ENTRANCE EXAMINATION FOR ADMISSION, MAY 2006.

M.Tech. (Computer Science)

COURSE CODE : 376

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 376

Time : 2 Hours

Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you – 1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

NOTE: For all the questions 1-100, there are two more choices that are common. They are

(D) All of the above

(E) None of the above

1. Graphs can be represented with

(A) Adjacency matrices (B) Adjacency lists

(C) Adjacency multilists

2. Which of the following corresponds to tree traversal techniques?

(A) Preorder (B) Inorder (C) Level order

3. Time complexity of tree traversal technique is

(A) O(n) (B) O(log n) (C) O(n log n)

4. Which of the following fall in the category of balanced trees?

(A) AVL trees (B) B-trees (C) Red-Black trees

5. Polynomial additions can be efficiently done with

(A) Stacks (B) Queues (C) Linked lists

6. Test for view serializability is done with the help of

(A) Precedence graph constructed from a schedule

(B) Labeled Precedence graph constructed from a schedule

(C) Undirected graph of the schedule

7. Thomas' write rule is related with

(A) Graph based protocols (B) Validation based protocols

(C) Time stamp based protocols

8. An alternative to log based crash recovery is

(A) Log record buffering (B) Shadow paging

(C) Database buffering

9. Which of the following is the fundamental operation in relational algebra?

(A) Intersection (B) Natural join (C) Division

10. Select, Project and Rename operations in relational algebra are

(A) Binary operations (B) Unary operations

(C) Ternary operations

11. Which of the algorithm is related with AI?

(A) A* (B) Constraint satisfaction

(C) British museum

12. Which of the following is the Knowledge representation technique?

(A) Semantic nets (B) Predicate logic

(C) Propositional logic

13. Which of the following is a search method in AI ?

(A) Local beam method (B) Hill climbing

(C) Greedy best-first

14. Inference engine is a component of

(A) RDBMS (B) AI system (C) OODBMS

15. Uncertainity is handled in

(A) Predicate logic (B) Propositional logic

(C) Bayesian method

16. Octree is used for

(A) 2D representation (B) 3D representation

(C) antialiasing

17. Oblique projection is

(A) Perspective projection (B) Parallel projection

(C) Surface rendering method

18. Cohen-Sutherland algorithm is for

(A) Line clipping (B) 3D- Viewing

(C) Polygon clipping

19. In graphics illumination model, the lighting that comes from all direction is

(A) Diffuse lighting (B) Ambient illumination

(C) Specular lighting

20. Computer Graphics is concerned with

(A) Modeling (B) Rendering

(C) Animation

21. Which are all the factors to be considered while designing a cache?

(A) Mapping function

(B) Replacement algorithm and cache size

(C) Write Policy

22. Raid level 3 uses

(A) Mirroring (B) Bit interleaved parity

(C) Block level parity

23. Simplify the Boolean function

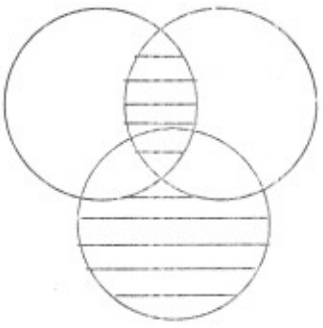
F(a,b,c,d) = (0,1,2,5,8,9,10) and give the product of sums

(A) (c' + d')(a' +b')(b' + d)

(B) (c+d)(a+b)(b+d')

(C) cd+ab+bd'

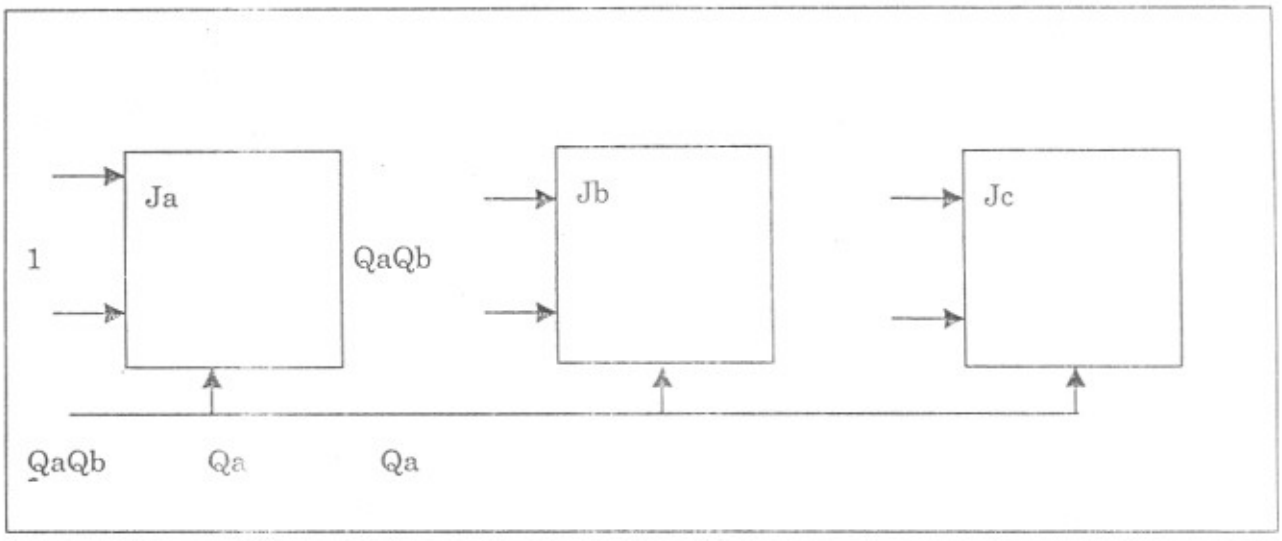
24. The Boolean expression for the shaded area in the accompanying Venn diagram is



(A) F(x,y,z) = xyz' + x'y' (B) F(x,y,z) = (x+y)(x'+y'+z)

(C) F(x,y,z) =x'y'z +xy

25. A Synchronous counter id depicted as follows. If it is currently in state Qa Qb Qc = 101, what will be its next state?



(A) 110 (B) 011 (C) 101

26. A floating point number is said to be normalized if

(A) least significant bit of mantissa is zero

(B) most significant bit of mantissa is zero

(C) most significant bit of exponent is zero

27. The code which changes by only one bit as it sequences from one number to the next is

(A) gray code (B) BCD (C) Excess-3

28. A three state gate is a digital circuit which exhibits 3 states and the third state is a

(A) high impedance state (B) low resistance state

(C) high capacitance state

29. With respect to the above question the third state behaves like a

(A) closed circuit (B) open circuit

(C) random circuit

30. If the control information is in the control memory, we call this type of control organization as

(A) Hard-coded control (B) Hard-wired control

(C) Micro-programmed control

31. Which of these is called Content addressable memory

(A) auxiliary memory (B) extended memory

(C) associative memory

32. In Intel 8085 which of these is used to reset other devices

(A) reset out (B) reset in (C) reset

33. which of the following can be called as a feature of RISC Microprocessor

(A) RISC Microprocessors ececutes most instructions in a single cycle

(B) RISC Microprocessors have several general purpose registers and large cache memories

(C) RISC Microprocessors processes several instructions simultaneously and thus includes pipelining

34. Which of the following is true about breakpoint instruction in a Microprocessor

(A) is a debugging tool that allows programmer to check the entire section of program

(B) allows programmer to pass over an entire section of program

(C) MC68020 includes this instruction

35. The first OS used in Microprocessors is

(A) Zenix (B) DOS (C) CP/M

36. Example of an operating system supporting kernel level threads

(A) Windows 2000 (B) Solaris

(C) Linux

37. In a single processor system, mutual exclusion can be enforced by

(A) Overlapping processes (B) Interleaving processes

(C) Disabling Interrupts

38. If a page size is 1K what is the minimum number of bits needed to access every individual location within the page.

(A) 8 bits (B) 10 bits (C) 12 bits

39. Suppose the relative address is given as 1820 to a 16 bit paged memory manager that uses 1K page size, what would be the page number and offset ?

(A) Page 0 and offset 600 (B) Page 1 and offset 696

(C) Page 2 and offset 257

40. Assume that a file is stored in 5 adjacent tracks with 320 sectors per track. The average seek time is 10 ms, rotational delay is 3 ms and the time required to read a track is 7ms.. What is the time required to read the entire file?

(A) 40 (B) 60 (C) 80

41. Which of the following is (are) True ?

(A) Data Communication is a part of Data Transmission

(B) Data Transmission is a part of Data Communication

(C) Data Communication and Data Transmission are synonyms

42. To transmit data between a Mobile Network and Internet which of the following is (are) needed ?

(A) Router (B) Gateway

(C) Border Gateway Protocol

43. When a machine that is present in a LAN is to receive a message transmitted through the Internet, then its Ethernet address is

(A) derived from its IP address itself (B) obtained from a router

(C) a part of the IP address

44. Pick the Odd one out

(A) GSM (B) CDMA (C) CSMA/CD

45. The device which accepts frames and transmits it over telephone lines is a

(A) Packet Switch Exchange (B) Modem

(C) Frame Relay

46. In the worst case execution of Insertion sort, the number of comparisons made to insert the Nth element is

(A) One (B) N-1 (C) N(N-1)

47. In the best case execution of Bubble sort, the number of comparisons made to put an nth element in its correct position is

(A) One (B) N-1 (C) N(N-1)

48. Best Case, Worst Case and Average Case of an algorithm depend on

(A) Input (B) No. of Loops

(C) No. of iterations

49. In a Binary Search, if $n=2^k-1$, then the number of iterations required to end in a successful or unsuccessful search is

(A) log n (B) $2^{k-1}-1$ (C) k

50. Which of the following about Branch and Bound is (are) True?

(A) Branch and Bound is a heuristic search technique

(B) Branch and Bound has a higher time complexity than that of Backtracking

(C) Branch and Bound and Back Tracking result in a sequence of optimal decisions

51. Why do most languages not specify the order of evaluation of arguments?

(A) Because it doesn't change the meaning of programs.

(B) Because it's already constrained by the precedence and associativity rules.

(C) Because many important code improvement techniques depend on being able to change the order.

52. Consider the following CFG:

list → *ids* ;

ids → *ids* , id

ids → id

Which of the following is a sentential form for this language?

(A) id, id, *ids* ; (B) *ids* , id, id;

(C) *ids* , *ids* ;

53. What is the significance of L-attributed attribute grammars?

(A) They can be evaluated in the course of an LL parse.

(B) They are the most general class of attribute grammars that can be evaluated in linear time.

(C) Their attribute flow is strictly bottom-up.

54. Which of the following is least likely to be used to generate code for a switch statement?

(A) hash table

(B) linear sequence of tests

(C) balanced search tree

55. What is a bootstrap compiler?

(A) A compiler for language x is written in language x

(B) A compiler for language x is written in language y

(C) A compiler for language x for platform a is written in language y in platform b

56. Why don't you need a static link in C?

(A) Because a display is used instead.

(B) Because there's already a separate frame pointer.

(C) Because C doesn't have nested subroutines.

57. Why does Java provide mix-in inheritance instead of full multiple inheritance?

(A) Because it avoids discontiguous objects.

(B) Because it imposes no costs on programs that use only single inheritance.

(C) Because it eliminates the distinction between replicated and shared repeated inheritance.

58. Why might one wish to pass a parameter by value/result, rather than by reference?

(A) To avoid the need for indirection

(B) To save space in the stack.

(C) To avoid modifying the argument.

59. Why are in-line functions useful?

(A) They eliminate subroutine-call linkage overhead.

(B) They enable the compiler to perform more code improvement.

(C) They may improve I-cache locality.

60. Under name equivalence, two variables have the same type if

(A) they have the same internal structure

(B) they can hold the same set of values

(C) they were declared using the same lexical occurrence of a type constructor

61. When it will be wrong with this initialization?

```
char *p = malloc(10);
```

(A) p is a static variable

(B) p is a global variable

(C) p is a external variable

62. What will happen, if you use the following fragment in your program?

```
typedef struct {
        char *item;
        NODEPTR next;
} *NODEPTR;
```

(A) compile-time error

(B) run-time error

(C) error-free execution

63. What will be the value of a[i] after the execution of the following statement, where i has the value 5?

```
a[i] = i++;
```

(A) 5 (B) 6 (C) no change

64.
```
# include <stdio.h>
void main()
{
int a=10,b=5; int c=3,d=3;
if ((a<++b) && (c=d++))
printf("%d %d %d %d", a,b,c,d);
else printf("%d %d %d %d", a,b,c,d);
}
```

(A) 10 5 3 4 (B) 10 6 3 3 (C) 10 5 3 3

65. Which is a ternary operator?

(A) ? (B) ^ (C) ~

66.

```
#include <stdio.h>
void main()
{
char *p="abc";
char *q="abc123";
while(*p=*q)
{
print("%c %c",*p,*q);
}
}
```

(A) aabbcc123 (B) compilation error

(C) infinite loop

67. Which of the following is invalid ?

(A) a*=b; (B) a>>=b; (C) a**=b ;

68. Identify the incorrect one

(A) if (c=1) (B) if (c!=3) (C) if (a<b) then

69. Which one has no L-Value

(A) a[i] (B) *(a+i) (C) 2

70.

```
main()
  {
   printf("\nab");
   printf("\bsi");
   printf("\rha");
  }
```

(A) asiha (B) absiha (C) hai

71. Which of the following is a valid C/C++ function pointer definition

(A) int *(f)(); (B) int* f(); (C) (int*)f();

72. What is "multiple inheritance"?

(A) When a parent class has two or more child classes

(B) When a base class has two or more derived classes

(C) When a child class has two or more parent classes

73. Which of the following is not a typical relationship in an object oriented system?

(A) Inheritance (B) Instantiation

(C) Aggregation

74. In the Booch notation, a cloud with a solid outline represents:

(A) a comment or explanatory note associated with a class.

(B) a class.

(C) an object.

75. Which of the following is one of Stroustrup's "rules-of-thumb" for object-oriented design?

(A) Optimize early (B) Maximize your interfaces

(C) Don't use public data members

76. What is "encapsulation"?

(A) The division of a program into independent modules

(B) The aggregation of data members within a class

(C) The aggregation of function members within a class

77. Which is the correct syntax if we wish class D to publicly inherit from class B?

(A) class D: public: B {}; (B) class D: public B {};

(C) class D public: B {};

78. Friend functions are useful because:

(A) They allow us to break the encapsulation of *any* class whenever we want to, which makes coding much easier since we don't have to worry about respecting the class interface.

(B) They allow us to break the encapsulation of other user-defined classes whenever we want, thereby enabling us to improve efficiency.

(C) They allow us to break encapsulation in a controlled manner, which ensures that efficiency does not compromise maintainability.

79. Apart from operator=, the operators most commonly overloaded are operator<< and operator>>. Why?

(A) Because left- and right-shifting is a very common task in programs.

(B) Because they make it easy to do I/O on user-defined classes.

(C) Because they are the easiest to overload.

80. If both MyClass::operator+ and MyClass::operator= are overloaded, what is the effect on MyClass::operator+=?

(A) MyClass::operator+= will automatically be made invalid, and the error message will suggest that the user use MyClass::operator+ and MyClass::operator= instead.

(B) MyClass::operator+= will automatically be overloaded to call MyClass::operator+ and then MyClass::operator=.

(C) MyClass::operator+= will automatically be overloaded to call MyClass::operator= and then MyClass::operator+.

81. Which of the following operators *cannot* be overloaded?

(A) (dot) (B) ::(scope resolution)

(C) ?: (conditional)

82. Here is a line of Java code: weeks_in_year = (int) tax_rate; Without having seen the types of the variables given during declaration, what is the most reasonable guess concerning them?

(A) weeks_in_year is an int and tax_rate is not.

(B) tax_rate is an int and weeks_in_year is not.

(C) Both weeks_in_year and tax_rate are ints.

83. Here is a line of code: System.out.println("Hello World"): In it, the word println is a(n):

(A) Class (B) Object (C) Method

84. What is the output of the following line of code: System.out.println("\\\"");

(A) \\ (B) \" (C) ""

85. Here is a line of code: Point mypoint = new Point(); The two occurrences of the word "Point" in the line are, respectively:

(A) A call to a constructor and a declaration of an object reference.

(B) Two declarations of an object reference.

(C) Two calls to a constructor.

86. The disadvantage with compile and go-loader is, it

(A) requires more memory (B) cannot handle complex functions

(C) cannot link library files.

87. Dynamic loading is also known as

(A) relocating loader (B) load-on-call

(C) overlay manager

88. Which of the following is not supplied by the assembler to the loader

(A) length of the object code

(B) relocation information

(C) starting address where object code is to be loaded

89. Parsing involves

(A) converting the source program into tokens

(B) syntactic analysis of tokens

(C) generation of pseudo code

90. Which of the following are machine independent assembler features?

(A) expressions& literals

(B) relocation

(C) addressing modes

91. Process framework activities are populated with

(A) milestones

(B) Work product

(C) QA points

92. The best project team organizational model to use when tackling extremely difficult problems is

(A) controlled centralized (B) democratic decentralized model

(C) controlled decentralized model

93. Incremental model differs from RAD in terms of

(A) operation model delivered with each increment

(B) faster development cycle

(C) c.handling complex problems

94. Process indicators enable a software project manager to

(A) assess the status of an on-going project

(B) track potential risks

(C) adjust work flow or tasks

95. Which of the following is an advantage of using function points (FP) as a measure of the functionality delivered by a software application?

(A) FP can be computed before a design is completed

(B) FP is a language dependent measure.

(C) FP is a function of LOC.

96. The simplest recovery technique is called ..... return.

(A) implicit (B) explicit (C) forced

97. An example for WYSIWYG is .....

(A) Windows

(B) MS DOS

(C) LaTeX

98. .....refers to a different set of activities that ensure that the software that has been built is traceable to customer requirements.

(A) Verification

(B) Validation

(C) Beta test

99. .....testing of software is predicated on close examination of procedural detail.

(A) Black-box

(B) White-box

(C) Gray-box

100. PCMM can be expanded as

(A) People Capability Maturity Model

(B) Process Capability Maturity Model

(C) Product Capability Maturity Model