

POSTAL Book Package

2023

Mechanical Engineering

Objective Practice Sets

Robotics and Mechatronics

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Microprocessor, Microcontroller, PLC

- Q.1** Consider the following statements comparing static RAM with dynamic RAM:
1. In static RAM typical cell requires more number of transistors than dynamic RAM.
 2. Power consumption per bit of static RAM is less than that of dynamic RAM.
- Which statements is/are correct?
- (a) 1 and 2 only (b) 1 only
(c) 2 only (d) None of these
- Q.2** A register of microprocessor which keeps track of the execution of a program and which contains memory address of the next instruction to be executed is called
- (a) Index register
(b) Memory address register
(c) Program counter
(d) Instruction register
- Q.3** In microprocessor the register which holds address of the next instruction to be fetched is
- (a) accumulator (b) program counter
(c) stack pointer (d) instruction register
- Q.4** Which of the following statements are correct?
1. DRAM offers reduced power consumption.
 2. An associative memory is cheaper than RAM.
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) None of these
- Q.5** The program counter (PC) in a microprocessor
- (a) counts the number of program being executed by the microprocessor.
(b) counts the number of instruction being executed by the microprocessor.
(c) count the number of interrupts handled by the microprocessor.
(d) keeps the address of the next instruction to be fetched.
- Q.6** Consider the following register:
1. Accumulator and B register
 2. B and C register
 3. D and E register
 4. H and L register
- Which of these 8-bit registers of 8085 microprocessor can be paired together to make a 16-bit register?
- (a) 1, 3 and 4 (b) 2, 3 and 4
(c) 1 and 2 (d) 1, 2 and 3
- Q.7** A memory system has a total of 8 memory chips each with 12 address lines and 4 data lines. The size of memory system is
- (a) 16 kB (b) 32 kB
(c) 48 kB (d) 64 kB
- Q.8** Which statements is/are correct?
1. A processor can reference a memory stack without specifying an address.
 2. The address is always available and automatically updated in the stack pointer.
- (a) 1 only
(b) 2 only
(c) Both 1 and 2 and 2 explains 1
(d) Both 1 and 2 but 2 does not explain 1
- Q.9** In 8085 microprocessor, the value of the most significant bit of the result following the execution of any arithmetic or Boolean instruction is stored in the
- (a) Carry status flag
(b) Auxiliary carry status flag
(c) Sign status flag
(d) Zero status flag
- Q.10** The address bus of Intel 8085 is 16 bit and hence the memory which can be accessed by this address bus is
- (a) 1 kB (b) 16 kB
(c) 32 kB (d) 64 kB

Answers Microprocessor, Microcontroller, PLC

1. (a) 2. (c) 3. (b) 4. (a) 5. (d) 6. (b) 7. (a) 8. (d) 9. (c)
 10. (d) 11. (a) 12. (a) 13. (d) 14. (c) 15. (a) 16. (d) 17. (c) 18. (a)
 19. (d) 20. (b) 21. (c) 22. (b) 23. (d) 24. (a) 25. (b) 26. (d) 27. (c)
 28. (d) 29. (a) 30. (d) 31. (d) 32. (c) 33. (a) 34. (c) 35. (a) 36. (d)
 37. (d) 38. (c) 39. (b) 40. (b) 41. (b) 42. (a) 43. (c) 44. (a) 45. (c)
 46. (a) 47. (a) 48. (b) 49. (d) 50. (c) 51. (d) 52. (a) 53. (d) 54. (c)
 55. (d) 56. (a) 57. (b) 58. (a) 59. (c) 60. (c)

Explanations Microprocessor, Microcontroller, PLC

1. (a)

Static RAM

- Never refreshed
- Fast
- More expensive
- Require 4 or 6 transistor along with some wiring

Dynamic RAM

- Frequent refresh
- Slow
- Less expensive
- Require a transistor and a capacitor

2. (c)

Program counter is a register that keeps track of the execution of a program and stores the address of the next instruction to be fetched/executed.

3. (b)

Program counter : In microprocessor program counter (PC) hold address of the next instruction which is to be fetched.

4. (a)

DRAM offers reduced power consumption as the information is stored in capacitor fastest.

Associative memory is more expensive than RAM because each all must have an extra storage capability as well as logic circuits formatting its content with external arrangement.

5. (d)

Program counter (PC) : It is a 16 bit register which is user accessible. It keeps the track of address of the next instruction to be fetched from memory for execution

6. (b)

8-bit register paired together to make 16 bit register are

B and C register

D and E register

H and L register

Note: Accumulator (A) and flag register can be clubbed together to form a 16 bit register called program status work (PSW).

7. (a)

Number of memory location in each chip = 2^{12}

Number of bits in each chip = $2^{12} \times 4$ bits

Total number of bits in memory system

$$= 8 \times 4 \times 2^{12} \text{ bits}$$

$$= 4 \times 2^2 \times 2^{10} \text{ bytes}$$

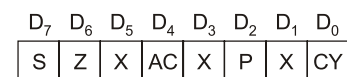
$$= 16\text{k bytes [1 byte = 8 bit]}$$

8. (d)

Stack pointer (SP) always keeps the address of stack-top. Stack pointer keeps updating its value automatically during stack operations.

9. (c)

The flag register have five different flag bit as below:



1. Sign flag (s)
2. Zero flag (z)
3. Auxiliary flag (AC)
4. Parity flag (P)
5. Carry flag (C)