DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

T.B.C. : 22/15/ET **Booklet Sr. No.....**

0165

TEST BOOKLET

COMPUTER SCIENCE AND APPLICATION

Paper II

Time Allowed : $1\frac{1}{4}$ Hours] [Maximum Marks : 100

All questions carry equal marks.

INSTRUCTIONS

1. Write your Roll Number only in the box provided alongside. Do not write anything else on the Test Booklet.
2. This Test Booklet contains **50** items (questions). Each item comprises four responses (answers). Choose only one response for each item which you consider the best.
3. After the candidate has read each item in the Test Booklet and decided which of the given responses is correct or the best, he has to mark the circle containing the letter of the selected response by blackening it completely with ball point pen as shown below. *H.B. Pencil should not be used* in blackening the circle to indicate responses on the answer sheet. In the following example, response "C" is so marked :

4. Do the encoding carefully as given in the illustrations. While encoding your particulars or marking the answers on answer sheet, you should blacken the circle corresponding to the choice in full and no part of the circle should be left unfilled. You may clearly note that since the answer sheets are to be scored/evaluated on machine, any violation of the instructions may result in reduction of your marks for which you would yourself be responsible.
5. You have to mark all your responses ONLY on the ANSWER SHEET separately given. *Responses marked on the Test Booklet or in any paper other than the answer sheet shall not be examined.* Use ball point pen for marking responses.
6. All items carry equal marks. Attempt all items.
7. Before you proceed to mark responses in the Answer Sheet fill in the particulars in the front portion of the Answer Sheet as per the instructions.
8. After you have completed the test, hand over the OMR answer-sheet to the Invigilator.

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Time Allowed : $1\frac{1}{4}$ Hours] [Maximum Marks : 100

Note :—This paper contains *fifty* **(50)** multiple choice questions. Each question carrying *two* **(2)** marks. Attempt *all* questions.

1. Let us consider a hypothetical computer that has an instruction which computes the sum of five numbers. How many addition instructions will be executed to find sum of sixty five numbers ?

(A) 64 (B) 32

(C) 16 (D) 13

2. Two bracelets are said to be indistinguishable if the rotation of one will yield another. Determine the number of distinct bracelets of three beads made up of red and green beads :

(A) 3 (B) 4

(C) 5 (D) 6

3. A rooming house has 90 rooms and 100 guests. Keys are to issued to the guests so that any 90 guests can have access to the 90 rooms in the sense that each guest will have a key to an unoccupied room. Determine the minimum total number of keys for the above allocation :

(A) 100 Keys (B) 490 Keys

(C) 780 Keys (D) 990 Keys

4. Ten men went to a party and checked their hats when they arrived. The hats were randomly returned to them when they departed. What is the probability that no man gets his own hat back ?

(A) ~ 0.37 (B) ~ 0.63

(C) ~ 0.86 (D) ~ 0.14

5. Determine the number of integers between 1 and 250 that are divisible by any of the integers 2, 3, 5 and 7 :

(A) 125 (B) 208

(C) 258 (D) 193

6. If a number is stored in shift register, if we shift the content to left by one bit, then it is equivalent to..... .

(A) multiplication by two

(B) division by two

(C) addition by two

(D) subtraction by two

7. In a normal n-bit adder, to find out if an overflow we make use of..... .

(A) NAND gate

(B) XOR gate

(C) AND gate

(D) NOR gate

8. With respect to a D Latch, which of the following is *correct* ?

(A) The Q output follows the D input when EN is LOW

(B) The Q output is opposite of the D input when EN is LOW

(C) The Q output is HIGH regardless of EN's input state

(D) The Q output follows the D input when EN is HIGH

9. In Octal, the twelve bit two's complement of the hexadecimal number DBC_{16} is :

(A) 0163_8

(B) 1063_8

(C) 1163_8

(D) 0063_8

10. Simplification of the Boolean expression :

AB + ABCD + ABCDE + ABCDEF

yields which of the following results ?

(A) AB + CD + EF

(B) A + B + C + D + E + F

(C) ABCDEF

(D) AB

11. Associativity of which operator is right to left :

(A) ( )

(B) [ ]

(C) & &

(D) !

12. Find the value of the expression $++n\ -k\ --$ when $k = -1$, $n = 1$:

(A) 0 (B) 1

(C) 2 (D) 3

13. Find the value of the expression $n = n + + * 2 + - -k$ when $n = 1$ and $k = -1$:

(A) 0 (B) 1

(C) 2 (D) 3

14. Give the output of the following program when $i = 3$

```
main ( )
{
    int x[ ] = {10, 20, 30, 40, 50};
    int i;
    for (i = 0; i < = 4; i + +)
    {
        *(x + i) = x [i] + i [x];
        printf (" % d", *(x + i))
}
```

(A) 80 (B) 60

(C) 40 (D) 30

15. What does the following code segment return ?

```
int f (str)

Char * str;

{

    int i;

    for (i = 0; *str ++; i ++);

    return i;

    }
```

(A) length of str

(B) *i*th character in str

(C) last character of the str

(D) Nothing

16. When we use shared/exclusive locking scheme, the system must enforce :

(A) A transaction T must issue the operation read-lock (x) *or* write-lock (x) before any read-item (x) operation

(B) A transaction T must issue operation write-lock (x) before any write-item (x)

(C) A transaction T must issue unlock (x) after all read-item (x) and write-item (x)

(D) T can issue a read-lock (x) operation even if it already holds a read (shared) lock or a write (exclusive) lock on item (x)

17. The main property of OID is that it is :

(A) immutable

(B) structured

(C) visible

(D) mutable

18. BE does not use the.....style of SQL it is considered as.....dimensional language.

(A) SELECT, FROM, WHERE, ONE

(B) linear, two

(C) SELECT, FROM, WHERE, TWO

(D) Trivial, two

19. The commonly used model for multilevel security in databases is :

(A) BIBA model

(B) Wall of China model

(C) Bell-La Padula model

(D) R BAC model

20. Which of the following is based on multivalued dependency ?

(A) SECOND NF

(B) THIRD NF

(C) BCNF

(D) FOURTH NF

21. Which of the following trees is best used for indexing external data ?

(A) Binary search tree

(B) AVL tree

(C) B-tree

(D) Strictly binary tree

22. Locating a particular item in the binary search tree of n nodes requires atmost comparisons :

(A) n

(B) $2n$

(C) $\frac{n}{2}$

(D) $\log n$

23. The value of which of the following growth rate functions grows the fastest ?

(A) $O(2^{\log_2 n})$

(B) $O(n^2)$

(C) $O(\log_2 n)$

(D) $O(n \log n)$

24. There are several factors that affect the efficiency of lookup operations in a hash table which of the following is *not* one of these factors ?

(A) Number of elements stored in the hash table

(B) Number of buckets in the hash table

(C) Quality of the hash function

(D) Size of elements stored in the hash table

25. Given a binary search tree, which traversal would print the values in the nodes in sorted order ?

(A) Postorder

(B) Inorder

(C) Preorder

(D) All of these

26. MP3 is based on :

(A) Waveform coding

(B) Perceptual coding

(C) Adaptive coding

(D) None of these

27. The standard X. 509 is a way to :

(A) describe certificate

(B) describe ethernet

(C) describe internet

(D) describe intranet

28. MAC address consists of :

(A) 24 bits

(B) 36 bits

(C) 48 bits

(D) 64 bits

29. The sending of a packet from one sender to multiple receivers with a single send operation is called :

(A) Multitask

(B) Multiprogramming

(C) Multicast

(D) Unitask

30. In IP_{V4}, the datagram must be dropped when time-to-live (TTL) reaches to :

(A) 0

(B) 1

(C) 2

(D) 4

31. The set of languages difined by context free grammars is :

(A) the set of regular languages

(B) finite

(C) the set of PDA-recognized languages

(D) the set of decidable languages

32. Which of the following definitions generates the same language as L,

$L = \{ww^R \mid w \in \{0,1\}^*\}$:

(A) $S \rightarrow 0S\,1 \mid 1S0 \mid \in$

(B) $S \rightarrow 0S0 \mid 1S1 \mid \in$

(C) $S \rightarrow 0S1 \mid 1S0 \mid 0S0 \mid 1S1 \mid \in$

(D) $S \rightarrow 0S1 \mid 1S0 \mid 0S0 \mid 1S1$

33. Given the following *two* languages :

$L_1 = \{0^m 1^m \mid m \geq 1\} \cup \{0\}$

$L_2 = \{W \subset W^R \mid W \in \{0,1\}^*\}$

Which statement is *correct* ?

(A) L_1 is deterministic and L_2 is not deterministic

(B) L_1 is not deterministic and L_2 is deterministic

(C) both L_1 and L_2 are deterministic

(D) both L_1 and L_2 are not deterministic

34. Match the following :

	List I		List II
(*a*)	Regular grammar	(*i*)	$S \rightarrow 1SS \mid 0S \mid C$
(*b*)	Chomsky normal form	(*ii*)	$S \rightarrow 0SS \mid 0S \mid 1$
(*c*)	Greibach normal form	(*iii*)	$S \rightarrow AS \mid 0$ $A \rightarrow SA \mid 1$
(*d*)	S grammar	(*iv*)	$S \rightarrow 0S \mid 1$

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*iv*)	(*iii*)	(*i*)	(*ii*)
(B)	(*iv*)	(*iii*)	(*ii*)	(*i*)
(C)	(*iv*)	(*ii*)	(*iii*)	(*i*)
(D)	(*iv*)	(*ii*)	(*i*)	(*iii*)

35. The grammar 'G_1'

$S \rightarrow aSa|bSb|a|b$

and the grammar 'G_2' is

$S \rightarrow 0S|0S1|X$

$X \rightarrow X0|0$

Which of the following is *correct* ?

(A) G_1 is ambiguous and G_2 is unambiguous

(B) G_1 is unambiguous and G_2 is unambiguous

(C) G_1 is ambiguous and G_2 is ambiguous

(D) G_1 is unambiguous and G_2 is ambiguous

36. A new process in UNIX can be created by which of the following system call ?

(A) Process-ID = fork ( )

(B) fork ( ) = Process-ID

(C) Process-ID = child ( )

(D) Child ( ) = Process-ID

37. Operating system maintains the page table for..... .

(A) each address

(B) each thread

(C) each process

(D) each instruction

38. If the wait for graph contains cycle :

(A) then a deadlock does not exist

(B) then a deadlock exist

(C) then the system is in a safe state

(D) then a starvation exist

39. Mapping of network file system protocol to local file system is done by..... .

(A) remote mirror

(B) local file system

(C) network file system

(D) volume manager

40. Which of the following is *not* a communication command (in UNIX OS) ?

(A) write
(B) mesg
(C) mail
(D) grep

41. .....analysis is most important phase of SDLC.

(A) Requirement
(B) Design
(C) Testing
(D) Coding

42. Which of the following is *not* another name for white box testing ?

(A) structural testing
(B) glass box testing
(C) transparent testing
(D) decision table testing

43. Which of the following metrics is used to assess design quality ?

(A) Functionality delivered
(B) complexity metric
(C) Component level metric
(D) In-process metric

44. Which of the following metrics can be used to assess the complexity of the source code ?

(A) Interface design metrics

(B) Halstead metrics

(C) In-process metrics

(D) Architectural metrics

45. The integrity of a system can be defined as :

(A) Integrity = $\sum [1 - (\text{risk} \times (1 - \text{security}))]$

(B) Integrity = $\sum [1 - (\text{protection} \times (1 - \text{security}))]$

(C) Integrity = $\sum [1 - (\text{threat} \times (1 - \text{security}))]$

(D) Integrity = $\sum [1 - (\text{defects} \times (1 - \text{security}))]$

46. Using....., cell phone operators can predict the number of weekend minutes that a person will use.

(A) decision trees

(B) market basket analysis

(C) k-means

(D) Regression analysis

47. A characteristic of a measure is called a..... .

(A) drill down (B) roll up

(C) dimension (D) report

48. Registered activeX control in windows :

(A) Class wizard (B) App wizard

(C) Gallery (D) Resource wizard

49. What is handled by C Document class in MFC application ?

(A) Information (B) Data

(C) Method (D) All of these

50. In a GSM system BTS and BSC together form..... .

(A) Network substation

(B) Base station subsystem

(C) Maintenance subsystem

(D) Operational system.