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(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA-305

(Computer Organisation and Architecture)

(New Course)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

A. Tick (✓) the correct answer in the brackets provided :

1×10=10

1. The symbolic notation used to describe the micro-operation transfers among registers is called a
 - (a) microoperation transfer ()
 - (b) register transfer language ()
 - (c) high-level language ()
 - (d) interrupt ()

2. The microoperations that specify binary operations for strings of bits stored in register is called

- (a) shift microoperation ()
- (b) logic microoperation ()
- (c) arithmetic microoperation ()
- (d) register microoperation ()

3. A set of instructions that specifies the operations, operands, and the sequence by which processing has to occur is called

- (a) opcode ()
- (b) computer organisation ()
- (c) arithmetic operation ()
- (d) program ()

4. A set of common instructions that can be used in a program many times is called

- (a) a subroutine ()
- (b) a loop program ()
- (c) a common program ()
- (d) branch instruction ()

(3)

5. The collection of all status bit conditions in the CPU is called

(a) program status word ()

(b) processor status word ()

(c) program stored word ()

(d) processor stored word ()

6. The expression $(A + B) * [C * (D + E) + F]$ in reverse polish notation is

(a) $AB + DE + C * F + *$ ()

(b) $AB + DE + C * F * +$ ()

(c) $AB * DE * + CF *$ ()

(d) $* + F * C + DE + AB$ ()

7. When the DMA takes control of the bus system, it communicates directly with the

(a) processor ()

(b) cache ()

(c) memory ()

(d) I/O processor ()

8. If the registers in interface share a common clock with the CPU register, the transfer between the two units is said to be
- (a) parallel ()
 - (b) serial ()
 - (c) synchronous ()
 - (d) asynchronous ()
9. Memory devices that provide backup storage are called
- (a) main memory ()
 - (b) cache memory ()
 - (c) tape memory ()
 - (d) auxiliary memory ()
10. The transformation of data from main memory to cache memory is referred to as
- (a) memory transformation ()
 - (b) cache ratio ()
 - (c) locality of reference ()
 - (d) memory mapping ()

(5)

II. Indicate *True (T)* or *False (F)* by a Tick (✓) mark :

1×5=5

1. In a memory hierarchy system, programs and data are first stored in cache memory.

(T / F)

2. The program that translate high-level language program to binary code is called assembler.

(T / F)

3. The transfer of new information to be stored into the main memory is called a write operation.

(T / F)

4. In an instruction format the opcode field designates a memory address or a processor register.

(T / F)

5. The input-output processor is similar to CPU except that it is designed to handle the details of I/O processing.

(T / F)

(6)

SECTION—II

(Marks : 10)

III. Answer the following questions : 2×5=10

1. Distinguish between external interrupts and internal interrupts.

(7)

2. What is a virtual memory?

(8)

3. Write the main differences between isolated I/O and memory-mapped I/O.

(9)

4. What are the different tables used by an assembler during its first pass and second pass?

5. Differentiate between logical shift and arithmetic shift microoperation.

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2015

(3rd Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No. : BCA-305

(Computer Organisation and Architecture)

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Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Design a Bus system for five registers using a multiplexer. Also explain the diagram. 5
- (b) Explain the four categories of micro-operations encountered in a digital computer. Give one example each. 5

Or

- (c) Design a 4-bit binary adder-subtractor by explaining how it works. 5

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(Turn Over)

- (d) Consider the 8-bit register content 10101010. What will be the content of the register after performing the following shift operations? 5
- (i) 2 logical shift left
 - (ii) 3 logical shift right
 - (iii) 1 circular shift right
 - (iv) 3 arithmetic shift left
 - (v) 1 logical shift left followed by 1 circular shift right

2. (a) Explain the three basic computer instruction formats by giving suitable example. 4

- (b) Write and explain the flowchart for the second pass of an assembler. 6

Or

- (c) What is machine and assembly language? Mention its relative advantages and disadvantages. 5

- (d) Write the four phases of an instruction cycle. Draw the diagram for the control unit of the basic computer. 5

3. (a) What is a CPU? Explain one method by giving a suitable diagram how stack can be implemented in a digital computer. 5

- (b) Explain any five addressing modes of an instruction by giving a suitable example. 5

(3)

Or

- (c) Explain zero, one, two and three address instructions by giving a suitable example. 5
- (d) Differentiate between RISC and CISC. 5
4. (a) Explain the four types of commands that an interface of peripheral devices received. 4
- (b) What is DMA? Write the block diagram of a DMA controller. 6

Or

- (c) Explain strobe pulse method and handshaking methods of Asynchronous Data Transfer by giving a suitable diagram. 8
- (d) What are the three modes on data transfer to and from peripheral devices? 2
5. (a) Write the block diagram and function table of 128×8 RAM chip by explaining how it works. 5
- (b) Write and explain different types of memory in a digital computer system. 5

(4)

Or

- (c) Write a short note on magnetic disk. 4
- (d) What are different mapping methods of a cache memory? Explain the address mapping method using paging technique. 6
