POKHARA UNIVERSITY

Level: Bachelor Semester: Spring Year : 2019
Programme: BE Full Marks: 100
Course: System Programming Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Write about instruction formats and addressing modes of SIC/XE. Identify the addressing mode and target address if the instruction is 012030 {PC=2000, B=5030, X=3000} 7
   b) Explain the importance of system software. How it differs from application software? 4
   c) Explain VAX, RISC and CISC architecture. 4
2. a) What is one-pass and Multi-pass Assembler? Which one do you prefer while designing an assembler? Justify your answer. 5
   b) Consider the following assembly language program. 10

Line	Symbol	Opcode	Exp
10	Test	START	0
20		EXTDEF	Odev
30		EXTREF	Ch, Phash
40	Begin	LDA	=C'#'
50		+STA	Ch
60		+JSUB	Phash
70		LTORG	
80	Odev	BYTE	X'06'
90	Phash	CSECT	
100		EXTDEF	Ch
110		EXTREF	Odev
120	Loop	+TD	Odev
130		JEQ	Loop
140		LDCH	Ch
150		+WD	Odev
160		RSUB	
170	Ch	RESB	1
180		END	Begin

Mnemonic	Opcode
JEQ	30
JSUB	48
LDA	00
LDCH	50
STA	0C
TD	E0
WD	DC
RSUB	4C

   i. Fill column for location counter
   ii. Create object code column with object codes
   iii. Show all data structures
   iv. Create Object code file.

   c) Explain literal and its handling in pass 1 and pass 2 5
3. Consider the following assembly language program. 15

Line	Symbol	Opcode	Exp
10	STRCPY	START	1000
20	FIRST	LDX	ZERO
30	MOVECH	LDCH	STR1,X
40		STCH	STR2,X
50		TIX	ELEVEN
60		JLT	MOVECH
70	STR1	BYTE	C'ABCD'
80	STR2	RESB	11
90	ZERO	WORD	0
100	ELEVEN	WORD	11
110		END	FIRST

Mnemonic	Opcode
LDCH	50
LDX	04
STCH	54
JLT	38
TIX	2C

   i. Fill column for location counter
   ii. Create object code column with object codes
   iii. Create Object code file.
   iv. Load the program in memory
4. a) What is Macro definition and Expansion? Explain with Example. 5

b) Consider the macro definition given below and show macro expansion for the macro call statement "Display 69 F8". Show all data structures used by macro processor clearly. 5

Print	MACRO	&Ch, &Od
$Repeat	TD	&Od
	JEQ	$Repeat
	LDCH	#&Ch
	WD	&Od
	MEND	

c) Explain Machine independent Macro processors Features. 5

5. a) Explain the interaction diagram for assembler with diagram. 8
   b) What is object oriented programming? Write about principles of object oriented programming. 7
6. a) Define Booch's Micro and Macro process activities. 5
   b) Differentiate linking loader from linkage editors. 5
7. Write short notes on: **(Any two)** 2×5
   a) Absolute Loader and its algorithm
   b) Conditional macro expansion
   c) Dynamic Linking