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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017**

**Course Code: CS202****Course Name: COMPUTER ORGANISATION AND ARCHITECTURE (CS, IT)**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions. Each carries 3 marks.*

- 1 Differentiate between big-endian and little-endian byte assignments. (3)
- 2 Design a 2x2 array multiplier. (3)
- 3 Describe auto increment addressing mode with the help of an example. (3)
- 4 Give the control sequence for execution of instruction Add[R2],R1 using a single bus organization. (3)

**PART B***Answer any two questions. Each carries 9 marks.*

- 5 a) Describe, with proper examples, the role of processor stack in subroutine call and return. (5)
- b) Draw the flowchart for decimal multiplication. (4)
- 6 a) Explain restoring method of division with the help of a flow chart. (5)
- b) Write notes on three address, two address and one address instructions, giving example for each. (4)
- 7 a) Explain single bus organization with the help of a diagram. Specify with examples, how memory operations are done in the given organization. (5)
- b) Describe any 4 addressing modes with examples. (4)

**PART C***Answer all questions. Each carries 3 marks.*

- 8 What are vectored interrupts? (3)
- 9 Write notes on flash memory. (3)
- 10 Briefly explain the LRU cache replacement algorithm (3)
- 11 Describe centralized bus arbitration. (3)

**PART D***Answer any two questions. Each carries 9 marks.*

- 12 a) Explain the architecture of USB with a diagram. What do you mean by split bus operation in USB? (5)
- b) Write notes on static memories. (4)

- 13 a) Differentiate between associative and set associative cache mapping with examples. (5)  
b) Write notes on interrupt nesting. Explain how simultaneous interrupt requests can be handled. (4)
- 14 a) Discuss about the different types of Read only memories. (4)  
b) Explain with the help of timing diagrams, the input and output data transfers in an asynchronous bus. (5)

**PART E**

*Answer any four questions. Each carries 10 marks.*

- 15 a) Design a bus system for interconnecting four n bit registers (5)  
b) Design a 4bit combinational logic shifter (5)
- 16 a) Briefly explain, with diagrams, the different methods for control organization (5)  
b) Write notes on microprogrammed CPU organisation. (5)
- 17 a) Design an adder/subtractor circuit with one selection variable s and two inputs A and B. When s=0, the circuit performs A+B and when s=1 it performs A-B, by taking 2's complement of B. (5)  
b) Write notes on status register. (5)
- 18 a) Describe the different ways in which a general-purpose processor unit can be organized. (6)  
b) Write notes on conditional control statements. (4)
- 19 Explain with the help of a diagram, the working of microprogram sequencer. (10)
- 20 Describe the steps in control logic design with the help of an example. (10)  
(Example can be realised using either hardwired or microprogrammed control organization.)

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