BTS-V(SS)-09-22-1061 Reg. No. | | | | | | | | | B

B.Tech. Degree V Semester Special Supplementary Examination September 2022

CS 19-202-0502 SYSTEM PROGRAMMING

(2019 *Scheme*)

Time: 3 Hours Maximum Marks: 60

Course Outcomes

On successful completion of the course, the students will be able to:

CO1: Familiarise the basics of system programs like assemblers, macro processors, linkers, loaders and operating systems.

CO2: Design, analyze and implement one pass, two or multi pass assembler.

CO3: Design and implement macro processors, linkers and loaders.

CO4: Compare different types of operating systems

Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 –Analyze, L5 – Evaluate, L6 – Create

PO – Programme Outcome

PART A

(Answer *ALL* questions)

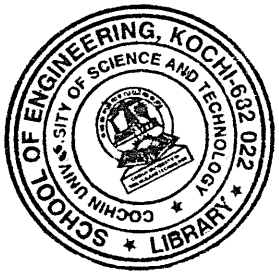
			(8 × 3 = 24) Marks	BL	CO	PO
I.	(a)	Discuss assemblers. List the functions of an assembler	3	L1	1	1
	(b)	Explain the significance of SYMTAB and OPTAB in assemblers.	3	L2	2	1
	(c)	Discuss the design of absolute programs	3	L2	2	1,2
	(d)	Compare linking loader and linkage editor	3	L2	2	1
	(e)	Discuss on macro. How is it different from a subroutine?	3	L1	3	2
	(f)	Discuss on conditional macro expansion	3	L2	3	1
	(g)	Discuss on run-time environment and user-interfaces	3	L1	4	1
	(h)	Elucidate on virtual machines.	3	L2	4	1

PART B

(4 × 12 = 48)

II.	(a)	Discuss how forward references are handled in a one pass assembler.	4	L2	1	2,3
	(b)	Generate the object code for the following SIC/XE program. Given that: CLEAR = B4, LDA = 00, LDB = 68, ADD = 18, TIX = 2C, JLT = 38, STA = 0C.	8	L3	1	2,3

```
FIRST   START   1000
        LDA     #0
        +LDB    #TOTAL
LOOP    ADD     TABLE
        TIX     COUNT
        JLT     LOOP
        STA     TOTAL
COUNT   RESW    1
TABLE   RESW    2000
TOTAL   RESW    1
        END     FIRST
```



OR

III.	(a)	Discuss on machine independent assembler features.	5	L2	1	1
	(b)	Discuss the algorithm for a two pass assembler with the necessary data structures.	7	L2	1	2

(P.T.O.)

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			Marks	BL	CO	PO
IV.	(a)	An SIC program is loaded in a location different from the starting address specified in the program. Will the program work properly? Justify your answer.	5	L2	2	3
	(b)	Discuss the algorithm and necessary data structures for linking loaders.	7	L2	2	2
		OR				
V.	(a)	Is there a need to use modification records for the given SIC/XE program segment? Explain your answer. If yes, show the contents of modification record.	5	L3	2	2

```
0000    COPY      START   0
.....
0006              +JSUB   RDREC
000A              LDA     LENGTH
.....
0033    LENGTH    RESW    1
.....
1036    RDREC     CLEAR   X
```

	(b)	Discuss on the design of bootstrap loaders	7	L2	2	1
VI.	(a)	Discuss on the algorithm for a single pass macro processor with the different data structures.	9	L2	3	2
	(b)	Discuss how nested macro definitions are handled	3	L2	3	2
		OR				
VII.		Discuss on machine independent macro-processor features.	12	L2	3	1
VIII.	(a)	Compare multiprocessor operating system and distributed operating systems.	6	L2	4	1
	(b)	Discuss on the functions of an operating system.	6	L2	4	1
		OR				
IX.	(a)	Discuss on object oriented operating systems.	6	L2	4	1
	(b)	Discuss on the different types of Operating systems.	6	L2	4	1

Bloom's Taxonomy Levels
L1 = 13%, L2 = 78%, L3 =9%.

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