

U.G. 2nd Semester Examination - 2020**COMPUTER SCIENCE****[HONOURS]****Course Code : CMSH/CCL-204-T**

Full Marks : 60

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***GROUP-A**1. Answer any **ten** questions from the following:

2×10=20

- a) What are the disadvantages of sign magnitude representation?
- b) Give two examples of CISC machine.
- c) How EX-OR gate can be used as magnitude comparator?
- d) Where are the operands looked in for register addressing mode?
- e) What is the main job of interrupt system?
- f) What is the function of SCSI bus?

- g) What is dirty bit?
- h) Give two examples of input peripherals.
- i) What is instruction format?
- j) What do you mean by rotational delay?
- k) What is the function of memory buffer register?
- l) What is bus arbitration?
- m) What is the minimum and maximum number that can be represented by 2's complement representation?
- n) What do you mean by effective address?
- o) Give two examples of external I/O interface.

GROUP-BAnswer any **four** questions from the following: 5×4=20

2. a) Express the floating point number (-1.5) in IEEE 754 for 32 bit format. 2
- b) What is micro-instruction and micro-operation? $1\frac{1}{2} + 1\frac{1}{2}$
3. a) Draw a neat diagram and explain the traditional bus interconnection design of a basic computer. 3

[Turn over]

- b) What are the main advantages of multiple bus organization over single bus organization? 2
4. a) 'Auxiliary memory access time is generally 1000 times greater than that of the main memory' –justify. 2
- b) What is cache hit? Write down the formula for hit ratio. 2+1
5. a) Discuss the various modes of I/O data transfer. Which one offers the highest speed for I/O data transfer? 3+1
- b) What is the function of interrupt request line? 1
6. Evaluate the given expression, $X=(A+B)*(C+D)$ using:
- a) three address instructions
- b) two address instructions 2+3
7. Assume the numbers are represented in 8-bit 2's complement representation. Show the calculation of the following: $2\frac{1}{2} + 2\frac{1}{2}$
- a) $6 + 13$
- b) $6 - 13$

GROUP-C

Answer any **two** questions from the following: $10 \times 2 = 20$

8. a) Show how the following floating point multiplication is performed using Booth's algorithm:
 $(-5) \times 3$ 4
- b) Draw the instruction cycle and explain how multiple interrupts are handled by the instruction cycle. 2+1
- c) Draw and explain the timing diagram for system bus read cycle. 3
9. a) What are the disadvantages of pipeline? 2
- b) What is the difference between instruction pipeline and arithmetic pipeline? 3
- c) A processor has 40 distinct instructions and 24 general purpose registers. A 32-bit instruction word has an opcode, two registers operands, and an immediate operand. Calculate the number of bits available for the immediate operand field. 5
10. a) What are the major functions of input-output module? 4

- b) A computer has an 8 GB memory with 64-bit word sizes. Each block of memory stores 16 words. The computer has a direct mapped cache of 128 blocks. The computer uses word level addressing. What is the address format? If we change the cache to a 4-way set associative cache, what is the new address format?

3+3

11. Write short notes on any **two** of the following:

5×2

- a) PCI
 - b) Associative Memory
 - c) Stack Organization
 - d) RAID
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