

Computer Science and Applications Paper II

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Note : This Paper contains **Fifty (50)** multiple-choice questions, each question carrying **Two (2)** marks. Attempt *All* of them.

1. How many elements are there in the set $\{\Phi, \{\Phi\}\}$?

- (A) Φ
- (B) 1
- (C) 2
- (D) Power set of 2

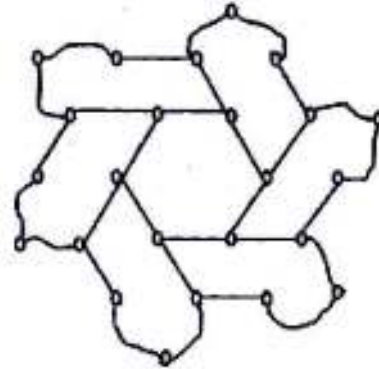
2. You are given an array of integers and asked to reverse it without using any additional memory. How many assignments would be required in your algorithm ?

- (A) $n/2$ or $(n + 1)/2$
- (B) $3n/2$
- (C) $n(n + 1)/2$
- (D) ∞

3. You are to convey a message to your friend whether your mission is successful or not. What is the redundancy if you employ a single error detection code while transmitting the message ?

- (A) -1
- (B) $\frac{1}{2}$
- (C) 1
- (D) 2

4. The *nabhi kamal* graph (see figure) is :



- (A) A bipartite graph
- (B) A semi-Hamiltonian graph
- (C) Both A and B
- (D) Neither A nor B

5. Which of the following is *not* a valid word of the language $((00)^*(10)^*(01)^*(11)^*) \cup ((11)^*(01)^*(10)^*(00)^*)$:
- (A) 110011010100
(B) 010110011010
(C) 0010101101
(D) 101010111
6. $A' + B' + C'$ is the combinational function for :
- (A) OR gate
(B) NOR gate
(C) AND gate
(D) NAND gate
7. Which of the following logic families is the fastest ?
- (A) TTL
(B) DTL
(C) ECL
(D) MOS
8. $(123)_4 + (211)_3 =$
- (A) 45
(B) 47
(C) 49
(D) 51
9. The largest decimal number that can be represented by 11 bits is :
- (A) 1023
(B) 1024
(C) 2047
(D) 2048
10. The function $f(x, y, z) = \sum(2, 6, 7)$ is :
- (A) $xy + yz'$
(B) $xz + yz'$
(C) $xy' + yz$
(D) $xy + yz'$

11. main()

```
{
    int i=-1, j=-1, k=0, l=2,m;
    m=i++&&j++&&k++||l++;
    printf("%d%d%d%d%d",
           i,j,k,l,m);
}
```

- (A) 00130
 (B) 00121
 (C) 00131
 (D) 00120

12. Give the output of

```
main( )
{
    signed char i = 0;
    for(; i>=0; i++);
    printf("%d",i);
}
```

- (A) infinite loop
 (B) -128
 (C) 0
 (D) 32767

13. Give the output of

```
#include<stdio.h>
main( )
{
    char s[]={‘a’,‘b’,‘c’,‘\n’,‘c’,‘\0’};
    char *p, *str, *strl;
    p=&s[3];
    str=p;
    strl=s;
    printf(“ %d ”, ++ * p + ++ *
           strl-32);
}
```

- (A) 75
 (B) 74
 (C) 77
 (D) 76

14. Virtual function is useful to achieve.....

- (A) early binding
 (B) static binding
 (C) static linking
 (D) run time polymorphism

15. Which of the statements below are *true* ?

- (i) Template functions can be overloaded.
- (ii) Traits of one class may be overloaded.
- (iii) The friend functions cannot directly access private data of a class.
- (iv) In multilevel inheritance, the constructors are executed in the reverse order of inheritance.

- (A) Only (i)
- (B) (i) and (ii)
- (C) (i) and (iii)
- (D) All of the above

16. Which of the following provides the conceptual schema for a relational database ?

- (A) Entity Relationship Diagram
- (B) Data Flow Diagram
- (C) State Diagram
- (D) Data Dictionary

17. Which database normal form contains no partial dependencies on a concatenated key ?

- (A) 1 NF
- (B) 2 NF
- (C) 3 NF
- (D) 4 NF

18. DROP TABLE table_1;

The above SQL statement corresponds to which of the following language ?

- (A) DDL
- (B) DCL
- (C) DML
- (D) None of the above

19. DELETE statement in SQL is used to :

- (A) Remove a database
- (B) Remove a table from a database
- (C) Remove a record from a table
- (D) Remove a field from a table

20. Which of the following statements is *not* applicable to an 'Index' in a database ?

- (A) It needs increased storage space
- (B) It improves the speed of data retrieval
- (C) It reduces the speed of data write
- (D) It improves the speed of data updation

21. Ackerman's function is defined on the non-negative integers as follows

$$\begin{aligned}
 a(m,n) &= n+1 \text{ if } m=0 \\
 &= a(m-1, 1) \text{ if } m > 0, n=0 \\
 &= a(m-1, a(m, n-1)) \\
 &\quad \text{if } m > 0, n > 0
 \end{aligned}$$

The value of (1, 3) is :

- (A) 4
- (B) 5
- (C) 6
- (D) 7

22. A sort which relatively passes through a list to exchange the first element with any element less than it and then repeats with a new first element is called :
- (A) insertion sort
 - (B) selection sort
 - (C) heap sort
 - (D) quick sort
23. Which of the following sorting algorithms does *not* have a worst case running time of $O(n^2)$?
- (A) Insertion sort
 - (B) Merge sort
 - (C) Quick sort
 - (D) Bubble sort
24. What data structure would you most likely see in a non-recursive implementation of a recursive algorithm ?
- (A) Stack
 - (B) Linked list
 - (C) Queue
 - (D) Tree
25. A B-tree of minimum degree t can have maximum.....pointers in a node.
- (A) $t-1$
 - (B) $2t-1$
 - (C) $2t$
 - (D) T

26. The IP address 129.10.52.1 is contained in which class ?

- (A) A
- (B) B
- (C) C
- (D) D

27. The most common protocol for dynamically assigning Internet addresses is the :

- (A) Dynamic Internet Configuration Protocol
- (B) Static Internet Configuration Protocol
- (C) Dynamic Host Configuration Protocol
- (D) Static Host Configuration Protocol

28. Which standard specifies how to create a directory system to maintain e-mail user names and their network addresses ?

- (A) X.400
- (B) X.500
- (C) X.600
- (D) X.700

29. Which of the following is *not* part of the frame relay frame format ?

- (A) Address
- (B) Device location
- (C) Frame check sequence
- (D) Flag

30. How many possible unique pairings of letters are available with mono-alphabetic ciphers ?

- (A) 10^2
- (B) 10^{26}
- (C) 10^{260}
- (D) 10^{2600}

31. Table created during Lexical analysis :

- (A) Terminal table
- (B) Identifier table
- (C) Literal table
- (D) All of the above

32. Find out the odd one :

- (A) Tokens
- (B) Scanner
- (C) Syntactic analyzer
- (D) Code template

33. Parsing is.....stage of translation.

- (A) First
- (B) Second
- (C) Third
- (D) None of the above

34. For lexical analysis automaton used is :

- (A) Turing Machine
- (B) Push Down Automaton
- (C) Finite Automaton
- (D) None of the above

35. Interpreter is also called as :

- (A) Abstract Machine
- (B) Absolute Machine
- (C) Virtual Machine
- (D) None of the above

36. How is a file characterized in an operating system ?

- (A) The underlying storage mechanism for a database management system
- (B) A DOS mechanism for referencing BIOS information
- (C) A Unix mechanism that allows users to protect their persistent data
- (D) A named, linear sequence of bytes

37. In a processor with a mode bit, privileged instructions are executed :

- (A) Independently of the mode bit setting
- (B) Only by a system administrator program
- (C) Only when the mode bit is set to supervisor
- (D) Only when the mode bit is set to user

38. A memory word is defined by :

- (A) the "width" of the memory
- (B) the size of the data path between the CPU and memory
- (C) the size of the target datum in the machine
- (D) the size of the general registers in the machine

39. Assume that a system has a single CPU system with a mean inter-arrival time of 20 jobs/minute, and each job has a mean service time of 2 seconds. What is the expected fraction of the time the CPU will be busy ?

- (A) 40%
- (B) 66.7%
- (C) 83.3%
- (D) 87.5%

40. Which command is used to sort the lines of data in a file in reverse order ?

- (A) Sort
- (B) Sh
- (C) St
- (D) Sort-r

41. The scale for cohesion is :

- (A) Linear
- (B) Random
- (C) Non-linear
- (D) Both (A) and (B)

42. The measure of software complexity is based on :

- (A) Number of Man years
- (B) Number of Lines of Code (LOC)
- (C) Number of function points
- (D) All of the above

43. A pathological connection indicates :

- (A) Lose coupling
- (B) Control coupling
- (C) Tight coupling
- (D) None of the above

44. An iterative process through which requirements are translated into a *blue print* for developing the software is :

- (A) Requirement analysis
- (B) Software design
- (C) Software coding
- (D) Software requirement specification

45. Modularity and concept of abstraction enables the engineer to :

- (A) Re-use the software components
- (B) Increase interdependencies among the modules
- (C) Increase highest possible coupling
- (D) Lower the cohesion

46. Message Passing Interface is a tool to perform :

- (A) Parallel Computing
- (B) Virtual Computing
- (C) Cloud Computing
- (D) None of the above

47. Digital radio signals were introduced in which generation of cellular telecom networks ?

- (A) 1G
- (B) 2G
- (C) 3G
- (D) 4G

48. Which card allows its holder to buy goods and services based on the holder's promise to pay for these goods and services ?

- (A) Credit Card
- (B) Debit Card
- (C) Credit and Debit Cards
- (D) None of the above

49. Which Data Mining technique attempts to find a function which models the data with least error ?

- (A) Association Rule Learning
- (B) Clustering
- (C) Classification
- (D) Regression

50. Which of the following is *not* considered as a resource in Windows programming ?

- (A) Images
- (B) Source code
- (C) Menu bars
- (D) Tool bars

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