

RRRB - JE

ELECTRONICS

Railway Recruitment Board

Volume - 4

Microprocessor and Microcontroller

PRACTICE SHEET

OBJECTIVE QUESTIONS

1. An 'Assembler' for a microprocessor is used for
 - (a) Assembly of processors in a production line
 - (b) Creation of new programmes using different modules
 - (c) Translation of a program from assembly language to machine language
 - (d) Translation of a higher level language into English text
2. An I/O processor control the flow of information between
 - (a) Cache memory and I/O devices
 - (b) Main memory and I/O devices
 - (c) Two I/O devices
 - (d) Cache and main memories
3. **Assertion (A):** The auto increment and auto decrement modes are seldom found in modern processors.
Reason (R) : Using two instructions instead of one, provides flexibility in implementing a pipeline.
 - (a) Both A and R are true and R is the correct explanation of A
 - (b) Both A and R are true but R is NOT the correct explanation of A
 - (c) A is true but R is false
 - (d) A is false but R is true
4. Compared to a CISC Processor, a RISC processor has
 - (a) Reduced cache memory
 - (b) Reduced number of interrupts
 - (c) Less number of instructions
 - (d) Reduced address lines
5. Assembler directives are required
 - (a) Only in hand assembling
 - (b) Only in machine assembling
 - (c) In hand assembling as well as machine assembling
 - (d) Only when there is an operating system
6. Some system architects do not find RISC instruction repertoire to be cost-effective because it
 - (a) Result in large increase in programme size
 - (b) Result in complex structure of microcode
 - (c) Has been observed that an average compiler does not employ more than a limited subset of an available instruction
 - (d) result in complex decoding of opcode filled resulting in longer execution time
7.is a primitive that can execute code . It contains an instruction pointer (= program counter) and sometimes has its own stack
 - (a) Process
 - (b) Task
 - (c) Kernel
 - (d) Thread
8. The process of imitating one system with another so that the imitating systems accepts the same date, executes same programs and achieves same results as the imitated system is known as
 - (a) Simulation
 - (b) Modification
 - (c) Translation
 - (d) Emulation
9. The computer program which converts statements written in high level language to object code is known as
 - (a) Assembler
 - (b) Operating system
 - (c) Object-oriented software
 - (d) None of the above
10. The digital multiplexer is basically a combi-national

- logic circuit to perform the operation
- (a) AND-AND (b) OR-OR
(c) AND-OR (d) OR-AND
11. A microprocessor is ALU
- (a) And control unit on a single chip
(b) And memory on a single chip
(c) Register unit and I/O device on a single chip
(d) Register unit and control unit on a single chip
12. Machine instructions are written using which of the following ?
- (a) Bits 0 and 1 only
(b) Digits 0 to 9 only
(c) Digits 0 to 9 and the capital alphabets A to Z only
(d) Digits 0 to 9, the capital alphabets A to Z and certain special characters
13. A good assembly language programmer should use general purpose registers rather than memory in maximum possible ways for data processing. This is because:
- (a) Data processing with registers is easier than with memory
(b) Data processing with memory requires more instructions in the program than that with registers
(c) Of limited set of instructions for data processing with memory
(d) Data processing with registers takes fewer cycles than that with memory
14. Which of the following is not correct?
- (a) Bus is a group of wires
(b) Bootstrap is a technique or device for loading first instruction
(c) An instruction is a set of bits that defines a computer operation
(d) An interrupt signal is required at the start of every program
15. Number of address lines necessary to connect 8 k memory chip is
- (a) 10 (b) 11
(c) 12 (d) 13
16. Micro programming is a technique commonly used to implement
- (a) Data path of a processor
(b) Cache memory
(c) Control unit of a processor
(d) None of the above
17. **Assertion (A)** : Many programmers prefer assembly level programming to machine language programming.
- Reason (R)** : It is possible to efficiently utilize the hardware of the computer in machine language programming.
- (a) Both A and R are individually true and R is the correct explanation of A
(b) Both A and R are individually true but R is NOT the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
18. Consider the following statements:
- The process of entering data is called burning in ROM.
 - ROMs are volatile memories.
 - ROMs are used in microcontroller security systems.
- Which of these statements are correct?
- (a) 1, 2 and 3 (b) 1 and 2
(c) 2 and 3 (d) 1 and 3
19. Which one of the following statements is correct?
- (a) RAM is a non-volatile memory whereas ROM is a volatile memory
(b) RAM is a volatile memory whereas ROM is a non-volatile memory

- (c) Both RAM and ROM are volatile memories but ROM data is not lost when power is switched off
- (d) Both RAM and ROM are non-volatile memories but in RAM data is lost when power is switched off
20. An input port is
- (a) Tri-state buffer with register
- (b) Select logic
- (c) Input device
- (d) Read write memory
21. Every processor must necessarily have
- (a) Data bus
- (b) Data bus and address bus
- (c) Control bus
- (d) Address bus, data bus and control bus
22. Cache memory is logically positioned
- (a) Between CPU and main memory
- (b) Between main memory and secondary memory
- (c) Inside the CPU
- (d) Inside the I/O processor
23. A stack is
- (a) An 8-bit register in the microprocessor
- (b) A 16-bit register in the microprocessor
- (c) A set of memory location in R/W memory reserved for storing information temporarily during the execution of a program
- (d) 16-bit memory address stored in the program counter
24. With 2's complement representation, the range of values that can be represented on the data bus of an 8-bit microprocessor is given by
- (a) -128 to +127 (b) -128 to +128
- (c) -127 to +128 (d) -256 to +256
25. Match List-I (Type of Memory) with List-II (Used As) and select the correct answer using the codes given below the lists:
- | List-I | List-II |
|--------------------|-------------------|
| A. DRAM | 1. Cache memory |
| B. SRAM | 2. Main memory |
| C. Parallel Access | 3. BIOS Registers |
| D. ROM | 4. CPU registers |
- Codes: A B C D
- (a) 1 2 3 4
- (b) 2 1 4 3
- (c) 1 2 4 3
- (d) 2 1 3 4
26. The use of cache in a computer system increases the
- (a) Available memory space for the program
- (b) Available memory space for data
- (c) Average speed of memory access
- (d) Addressing range of CPU
27. The data bus in 8080A/8085 microprocessor is a group of
- (a) Eight bidirectional lines that are used to transfer 8 bits between the microprocessor and its I/O and memory
- (b) Eight lines used to transfer data among the registers
- (c) Eight unidirectional lines that are used for I/O devices
- (d) Sixteen bidirectional lines that are used for data transfer between the microprocessor and memory
28. If an original MIB microcomputer operates at 5.MHz with an 8 bit bus and a newer version operates at 20 MHz with a 32 bit bus, compute (approximately) the maximum speed-up possible.
- (a) 2 (b) 4
- (c) 6 (d) 16

29. The larger the RAM of a computer, the faster is its speed, since it eliminates

- (a) Need for ROM
- (b) Need for external memory
- (c) Frequent disk input-outputs
- (d) Need for a data-wide path

30. The mnemonics used in writing a program is called

- (a) Assembly language
- (b) Fetch cycle
- (c) Micro instruction
- (d) Object program

31. Match List-I with List-II and select the correct answer using the codes giveo below the lists:

List-I

- A. Monitor program
- B. Assembler
- C. Mnemonic
- D. Program counter

List-II

- 1. Used to indicate memory location
- 2. A combination of letters, symbols and numerals
- 3. A program that translates symbolic instructions into binary equivalent
- 4. An operating system

Codes: **A** **B** **C** **D**

- (a) 4 3 2 1
- (b) 4 3 1 2
- (c) 3 4 1 2
- (d) 3 4 2 1

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ANSWERS AND EXPLANATIONS

1. *Ans. (c)*
An assembler is used for translations of a program from assembly language to machine language.
2. *Ans. (b)*
An I/O processor control the flow of information between main memory and I/O devices.
3. *Ans. (d)*
4. *Ans. (c)*
5. *Ans. (c)*
6. *Ans. (a)*
7. *Ans. (d)*
8. *Ans. (d)*
9. *Ans. (a)*
The computer program which converts statements written in high level language to object code is known as interpreter or compiler.
10. *Ans. (c)*
11. *Ans. (d)*
A microprocessor contains ALU, control unit and register unit. It is a programmable device.
12. *Ans. (a)*
13. *Ans. (d)*
Data transfer with registers are faster than with memory Normally during opcode fetch data transfer takes place while in memory additional memory read or write cycle is required.
14. *Ans. (d)*
An interrupt signal is not required at the start of every program. Sometimes it requires, sometimes not.
15. *Ans. (d)*
Memory size = 2^n
Where n is the number of address lines.
16. *Ans. (c)*
 $8k = 2^n$
 $\therefore 2^n = 8 \times 2^{10}$
 $\Rightarrow 2^n = 2^{13}$
17. *Ans. (b)*
 $\therefore n = 13$
18. *Ans. (d)*
ROMs are non volatile as these can be reproduced on restoration of power.
19. *Ans. (b)*
20. *Ans. (a)*
21. *Ans. (d)*
22. *Ans. (c)*
24. *Ans. (c)*
25. *Ans. (a)*
26. *Ans. (c)*
27. *Ans. (d)*
28. *Ans. (d)*
The data bus in 8080A/8085 microprocessor is a group of sixteen bidirectional lines that are used for data transfer between the microprocessor and memory.
30. *Ans. (d)*
Bus expansion increases data flow by a factor of $32/8 = 4$. Likewise, operating at a higher clock-speed causes a speed-up of at most $20/5 = 4$. Assuming that operating system and components support it, a speed up of
 $4 \times 4 = 16$.
31. *Ans. (c)*
Since if RAM is not enough, data has to be stored on disk and hence disk I/O is needed which is wasteful of time.
33. *Ans. (a)*
34. *Ans. (a)*