R20 Regulation *Subject code: 3P4EB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Regular/Supplementary Examinations, September 2023

Computer Organization and Architecture

(Computer Science & Engineering)

Maximum Marks: 70 Date:15.09.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Mention the different functional units of a digital computer system.
2 At the end of a memory read operation, the MDR is loaded with a binary combination, how that combination is interpreted as an instruction or an operand to an instruction?
3 What are the different phases in an instruction cycle?
4 Mention the importance for memory segmentation.
5 How can we speed up the multiplication process?
6 What is the purpose of guard bits used in floating point arithmetic?
7 List out the importance of interfacing.
8 What are the differences between caches and virtual memory?
9 What is parallel processing?
10 Give the importance of multiprocessor.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 A. Explain the basic components of Generic Computing system regardless of its internal architecture with practical real time examples. (5M)
B. Explain the phases involved in Instruction cycle with the help of necessary timing diagrams. (5M)

OR

12 With a neat block diagram, explain about Input – Output and Interrupts. (10M)

13 A. List the basic computer registers with their bit size, register name and functionality. (5M)
B. Write the differences between Hardwired Control and micro programmed control. (5M)

OR

14 A. Draw and explain the flag register of 8086 microprocessor. (5M)
B. Explain the functionality of pins used in Minimum mode of 8086 μP. (5M)

15 A. Write the Division algorithm and explain with an example. (5M)
B. With a neat diagram explain floating point addition and subtraction unit. (5M)

OR

16 What are the different data transfer and data manipulation instructions. Explain with example. (10M)

17 A. Elaborate how DMA bypasses CPU and speeds up the memory operation. (3M)
B. With a neat schematic, Explain about DMA controller and its mode of data transfer. (7M)

OR

18 A. Write about Auxiliary memory devices. (5M)
B. Discuss the Memory Hierarchy in computer system with regard to Speed, Size and Cost. (5M)

19 A. Elaborate the major difficulties that cause the instruction pipeline to deviate from its normal operation. (5M)
B. What is the difference between RISC and CISC in computer organization? (5M)

OR

20 Explain inter processor communication and synchronization in a shared multiprocessor environment. (10M)