Student's Question Bank

1'st stage – Information Technology Dep.

Computer Organization & Applied Logic

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UHD @ 2015

Chapter 1- Computer Organization Fundamentals

1. What are the main arithmetic operations for central processing unit "CPU" in computer? Just mention them.
2. Define: **Diligence, Versatility**
3. There is one limitation of the computer function comparing with human beings. Explain what is it?
4. Define the computer and what are the main operations and functions that accomplished by computer?
5. What are the major characteristics of computer? And explain two of them.
6. What are the four main components of any general purpose computer?
7. Fill in the blanks:

   a) Simpler calculations take ……..time, but complex calculations take ……. time in processing.
8. Mark the following sentences with (**True**) or (**False**) and correct the false?

   a) Simpler calculations take longer time, but complex calculations take less time in processing.

Chapter 2- Computer Generations

1. Compare between First Generation Computers and Second Generation Computers.
2. What are the major limitations of first generation computers?
3. Explain Third Generation Computers in terms of components manufacturing technique, size, types, speed, programming languages.

4. There are four types of computers, what are they? And explain one of them?
5. Fill in the blanks:
   a) In Second Generation Computers a device called …….. replaced the bulky electric tubes in the first generation computer.
   b) The programming languages such as …….and …….. were developed during second generation computers.
6. Mark the following sentences with (**True**) or (**False**) and <u>correct</u> the false?
   a) In the second generation that the concept of Central Processing Unit (CPU), memory, programming language and input and output units were developed.
   b) In Second Generation Computers a device called integrated circuit replaced the bulky electric tubes in the first generation computer.
   c) Transistors are smaller than electric tubes and have higher operating speed.

Chapter 3- Basic Design of a Computer

1. Fill in the blanks:
   a) Input, is the process of entering …… and …… in to the computer system.

c) The process of saving ……. and …… permanently is known as storage.
d) The task of performing operations like arithmetic and logical operations is called …….
e) The Central Processing Unit (CPU) takes data and instructions from the storage unit and makes all sorts of calculations based on the …….. given and the type of ……. provided.
f) Output is the process of producing ……. from the data for getting useful information.
g) There are two kinds of computer memory …… and ……..
h) The cost of primary memory is …….. than secondary memory, and the size of primary memory is ……than secondary memory.
i) The computer takes information or data in ……. form from you, convert it in to …….. form, process it producing output in …… form and again convert the output to ……. form.
j) The Primary or internal storage section is made up of several small storage locations called ……..
k) Each cell of primary storage has a unique number assigned to it called …….

2. Explain the function of Processing and Storage in any computer system?
3. What are the major functions that the storage unit performs?
4. What are the functional units inside central processing unit CPU? And explain one of them?
5. Von Neumann architecture is
   (A) SISD (B) SIMD (C) MIMD (D) MISD
6. Answer the following:
   a. What is the difference between ***Primary*** and ***Secondary*** memory?

b. What is the difference between ***ROM*** and ***RAM*****?**

7. Mark the following sentences with (**True**) or (**False**) and correct the false?

   a. The cost of primary memory is more expensive than secondary memory, and the size of primary memory is larger than secondary memory.

8. If the speed of 8085 microprocessor is (5MHz), calculate how many instructions this processor can execute per (1 sec).
9. If the speed of 8080 microprocessor is (2MHz), calculate the time for execute (1 instruction).
10. Draw the diagram of basic organization of any computer system.
11. Why the processor takes the data from RAM directly, and not from hard disk directly?
12. What are the basic physical components that make the computer work?

Chapter 4- Computer Memory and Memory types

1. Draw the basic processor to memory device interface with system lines.
2. Define:
   a) Bus contention.

b) Chip select.
c) Tristate output.

3. Fill in the blanks:

a. A method had to be developed to allow processor to communicate to multiple memory device across the same set of wires. If this wasn't done, the processor would need a separate set of ……., ……, and …….. for each device.
b. If two memory devices tried to drive the data lines simultaneously, the result would be …… in a condition called ……..
c. When multiple memory devices are trying to output to the same lines at the same time, the …… Lines disconnected and ……., ……. Lines remain connected.
d. When the processor wants to communicate with the memory device, it pulls that device's chip select ……
e. The disconnection of the data lines is performed using **……..** for the data lines of the memory chips.
f. The third state is controlled by the chip select. When the chip select equals ……., data lines are set to high impedance, and when the chip select equals ……., causes the data lines to be active.
g. The storage of data and instructions inside ROM is ……., and in RAM is …….
h. Erasable optical disks are based on a technology known as ……..
i. The width of data bus determines ..... and the width of address bus determines.....
j. There are two main memory modules ..... and.....

k. The speed of CPU is …… compared to the access time of main memory. Therefore the performance of CPU ……. due to the slow speed of main memory.
l. Cache memory is used to store programs or data ……. being executed or ……. data frequently used by the CPU.
m. In the secondary storage the cost per bit of storage is …….. However, the operating speed is ……. than that of the primary storage.
n. System bus used for ……. And ……. between the processor, memory and peripherals.

4. Mark the following sentences with (**True**) or (**False**) and <u>correct</u> the false?
   A. The processor can communicate with one memory device at a time even though it is physically connected to many devices.
   B. The processor can communicate with more than one memory device at a time.
   C. When multiple memory devices are trying to output to the same lines at the same time, the address lines disconnected. and data, control lines remain connected.
   D. When the processor wants to communicate with the memory device, it pulls that device's chip select high.
   E. The storage of data and instructions inside the primary storage is temporary, and in secondary storage is permanently.
   F. Each memory cell in DRAM has only transistors, but each memory cell in SRAM has transistors and capacitors.

5. Give full word for these abbreviations:
   I. **FPM DRAM.**
   II. **DDR SDRAM.**
   III. **EPROM.**

6. Why it is necessary to use cache memory between CPU and primary memory?
7. Chose a correct answer:

   A given memory chip has 12 address pins and 4 data pins. It has the following number of locations.
   a. 24 b. 212 c. 248

RAM is called DRAM(Dynamic RAM) when
   a. a.it is always moving around data
   b. b.it requires periodic refreshing
   c. it can do several things simultaneously
   d. none of the above

Which of the following is Non-Volatile memory?
   a. EEPROM
   b. SRAM
   c. DRAM
   d. None of the above

8. What are the Advantages of Magnetic Tape "just mention"?
9. List down The benefits of secondary storage. And explain **one**?
10. What is the difference between DRAM and SRAM, in terms of characteristics such as speed, size and cost?
11. How does SDRAM differ from ordinary DRAM?
12. Draw the diagram how two memory devices sharing a system bus.
13. Draw the diagram to show the tristate buffers.
14. By using table, make a comparison between "registers, cache memory, RAM, hard disk" regarding (speed, capacity, cost, storage type)
15. What are the three <u>main</u> types of secondary storage?

16. What would happen if there is no cache memory between CPU and primary memory?
17. There are a great many variations in architecture between the different kinds of CPU. What are these variations in architecture, like what?? Explain.
18. Explain the mechanism of working in magnetic disk.
19. Draw the simplified model of the central processing unit.
20. Draw the figure that obtained Three memory devices connected to the CPU with all buses connections.
21. Where is the location of Cache memory in computer system?

Chapter 5- System Bus

1. Define and give functions for:
    a. Arithmetic & Logic Unit (ALU).
    b. Control Unit (CU).
    c. System bus.
2. Mention five tasks for Arithmetic & Logic Unit (ALU)? And explain two of them?
3. What is the system bus? And what are its types? Explain one of them?
4. What is the function of:
    a. Control bus.
    b. Data bus.
    c. Address bus.

5. What is Pipeline?
6. Chose a correct answer:

   Any computer must at least consist of
   a. Data bus b. Address Bus
   c. Control Bus d. all of the above

   A collection of lines that connects several devices is called .....
   a. bus b. peripheral connection wires
   c. Both a and b d. internal wires

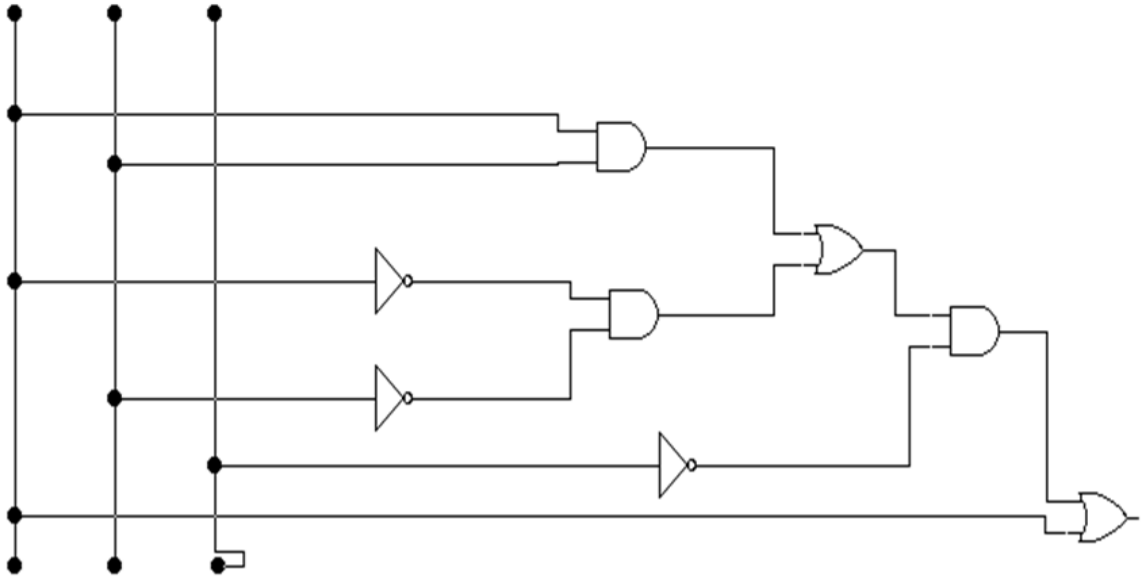
7. What is the processor cycle?
8. List the pipeline stages?
9. Draw a diagram that shown the pipeline stages for Three Instructions.
10. What are the difference between **Von Neumann** and **Harvard** architecture?
11. What is interrupt?
12. What are the problems of using single bus?
13. How we can find a solution of the problem that caused by using single bus?

Chapter 6- Digital & Analog (Applied Logic)

1. What are the difference between Digital and Analog?
2. Draw the block diagram of digital computer.
3. What is the fraction of (Binary, Decimal, Octal and Hexadecimal)?
4. What is a gray code?
5. What is BCD?

6. Why we using a code in digital?
7. If X= (5A4)16 and Y= (77)8, find X-Y using 2's complements?
8. Write the Boolean expressions and construct the truth tables describing the outputs of the circuits described by the following logic diagrams?

A B C

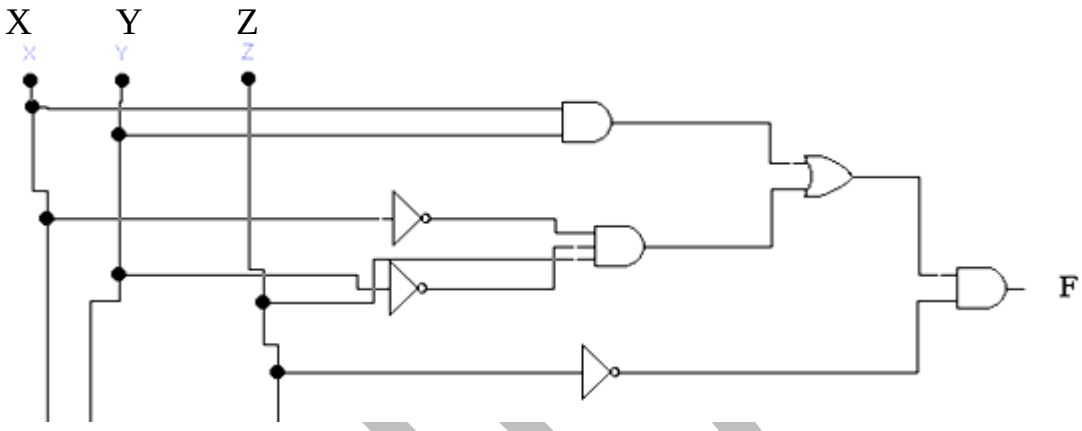


9. Prove the following:
   a. (A+B).(B+C).(A+C) = (A+B).(A+C)

   b. A B + B C D + A B C + C D = B + C D

10. If X= (155)16 and Y= (122)8, find X-Y using 1's complements?

11. Write the Boolean expressions and construct the truth tables describing the outputs of the circuits described by the following logic diagrams?



12. If X= (200)8 and Y= (400)16 find:
    b. Y-X by using 10's complement
    c. X-Y by using 2's complement

13. Answer the following:
    1. (100001)2 – (111)2 = ( ) 2
    2. (10101110101) Gray code = ( ) 2
    3. (231.3645)10 = ( ) 2
    4. (1091)16 = ( ) BCD

14. Simplify and design the following Boolean function by using RON gates. (Write the truth table).

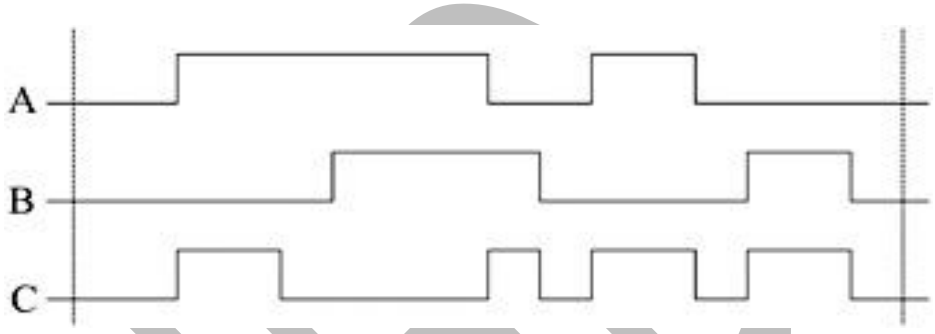
$$F = \overline{X}\overline{Y}\overline{Z} + \overline{X}\overline{Y}Z + \overline{X}Y\overline{Z} + \overline{X}YZ + XY\overline{Z}$$

15. Answer the following:
    a. (671.66)8 □ ( )2
    b. (100001)2 – (111)2 = ( )10

c. (10101110101) Gray code □ ( )2

d. (20C)16 □ ( )BCD \

16. Why we need Complements? What are the types of Complements?
17. Let A= $(\mathbf{10011})_{\mathbf{2}}$ and B= $(\mathbf{10101})_{\mathbf{2}}$ find (A+B), then according to the result you get change b0 and b1 to "1", then convert the result to Gray Code.
18. According to the timing diagram find (A+B+C), (A.B.C) and ($\overline{\mathbf{A}}$).



19. If X= $(\mathbf{10001})_{\mathbf{2}}$ and Y= $(\mathbf{10101})_{\mathbf{2}}$ then find X multiply by Y, then according to the result of multiplication change the least significant bit to "1" then convert the final result to Gray code.
20. If A= $(\mathbf{10011})_{\mathbf{Gray\ code}}$ and B= $(\mathbf{11000})_{\mathbf{Gray\ code}}$, convert them to binary and fid (A+B).
21. Chose the right answer:

The output of an AND gate with three inputs, A, B, and C, is HIGH when _____.

A. A = 1, B = 1, C = 0

B. A = 0, B = 0, C = 0

C. A = 1, B = 1, C = 1

D. A = 1, B = 0, C = 1

If a 3-input NOR gate has eight input possibilities, how many of those possibilities will result in a HIGH output?

A. 1 **B.** 2

C. 7 **D.** 8

If a signal passing through a gate is inhibited by sending a LOW into one of the inputs, and the output is HIGH, the gate is a(n):

A. AND **B.** NAND

C. NOR **D.** OR

22.Chose the right answer of the following:

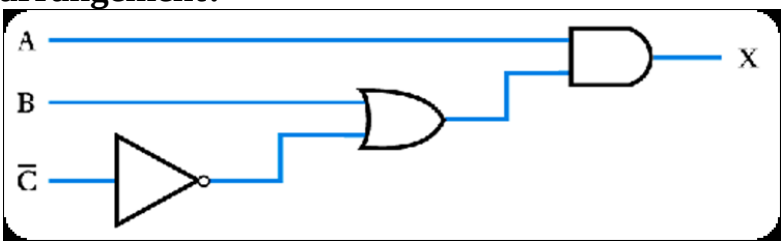
1. **Which logic gate has the following truth table?**

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

A. An exclusive OR gate
B. An exclusive NOR gate
C. A two-input AND gate
D. A two-input OR gate.

2. **In Boolean algebra the AND function is represented by the '+' sign.**
   A. True
   B. False
   C. Not given.

3. **What Boolean expression describes the output X of this arrangement?**



Ch1: 8 Qs

Ch2: 6 Qs

Ch3: 12 Qs

Ch4: 21 Qs

Ch5: 13 Qs

Ch6: 22 Qs

Total questions: 82

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