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**DEPT: BS(CS)**

**ASSGINMENT: #02 (ICT)**

**Briefly answer the following questions.**

1. Differentiate between the characteristic of primary and secondary storage of a computer?

**Primary memory is volatile, while secondary memory is non-volatile**. Primary memory is stored on semiconductor chips, while secondary memory is stored on external hardware devices. Primary memory is classified into cache and random access memory, while secondary memory has no such categories. Primary memory is faster.

1. Why are mainframe systems usually limited in the number of tasks they perform?

Mainframe systems are limited in the number **due to its highly specialized working and of a high cost and Preserve as much power as possible for required operations**

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1. What new types of computer application emerged during third, fourth, and fifth computer generations and what were the main driving technologies behind each?

Third-generation computer applications included time-sharing and multitasking operating systems, which allowed multiple users to access a mainframe computer simultaneously. Fourth-generation computer applications were characterized by the development of microprocessors and personal, computers, which enabled users to have computing power on their desktops. Fifth-generation computer applications include artificial intelligence and natural language processing, which are made possible by advances in computer hardware and software, as well as machine learning algorithms.

1. What are advantages of transistor over vacuum tubes?

Transistors are smaller, faster, more reliable, and consume less power than vacuum tubes. They also generate less heat and do not require as much maintenance as vacuum tubes. These advantages made transistors a revolutionary technology that enabled the development of smaller, faster and more powerful electronic devices, including computers.

1. Perform the following expressions. (FACE)16 = (?)2

To convert from base 16 to base 2 (binary), we can convert each hexadecimal digit to its 4-bit binary equivalent:

F = 15 = 1111, A = 10 = 1010, C = 12 = 1100, E = 14 = 1110,

(FACE)16 = (1111101011001110)2

1. Perform the following expressions. (BEAF)16 = (?)2

To convert from base 16 to base 2 (binary), we can convert each hexadecimal digit to its 4-bit binary equivalent:

B = 11= 1011, E = 14 = 1110, A = 10 = 1010, F = 15 = 1111

(BEAF)16 = (10111110101111)2

1. Convert the following octal numbers into decimal a= (1054352)8 b= (1205)8

To convert (1054352)8 to decimal, we need to expand it in terms of powers of 8 and then evaluate.

1. (1054352)8 = 1 x 8^6 + 0 x 8^5 + 5 x 8^4 + 4 x 8^3 + 3 x 8^2 + 5 x 8^1 + 2 x 8^0 = 262144 + 16384 + 2048 + 256 + 40 + 5 + 2 = 279879

(1054352)8 = (279879)10

1. (1205)8 to decimal, we follow the same process:

(1205)8 = 1 x 8^3 + 2 x 8^2 + 0 x 8^1 + 5 x 8^0 = 512 + 128 + 0 + 5 = 645

(1205)8 = (645)10

1. Convert the following binary number into octal and then into hexadecimal number a= (11100001101)2 b= (1100001101)2 c= (000110111101)2

a) To convert (11100001101)2 to octal, we group the binary digits into groups of 3, starting from the right, and pad with zeros on the left if necessary. (11100001101)2 = 011 100 001 101

011 = 3 100 = 4 001 = 1 101 = 5

Therefore, (11100001101)2 = (3415)8 in octal.

To convert (3415)8 to hexadecimal, we can first convert it to decimal and then convert the decimal number to hexadecimal.

(3415)8 = 3 x 8^3 + 4 x 8^2 + 1 x 8^1 + 5 x 8^0 = 1533

Then, (1533)10 = (5FD)16 in hexadecimal.

Therefore, (11100001101)2 = (5FD)16 in hexadecimal.

b) To convert (1100001101)2 to octal, we group the binary digits into groups of 3, starting from the right, and pad with zeros on the left if necessary.

(1100001101)2 = 011 000 011 01

Next, we convert each group of 3 binary digits to its corresponding octal digit.

011 = 3, 000 = 0, 011 = 3, 01 = 1

Therefore, (1100001101)2 = (3031)8 in octal.

To convert (3031)8 to hexadecimal, we can first convert it to decimal and then convert the decimal number to hexadecimal.

(3031)8 = 3 x 8^3 + 0 x 8^2 + 3 x 8^1 + 1 x 8^0 = 1233

Then, (1233)10 = 4D116 in hexadecimal.

Therefore, (1100001101)2 = (4D1)16 in hexadecimal.

c) To convert (000110111101)2 to octal, we group the binary digits into groups of 3, starting from the right, and pad with zeros on the left if necessary.

(000110111101)2 = 000 110 111 101

Next, we convert each group of 3 binary digits to its corresponding octal digit.

000 = 0 110 = 6 111 = 7 101 = 5

Therefore, (000110111101)2 = (675)8 in octal.

To convert (675)8 to hexadecimal, we can first convert it to decimal and then convert the decimal number to hexadecimal.

(675)8 = 6 x 8^2 + 7 x 8^1 + 5 x 8^0 = 421

Then, (421)10 = 1A516 in hexadecimal.

Therefore, (000110111101)2 = (1A5)16 in hexadecimal.

THE END