Table 3.5 *Function Table for ALU*

S_3	S_2	S_1	S_0	C_{in}	*Output (F)*	*Operation*
0	0	0	0	0	F = A + B	Addition
0	0	0	0	1	F = A + B + 1	Addition with carry
0	0	0	1	0	F = A + B′	Subtraction with borrow
0	0	0	1	1	F = A + B′ + 1	Subtraction
0	0	1	0	0	F = A – 1	Decrement A
0	0	1	0	1	F = A	Transfer A
0	0	1	1	0	F = A	Transfer A
0	0	1	1	1	F = A + 1	Increment A
0	1	0	0	x	F = A ∧ B	AND
0	1	0	1	x	F = A ∨ B	OR
0	1	1	0	x	F = A ⊕ B	XOR
0	1	1	1	x	F = $\overline{A}$	Complement of A
1	0	0	x	x	F = lsr A	Shift right A into F
1	0	1	x	x	F = lsl A	Shift left A into F

REVIEW QUESTIONS

Group A

1. Choose the most appropriate option for the following questions:
   (i) Microoperation in computers is an operation
   (a) in ALU (b) on stored data in register
   (c) in control unit (d) performed by the operating system.
   (ii) A register is
   (a) a part of main memory (b) a part of CPU
   (c) collection of flip-flops (d) Both (b) and (c).
   (iii) The address of the next instruction to be executed is held by
   (a) AC (accumulator) register (b) IR (instruction register)
   (c) PC (program counter) register (d) SP (stack pointer).
   (iv) A bus in the computer system is
   (a) collection of some individual lines each is used to send a bit randomly
   (b) collection of parallel lines each is used to send one bit synchronously
   (c) collection of lines through which control signals are sent
   (d) collection of lines through which data are sent.
   (v) To construct an n-line common bus using MUX for k registers of n bits each, the number of MUXs and size of each MUX are
   (a) k and n × 1 (b) n and 2^k
   (c) n and k × 1 (d) k and 2^n, respectively.
   (vi) To construct an n-line common bus using tri-state buffers for k registers of n bits each, the number of buffers and size of common decoder are
   (a) n and $\log_2$k-to- k (b) n*k and $\log_2$n-to- n
   (c) k and $\log_2$n-to- n (d) k*n and $\log_2$k-to- k, respectively.