R22 Regulation *Subject code: 4E3HB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Regular/Supplementary Examinations, December 2024

COMPUTER ORGANIZATION & OPERATING SYSTEMS

(CSE(DS))

Maximum Marks: 60 Date:11.12.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A	CO	Bloom Tx
All the following questions carry equal marks	(10X1M=10 Marks)		
1.a)	Write micro-operations for subroutine call and return	1	L1
b)	Differentiate Hardwired control unit and Micro-programmed control unit.	1	L1
c)	Write Signed magnitude, signed 1's complement and Signed 2's complement representations for the number -18	2	L1
d)	Define Cache.	2	L1
e)	Define Memory Access Time (MAT).	3	L1
f)	Define MDR and MAR.	3	L1
g)	Name one CPU scheduling criteria.	4	L1
h)	What does multiple-processor scheduling involve?	4	L1
i)	Write the directory structure in file systems?	5	L1
j)	What does the 'open' system call do?	5	L1
	Part-B		
Answer All the following questions.	(5X10M=50Marks)	CO	Bloom Tx
2	a) List out the Register transfer notations for Arithmetic Micro Operations. [5M] b) Design and implement 4-bit Arithmetic unit which performs ADD, ADD with carry, SUB, Sub with borrow, Increment and decrement operations. [5M]	1	L1
	OR		
3	Discuss in detail arithmetic micro- operations, Logic Micro-Operations, shift micro-operations, Arithmetic Logic Shift Unit. [10M]	1	L2
4	Explain with neat diagram, the address sequencing for control memory. [10M]	2	L5
	OR		
5	Write the symbolic micro program for the following. a. Store routine [5M] b. Indirect routine [5M]	2	L1

6	Explain peripheral devices and its components. [10M]	3	L2
	OR		
7	What is DMA? Draw the block diagram of DMA controller and explain the use of DMA controller in a computer system. [10M]	3	L1
8	Explain the different structures of operating systems such as simple batch, multi programmed, and time-shared systems. [10M]	4	L5
	OR		
9	Define critical regions and monitors and explain how they are used in synchronizing access to shared resources between processes [10M]	4	L1
10	Elaborate on the different system calls such as open, create, read, write, close, lseek, stat, and ioctl, and explain how they are used in file system operations. [10M]	5	L2
	OR		
11	Define contiguous allocation and discuss its role in memory management. [10M]	5	L1