PART A: OBJECTIVE QUESTIONS (20 MARKS)

1. Which of the following is NOT part of computers classification by size and power?
A. Personal computer
B. Printer
C. Workstations
D. Supercomputer

2. Computer organization refers to:
A. Physical aspects
B. Logical aspects
C. Data types
D. Instruction set

3. Which of the following is TRUE about computer family?
A. Same organization but different architecture
B. Same architecture but different organization
C. Same organization and same architecture
D. Different architecture and different organization

4. The structure of the computer describes
A. the way each component operate.
B. the way components are interrelated.
C. how IBM design its CPU.
D. the way OS interact with application programs.

5. Which of the following is NOT part of computer function?
A. Control
B. Data storage
C. Memory size determination
D. Data processing

6. Which statement is FALSE for software program execution approach?
A. Build into (wired into) computer hardware.
B. Control signals through instruction codes.
C. Need an interpreter to “speak machine”
D. While less speed, it is easily reprogrammable

7. Which of the following is a characteristic of Von Neumann computer model?
A. Stored program
B. Quad processor
C. Genetic computer
D. Parallel processing

8. Which of the following is NOT part of computer level hierarchy?
A. Digital logic level
B. Assembly language level
C. Machine level
D. Design level

9. Signed numbers are represented as follows EXCEPT:
A. Signed magnitude
B. One's complement
C. Most significant bit
D. Two's complement

10. What is the decimal equivalent of the 8-bit two's complement number 1110 1101?
A. -237
B. -19
C. -18
D. 237

11. Give the result for $32_{10} - 40_{10}$ in 8-bit two's complement representation.
A. 1111 0111
B. 0000 0111
C. 0000 1000
D. 1111 1000

12. Which statement is TRUE for detecting overflow?
A. Adding two positive numbers gives a positive result
B. Adding two positive numbers gives a negative result
C. Adding two negative numbers gives a negative result
D. Adding a positive and a negative number gives a positive result

13. The ISA Level defines the interface between
A. users and system software
B. application software and compilers
C. compilers and hardware
D. operating system and compilers

14. An instruction set does NOT always include:
A. source counter
B. source operand
C. destination operand
D. operation code (opcode) / mnemonic

15. Source and result operand in instruction could be the following EXCEPT:
A. immediate
B. CPU registers
C. main memory
D. RISC

16. In immediate addressing mode, the value of the operand is
A. In a register
B. In a memory location
C. In a memory location pointed by the content of a register
D. In the address field of the instruction

17. What is the size of EAX register?
A. 32 bit
B. 16 bit
C. 8 bit
D. 64 bit

18. Which of the following is TRUE about the instruction pointer register?
A. Holds individual bits that reflect outcome of some CPU operations
B. Holds individual bits that control CPU operation
C. Holds the address of next instruction to be executed
D. Holds the next operand to be executed

19. Given the instruction ADD AX, [[OP1]] what kind of addressing mode does the instruction use?
A. Immediate
B. Indirect
C. Stack
D. Displacement

20. The format of the ISA shown below is known as:

Opcode (8 bits)	Operand Reference (12 bits)	Operand Reference (12 bits)

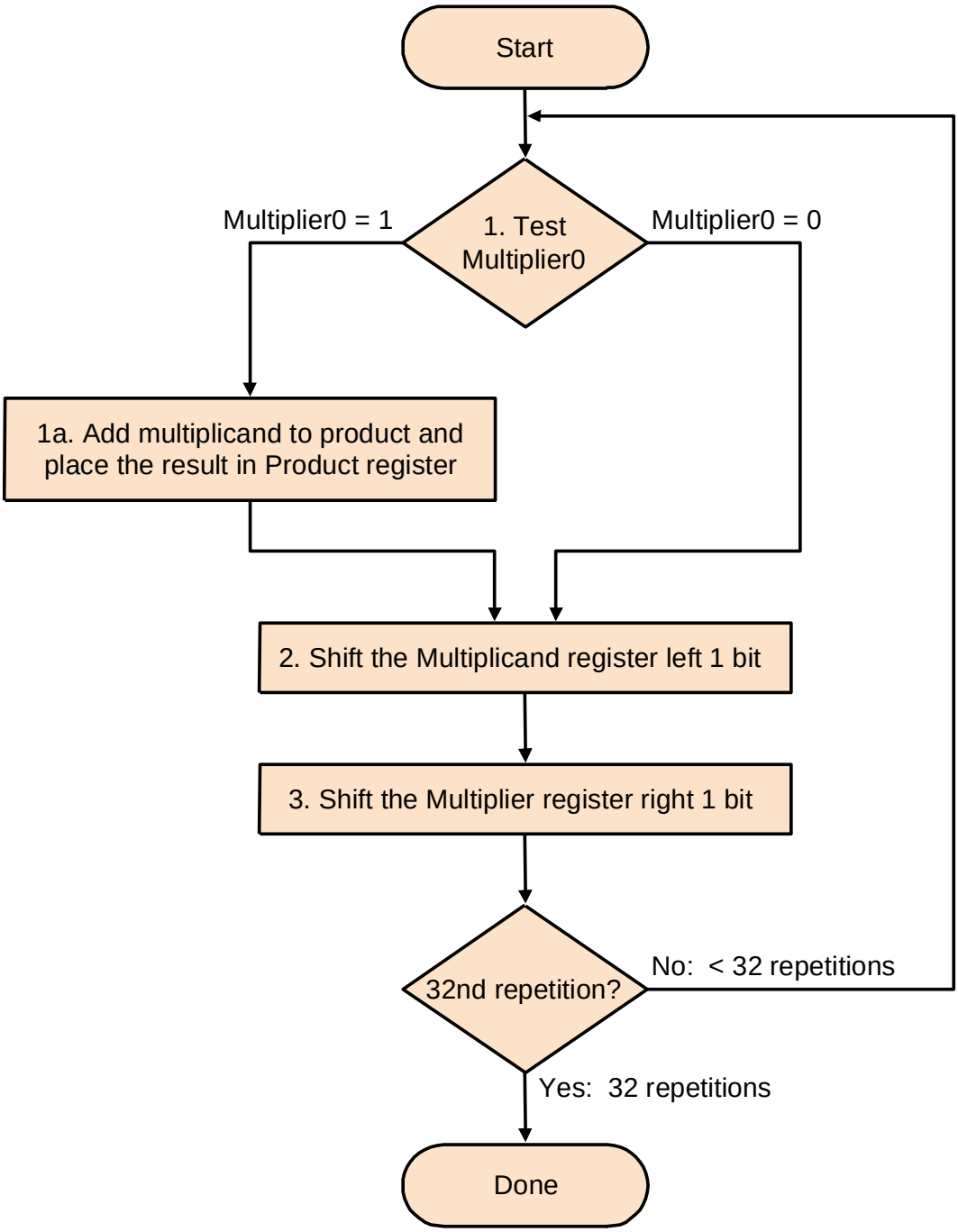
A. Zero-address instruction
B. One-address instruction
C. Two-address instruction
D. Three-address instruction

PART B: STRUCTRED QUESTIONS (40 MARKS)

Question 1 (13 MARKS)

a). Using 4 bits numbers, complete the following table by referring to first version of hardware multiplication flowchart. **Show all your workings.** [6 marks]

(-6) * 5



Iteration	Step	Multiplier (MP)	Multiplicand (MC)	Product (P)
0	**Initial values**	**0101**	**11111010**	**00000000**

b). Using 4 bits numbers, complete the following table by referring to first version of hardware division flowchart. **Show all your workings.** [7 marks]

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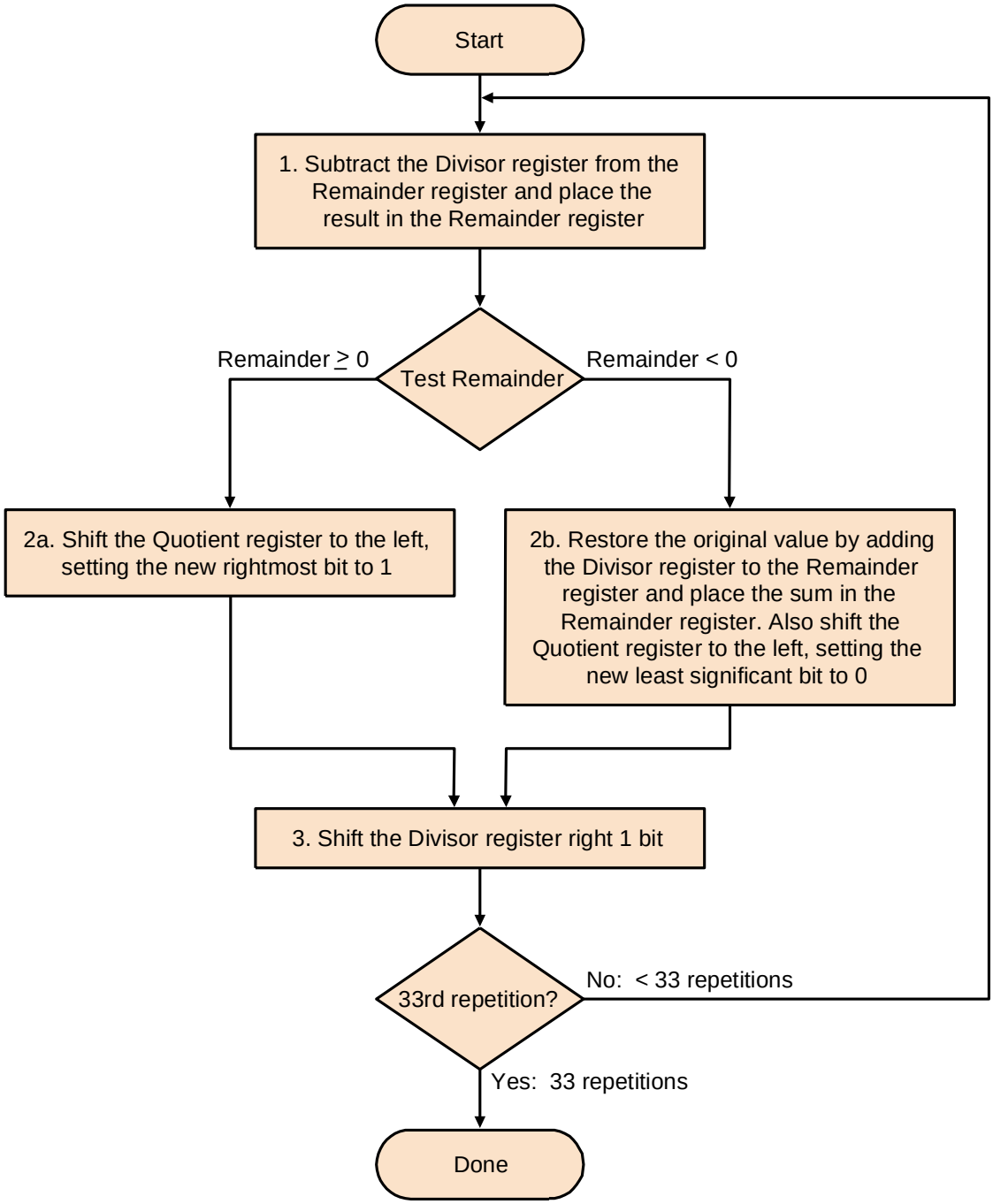

Iteration	Step	Quotient (Q)	Divisor (D)	Reminder (R)
0	**Initial values**	**0000**	**0010 0000**	**0000 0111**

Question 2 (16 MARKS)

a). Construct IEEE 754 single precision format representation for the decimal number **0.40625_{10}**. **Show all your workings.** [6 marks]

b). Convert IEEE 754 single precision floating point number in format given below to equivalent **decimal number**. **Show all your workings.** [5 marks]

1 bit	**8 bits**	**23 bits**
1	**01111011**	**01100000000000000.....000**

c). You have two binary floating point numbers as follows:

C = $1.1011_2 \times 2^{-3}$

D = $-1.0001_2 \times 2^{-4}$

Calculate the results for **C + D**. Use exponent without bias. Assume 5 binary digits for significand and 2 binary digits for exponent. **Show all your workings.** [5 marks]