b) Why is necessary for a programmer to have some good knowledge of the Assembly language?

4. (a) What is a Microprocessor?
   (b) (i) What is a register?
   (ii) How does it differ from and a RAM?
   (c) List the general-purpose registers and
   (d) list the special-purpose registers in Intel 8088 processor.
   (e) What purpose is served by the following registers?
   (i) program counter
   (ii) status register
   (iii) AX register
   (f) what is the difference between the AX register and the EAX register?

5. (i) Using relevant examples explain why the number of bits for a code limits the number of characters that can be coded.

(ii) Do these octal additions

(a) 27 + 53

(b) 46 + 675

(iii) Do these Hexadecimal additions

(a) D5F + 4AC

(b) BCA + E23

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FIRST SEMESTER EXAMINATIONS, FEBRUARY, 2017

200 LEVEL

CMP209INTRODUCTION TO OPERATIONS RESEARCH

TIME ALLOWED: 2HRS

Answer 3 questions in all:

You are to answer **one** question from **SECTION ONE** and any **two** questions from **SECTION TWO**

SECTION ONE

1. (a) i. Briefly trace the history of Operations Research.
   ii Give any three definitions of Operations Research as a decision-making science and explain them.
   (b) 'Linear programming has no real-life applications'. Do you agree with this statement? Discuss.
   (c) Explain briefly the following with relevant examples:

   (i) Optimal Solution (ii) Objective function (iii) Feasible region.

2. Solve the following Linear Programming problem using the **Algebraic** Method.

   Maximize $Z = 5x_1 + 6x_2$
   Subject to:

   $$2x_1 + 3x_2 \leq 18$$
   $$2x_1 + x_2 \leq 12$$
   $$3x_1 + 3x_2 \leq 24$$

   and $x_1, x_2 \geq 0$

SECTION TWO

3. Solve the following Linear programming problem using the **graphical** method.
   Maximize $Z = 15x_1 + 18x_2$
   Subject to

   $$6x_1 + 6x_2 \leq 48$$
   $$4x_1 + 2x_2 \leq 24$$
   $$10x_1 + 15x_2 \leq 90$$

   and $x_1, x_2 \geq 0$

Note: you are to **shade completely** the feasible region and **state the optimal value** of the objective function.

4. A firm has the following materials available for production of **product A** and **product B**: 300 square metres of flat iron sheets, 240 square metres of flat aluminium sheets and 150 square metres of flat bronze sheets. **Product A** requires the following: 3 square metres of flat iron sheets,2 square metres of flat aluminium sheets and1 square metre of flat bronze sheet. **Product B** requires 2 square metres of flat iron sheets, 3 square metres of flat aluminium sheets and 2 square metres of flat bronze sheets.
   (a) If the gross profit realized from a piece of PRODUCT A is N1500.00 and the gross profit from PRODUCT B is N1000.00, how many of each PRODUCT should the firm make in order to obtain maximum profit?
   (b) How much is the maximum profit?

5. Petrobiz is building a refinery to produce four products: diesel, petrol lubricants and jet fuel. The minimum demand (in barrels per day – bbl/day) for each of these products is 14,000, 30,000, 10,000, and 8000, respectively. Nigeria and Libya are under contract to ship crude oil to Petrobiz. Because of the production quotas specified by OPEC (Organization of Petroleum Exporting Countries), the new refinery can receive at least 40% of its crude from Nigeria and the remaining amount from Libya. Petrobiz predicts that the demand and crude oil quotas will remain steady over the next ten years.

   The specifications of the two crude oils lead to different product mixes. One barrel of Nigeria crude yields 0.2 bbl of diesel, 0.25 bbl of petrol,, 0.1 bbl of lubricant, and 0.15 bbl of jet fuel. The corresponding yields from Libya crude are0.1, 0.6, 0.15, and 0.1 respectively. Petrobiz needs to determine the minimum capacity of the refinery (in bbl/day).

Computer Science Department,
Faculty of Science and Technology,
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CMP 217 Foundation of Sequential Program
End of Semester First Examination.
Time Allowed 2 Hours. Answer ALL questions.

1. With the aid of a diagram show the Von Neumann architecture scheme of a computer system.
2. Explain the following with examples:
   a. Assembler.
   b. Compiler.
   c. Interpreters
3. a. Why do you need a translator program?
   b. What are the functions of the following in the compilation process?
      i. Dictionary procedure.
      ii. Error Handler.
4. a. What are the advantages and disadvantages of High level languages?
   b. Contrast between compilers and Interpreters.
5. a. A modern assembler has two inputs and two outputs. List them.
   b. What are the functions of a loader?
6. What are the advantages and disadvantages of having a dual assembler loader?
7. a. What are the four main functions of a computer?
   b. What are the major structural components of the CPU?
8. a. Explain fully what you understand by Instruction Set Architecture (ISA).
   b. With examples list the typical categories of instructions.
9. a. What does the instruction IX7 X2+X5, on the CDC Cyber computers means?
   b. Explain the following assembler instruction, indicating the four fields in the cycle.
      LOOP ADD R1,ABC PRODUCING THE SUM
10. With the aid of a diagram show the process for producing an executable file in an assembler.

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FIRST SEMESTER EXAMINATION, 2015/2016 SESSION

COURSE TITLE: FOUNDATION OF SEQUENTIAL PROGRAMMING
COURSE CODE: CMP 217 **COURSE CREDIT UNITS:** 2
TIME ALLOWED: 2HRS
INSTRUCTION: ANSWER ANY THREE QUESTIONS

1. (a) Explain sequential programs. Your explanation should contain its features and a sample program using any language.
   (b)(i) Using a hierarchical format list the four categories of programming languages.
   (ii) Explain how the computer works with major focus on main memory, processor and registers.
   (c) Explain exchange instruction

2. (a)(i)Explain assembly language.
   (ii) Differentiate between machine code and assembly language.
   (b)(i) List and explain the forms of operands
   (ii)Represent the following expression using assembly language syntax.
   $$Z=(A+B)\div(D-50)$$
   NB: Comment on each
   (c)(i) Convert the following hexadecimals to binary digits
   i. CCDD
   ii. FFFF
   iii. 12AD
   iv. EF34
   (ii) Convert the following decimal numbers to hexadecimals.
   i. 128
   ii. 512
   iii. 65535
   iv. 1550

3. (a) Explain Scope and its relationship with closure. Provide a sample code to aid in the explanation.
   (b)(i)What is the TIMES directive used for?
   (ii)Outline the reserve directives in assembly language and highlight their functions.
   (c)(i) Differentiate between executable instructions and assembler directives
   (ii) Define variables

4. (a)(i)What do you understand by Endian?
   (ii) Differentiate between big endian and little endian
   (b)(i) Explain the Byte swap instruction
   (ii) List 4 characteristics of machine language

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