Q.2 a. Give a short sequence of machine instructions for the task: " Add the contents of memory location A to those of location B, and place the answer in location C".
Instructions
Load LOC, R_i
and
Store R_i, LOC
are the only instructions available to transfer data between the memory and general purpose register R_i.

Answer: Refer Section 1.3, Page 7 of Text Book-I

b. What are condition code flags? Explain any three commonly used flags.

Answer: Refer Section 2.4.6, Page 46 of Text Book-I

Q.3a. The subroutine call instruction of a computer saves the return address in a processor register called the link register, RL. What would you do to allow subroutine nesting? Would your scheme allow the subroutine to call itself?

Answer: Refer Section 2.9, Page 72 of Text Book-I

b. What do you understand by the data structures stack and queue? Explain how data is organized in computer memory as a stack? Also write two important differences between stack and queue implementation.

Answer: Refer Section 2.8, Page 68 of Text Book-I

Q.4a. What do you understand by interrupt? What is the difference between a subroutine and interrupt-service routine?

Answer: Refer Section 4.2, Page 208 of Text Book-I

b. What is bus protocol? Also explain the difference between synchronous bus and Asynchronous bus.

Answer: Refer Section 4.5, Page 240 of Text Book-I

Q.5a. Define I/O interface. What are the functions of an I/O interface?

Answer: Refer Section 4.6 page 248 of text book-I

b. List out the various interface standards that may be used in computer system with the help of a diagram.

Answer: Refer Section 4.7 page no 259 of text book-I
Refer Diagram 4.38 page no 260 of text book-I

Q.6a. Explain the addressing scheme in computer memory. Also explain how data transfer takes place between memory and processor.

Answer: Refer Section 5.1 page no 292 & 293 of text book

b. Explain the designs of various Read-only memories.

Answer: Refer Section 5.3.1, 5.3.2, 5.3.3, 5.3.4 page no 311, 312, 313 of text book

Q.7a. Explain with the help of a diagram virtual memory organization.

Answer: Refer Section 5.7 page no 337 of text book
5.26 diagram no 338 diagram

b. A disk unit has 24 recording surfaces. It has a total of 14000 cylinders. There is an average of 400 sectors per track. Each sector contains 512 bytes of data.

(i) What is the maximum number of bytes that can be stored in this unit?

(ii) What is the data transfer rate in bytes per second at a rotational speed of 7200 rpm?

(iii) Using a 32-bit word, suggest a suitable scheme for specifying the disk address, assuming that there are 512 bytes per sector.

Answer: Refer Section 5.9.1 page no 347 of text book

Q.8a. Using manual methods, perform the operations $A \times B$ and $A \div B$ on the 5-bit unsigned numbers $A = 10101$ and $B = 00101$

Answer: Refer Section 6.3 & 6.4 page 405 of text book

b. State the rules of arithmetic operations on floating point numbers.

Answer: Refer Section 6.7.2 page 398 of text book

Q.9a. Describe how a processor executes instructions. Explain it with the help of a diagram? (

Answer: Refer Section 7.1 page 412 & 413 of text book

b. Draw and explain the block diagram of a complete processor.

Answer: Refer Section 7.14 page 429, 7.4.1 of 428 text book

Text Book

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, 5th Edition, TMH, 2002