





12. a) Mr. John has been assigned a project by his Team Leader in ALS Technologies. His project is to design an algorithm for two's complement division using addition and subtraction operations. Help Mr. John in designing an algorithm by sketching the flowchart for restoring division and also check the working of it with the following numbers :  $21 \div 4$ .

(OR)

- b) Mr. David is Processor Designer at IBM and he is visiting your college for an internship interview. During the interview Mr. David asks you to sketch the flow chart for floating point multiplication and also check the working of it with the following numbers :  $X = 4.5_{(10)}$  and  $Y = 11.25_{(10)}$ . Provide an appropriate solution.

13. a) Explain data path and its control in detail.

(OR)

- b) What is pipelining ? Discuss about pipelined data path control.

14. a) Discuss about SISD, MIMD, SIMD, SPMD and vector systems.

(OR)

- b) What is hardware multithreading ? Compare and contrast fine grained multi-threading and coarse grained multi-threading.

15. a) Consider a cache of 256 blocks in size, each block has  $2^4$  words. The main memory size is  $2^{12}$  blocks, each block has  $2^4$  words. How many bits are required for each of the TAG, SET/BLOCK and WORD FIELDS for different mapping techniques ? Wherever needed assume that there are 8 ways in each set.

(OR)

- b) Consider a system which transfers 2 MB file from memory to pendrive.

- i) If memory is using Handshaking Protocol to send the file, depict clearly how the data transfer takes place in case of source initiated and destination initiated data transfer. (7)

- ii) When the file is being transferred there should be minimal intervention of the processor. Suggest a suitable technique for the above operation and explain it with proper justification and diagrams. (6)

PART – C

(1×15=15 Marks)

16. a) What is an addressing mode ? Explain the various addressing modes with suitable examples.

(OR)

- b) Explain in detail about centralized shared memory and distributed memory multiprocessor.
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