

ISRO 26th April 2009 Computer Science Placement Paper

1. A full binary tree with n leaves contains $(2N-1)$
2. The expression $1*2^3*4^5*6$ will be evaluated as?
3. The feature in object oriented programming that follows the same operation to be carried out differently, depending on the object, is?
4. The microinstructions stored in the control memory of a processor have a width of 26 bits. Each microinstruction is divided into three fields: a microoperation field of 13 bits, a next address field(x), and a MUX select field(y). There are 8 status bits in the inputs of the MUX. How many bits are there in the X and Y fields, and what is the size of the control memory in number of words?
5. A cpu has 24-bit instructions. A program starts at address 300(in decimal). Which one of the following is a legal program counter (all values in decimal)?
6. Consider a disk pack with 16 surfaces, 128 tracks per surface and 256 sectors per track. 512 bytes of data are stored in a bit serial manner in a sector. The capacity of the disk and the number of bits required to specify a particular in the disk are respectively.
7. Consider a pipelined processor with the following four stages
IF:Instruction Fetch
ID:Instruction Decode and Operand Fetch **EX:**Execute **WB:**Write Back
The IF, ID and WB stages take one clock cycle each to complete the operation. The ADD and SUB instructions need 1 clock cycle and the MUL instruction need 3 clock cycles in the EX stage. Operand forwarding is used in the pipelined processor. What is the number of clock cycles taken to complete the following sequence of instructions?

ADD R2,R1,R0 R2 R1+R0
MUL R4,R3,R2 R4 R3+R2
SUB R6,R5,R4 R6 R5+R4
8. The use of multiple register windows with overlap causes a reduction in the number of memory accesses for:-
 1. Function locals and parameters
 2. Register saves and restores
 3. Instruction fetches
9. A processor that has carry, overflow and sign flag bits as part of its program status word(PSW) performs addition of the following two 2's complement numbers 0100101 and 11101001. After the execution of this addition operation, the status of the carry, overflow and sign flags, respectively will be
10. The two numbers given below are multiplied using the Booth's algorithm.
Multiplicand: 0101 1010 1110 1110 Multiplier: 0111 0111 1011 1101 How many additions/Subtractions are required for the multiplication of the above two numbers?
11. The addition of 4-bit, two's complement, binary numbers 1101 and 0100 results in

12. Which of the following statements about relative addressing mode is FALSE?
- 1.It enables reduced instruction size
 - 2.It allows indexing of array element with same instruction
 - 3.It enables easy relocation of data
 - 4.It enables faster address calculation than absolute addressing
13. Substitution of values for names(whose values are constants) is done?
14. A root alpha (symbol) of equation $f(x) = 0$ can be computed to any degree of accuracy if a 'good' initial approximation x_0 is chosen for which?
15. Which of the following statement is correct? Ans. $\Delta(U_k - V_k) = U_{k+1} - \Delta V_k + V_{k+1} - \Delta U_k$

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- 1.The minimum number of edges in a connected cyclic graph on n vertices is
a) n-1 b) n c) n+1 d)none of these
- 2.A full binary tree with n non leaf nodes contains
a) n nodes b) $\log n$ nodes c) $2n-1$ nodes d) $2n$ nodes
- 3.The time complexity of shell sort
a) $O(n)$ b) $O(\log n)$ c) $O(n^2)$ d) $O(n^3)$
- 4.The time taken to insert an element after an element pointed by some pointer
a) $O(1)$ b) $O(\log n)$ c) $O(n)$ d) $O(n \log n)$
5. what is the name given to the first generation computer?
a) Binary language b) Machine language c) Assembly language
- 6.The root directory of a disk should be placed
a) at a fixed address in main memory
b) at a fixed location on disk
c) anywhere on disk.
- 7.A top down parser generates

- a) right most derivation
- b) left most derivation
- c) right most derivation in reverse
- d) left most derivation in reverse

8.what is the name of the OS that reads and reacts in terms of actual time?

- a)batch system
- b)time sharing
- c)real time

9.FDDI is a

- a)ring network
- b)star network
- c)mesh network

10.Computer memory consists of

- a)ROM
- b)PROM
- c)RAM
- d)all the above