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Rewarding Career

HINTS AND SOLUTIONS

CTNC - III

1. (d) 26 Capital letters + 26 small letters + 10 digits + 32 other characters.

2. (d) Now 3 address instruction means the operation code followed by 3 address registers. 64 operation codes = 2^6 so 6 bits for op. code Now 2 MB = 2^{21} bytes. So no. of bits in MAR should be 21. So max. bits required for a 3 address be 21. So max. bits required for 3 Address instruction are $6 + 21 + 21 + 21 = 69$.

3. (c) It uses laser technology.

4. (d) Output in NAND gate is 1 when at least one input is 0. so, no. of combinations having at least 1 zero = total combinations - 1 combination having all 1's. So, $2^{10} - 1 = 1023$ because total combinations with 10 inputs is 2^{10}

5. (b) Capacity = $s * p * t * m$
 $= 256 * 128 * 1000 * 10 = 327.68 \text{ MB.}$

10 Surfaces because 5 plates has 10 surfaces.

6. (c) A1. UV is in 32 base system. Now $32 = 2^5$ so we replace each digit by a 5 bit code to get. The binary equivalent of this no. So A1.UV = 0101000001.1111011111. Now to get the Octal no. take the combinations of 3 bits and then replace each combination by the corresponding octal digit 0101000 001.111 101 111 1 = 101000001.111101111100 = (501.7574) in base 8.

7. (d) $2 \text{ MB} = 2 * 1000 \text{ K} = 2 * 2^{10} * 2^{10} \text{ bytes.}$
 $= 2^{21} \text{ bytes. So, 21 bits for MAR.}$

Each word of 1 byte and 1 byte = 8 bits.

So, 8 bits for MDR.

8. (b) Minimum no. is = 0.100000000000E1111
 $= (2^{-1}) * 2^{-(2-1)} = 2^{-1} * 2^{-7} = 2^{-8}$

9. (a) Average access time = avg. latency time + avg. seek time. Avg. seek time = 10ms. Avg. latency time = Half the time taken by disk rotation. Time for 1 rotation = $1/10000 \text{ min.} = 60/10000 \text{ s} = 6 \text{ ms.}$ So. Avg. latency time = $6/2 \text{ ms} = 3 \text{ ms.}$ So avg. access time = $(10+3) \text{ ms} = 13 \text{ ms.}$

10. (c) On adding the 2 exponent we get 11010110 in the exponent part which indicates over flow for 2 positive exponent.

11. (a) For unsigned integer $1110 = 14$ in decimal in signed 2's complement representation. Now the sign bit is 1 so the no. is negative and we again have to take the 2's complement 2's compl. of 1110 is 0010. So the no. is -2.

12. (c)

13. (c) 16 million = 2^{24} . Now any pixel can have 1 out of 2^{24} colors. So, 24 bits will be there for each pixel in the memory. 24 bits = 3 bytes.

Now total pixels = $1024 * 1280$. So total buffer memory required = $1024 * 1280 * 3 \text{ bytes} = 4 \text{ MB.}$

14. (c) Cache memory is a buffer between main memory and the processor.

15. (c)

16. (d)

17. (b) Perl is a procedural scripting language.

18. (d) All the statement are true.

19. (b) It is a tab operator. So prints 1 to 5 in the same line but with fixed gap between them.

20. (d)

21. (b) Multiple initialisation and incrementation expressions are allowed in FOR loop. However only 1 expression is allowed in test expression.

22. (c) We can only have an int. constant or a char constant after case. So float constant will give a Syntax error.

23. (c) Range for integer constants is -32768 to 32767.

Now here $i = 35,000$ So, $35,000 - 32767 = 2233$.

Now $32767 + 1 = -32768$

So, $32767 + 2233 = -32768 + 2232 = -30536$.

24. (b) Now 24 address lines means the maximum capacity is 2^{24} .

1 memory chip has capacity $64 \text{ kb} = 2^{16} \text{ bytes.}$

So no. of chips = $2^{24} / 2^{16} = 256$

25. (c) $a = 12.5$, $b = 2.75$. Using normalized floating Point representation with 4 bits for mantissa and exponent

$a = 1100.1 = 0.110E0100$

$b = 0010.11 = 0.101E0010$

Now making the exponent of smaller no. same as that of larger. So $b = 0.001E0100$ now on adding the two terms

mantissa becomes $0.110 + 0.001 = 0.111$ and exponent is 0100. So the no. is $0.111E0100$ which is 1110 in binary and 14 in decimal.

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