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

T.B.C. : 14/13/ET Booklet Sr. No.....497.....

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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COMPUTER SCIENCE AND APPLICATION

Paper II

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

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

1. The output of lexical analyzer is :

   (A) Parse tree
   (B) Regular expression
   (C) Set of tokens
   (D) Strings of character

2. Shift reduce parsers are :

   (A) Bottom up parsers
   (B) Top down parsers
   (C) Bottom up for shift and top down for reduce
   (D) Bottom up for reduce and top down for shift

3. Relational databases establish relationships between entities by means of common fields included in a file is called a/an :

   (A) Relationship
   (B) Association
   (C) Entity
   (D) Relation

4. An *r*-value :

   (A) can have a value fetched from it
   (B) is designed for use by a right-handed person
   (C) is an expression that can be only placed on the right of any operator such as +, *, /, etc.
   (D) can never be assigned a value

5. A UNIX process does *not* contain :

(A) Thread segment

(B) Text segment

(C) Data segment

(D) Stack segment

6. Given an undirected graph G with 21 nodes. The maximum number of edges that can be included, so that the graph G has two connected components, is :

(A) 20 (B) 231

(C) 190 (D) 210

7. Given inorder and preorder traversals of a binary tree as :

Inorder	**Preorder**
A	E
B	A
C	C
D	B
E	D
F	G
G	F

The postorder traversal of the binary tree is :

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

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

8. Linear probing suffers from ..... and quadratic probing suffers from ..... in hashing.

(A) quadratic clustering, primary clustering

(B) primary clustering, quadratic clustering

(C) non-uniform clustering, collision

(D) none of the above

9. If $n \geq 1$, then for any n-key B-tree T of height h, and minimum degree $t \geq 2$, then :

(A) $h \leq \log_t n$

(B) $h \geq \log_t \left(\frac{n+1}{2}\right)$

(C) $h \leq \log_t \left(\frac{n+1}{2}\right)$

(D) $h \geq \log_t n$

10. Consider the class inheritance :

```
Class B
{    public :
          B( );
          B(int nn);
          void f( );
          void g( );
     private :
          int n;
};
Class D : public B
{    public :
          D(int nn, double dd);
          void h( );
     private :
          double d;
};
```

How many public members does an object of class D have ?

(A) 2

(B) 6

(C) 5

(D) 4

11. A ..... specifies the number of instances of one entity that can be associated with each instance of another entity.

(A) limit
(B) counterconstraint
(C) degree
(D) cardinality constraint

12. In uniprocessor system, multiprogramming increases processor efficiency by :

(A) taking advantage of time wasted by long wait interrupt handling
(B) Disabling all interrupts except those of highest priority
(C) Eliminating all idle processor cycles
(D) Increasing processor speed

13. In the division method for creating hash functions, $h(k) = k \bmod m$. A good choice for m is :

(A) large composite number
(B) double the number of keys to be inserted
(C) large prime number
(D) large prime number and double the number of keys to be inserted

14. The maximum number of nodes in a B-tree of height h and degree t is (depth of root is 0) :

(A) $2t^h - 1$

(B) $t^h - 1$

(C) $\frac{t^{h+1} - 1}{t - 1}$

(D) $\frac{t^h - 1}{t - 1}$

15. Which of the following can be virtual ?

(A) Constructors

(B) Static functions

(C) Destructors

(D) Friends functions

16. An integrity control supported by a DBMS is :

(A) Security

(B) GUI guards

(C) Range control

(D) Substitute estimates

17. Which is *not* a tangible element of a modern process ?

(A) Address space

(B) Process data

(C) Program

(D) Execution stack

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

(A) 231 (B) 195

(C) 193 (D) 229

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

(A) 0.184 (B) 0.368

(C) 0.632 (D) 0.816

20. In which type of file multiple key retrieval is *not* possible ?

(A) Hashed (B) Sequential

(C) Indexed (D) Clustered

21. Which statement about disabling interrupts to resolve race conditions is *wrong* ?

(A) In theory, a program can disable interrupts when it enters a critical section, and re-enable interrupts when finished with a critical section, to eliminate race conditions

(B) Disabling/enabling interrupts may negatively affect the I/O system

(C) Programs with infinite loops in their critical sections are a significant problem with interrupt-based approach

(D) User mode programs are the best place to invoke disable interrupt( )

22. Let us consider a hypothetical computer that has an instruction which computes the sum of five numbers. Suppose we want to find the sum of sixty five numbers, $x_1, x_2, \ldots\ldots\ldots\ldots, x_{65}$. The addition instruction will always executes ..... times.

(A) 65 (B) 13

(C) 14 (D) 16

23. Let a * H and b * H be two cosets of H. Which of the following is *true* ?

(A) a * H and b * H are disjoint

(B) a * H and b * H are identical

(C) Either a * H and b * H are disjoint or they are identical

(D) a * H and b * H are disjoint, and they are identical

24. The ..... fstream member function closes a file stream.

(A) eof( ) (B) close( )

(C) open( ) (D) flush( )

25. Indexes are created in most RDBMs to :

(A) Increase the cost of implementation

(B) Provide rapid random and sequential access to base-table data

(C) Provide a quicker way to store data

(D) Decrease the amount of disk space utilized

26. An undirected graph possesses an Eulerian path if and only if it is connected and has .....

(A) two vertices of odd degree

(B) two vertices of even degree

(C) either zero or two vertices of odd degree

(D) either zero or two vertices of even degree

27. The ..... states the process that owns the page.

(A) page number

(B) process identifier

(C) chain pointer

(D) control bits

28. Which one of the conditions that follow will be false (value of 0) after execution of the program segment below ?

```
int v[5] = {0, 0, 0, 0, 1};
int k, j;
for (j=3; j>=0; --j)
    for(k=j; k < 4; ++k)
        v[k] + = v[k + 1];
```

(A) v[0] = = v[4]

(B) v[0] < v[1]

(C) v[1] < v[2]

(D) v[2] < v[3]

29. Which type of file is most efficient with storage space ?

(A) clustered

(B) sequential

(C) hashed

(D) indexed

30. The minimum number of states required to represent $L_1 = \{a^n\ b \mid n \geq 0\}$ in deterministic finite automation is :

(A) 2

(B) 3

(C) 4

(D) 5

31. YACC builds up :

(A) Canonical LR parsing table (B) SLR parsing table

(C) LALR parsing table (D) None of these

32. Context free grammar can be recognized by :

(A) Deterministic finite automaton

(B) Non-deterministic finite automaton

(C) Pushdown automaton

(D) Two-way linear bounded automaton

33. The software development is found to proceed linearly, which model is best ?

(A) Prototype (B) Spiral

(C) Waterfall (D) Iterative

34. The feature which is present in spiral model but not in other models is :

(A) quality (B) performance

(C) efficiency (D) risk

35. Given module A and module B, complete data structure can be passed from one module to another module. This type of coupling is :

(A) Data
(B) Stamp
(C) External
(D) None of these

36. Which one of the following is used as primary media for communicating software design information ?

(A) Design entity
(B) Design view
(C) Entity attribute
(D) SDD

37. 'Fan in' of a component A is :

(A) Number of components related to A
(B) Number of components that can pass control to A
(C) Number of components dependent on A
(D) None of the above

38. Functional testing is called as :

(A) Structural testing
(B) Regression testing
(C) Behaviour testing
(D) Maintenance testing

39. What are number of keys used in secret key cipher ?

(A) 0 (B) 1

(C) 2 (D) 3

40. Firewalls are used for :

(A) avoiding attack on computer network

(B) making distributed system

(C) making LAN

(D) none of the above

41. Which of the following is used at data link layer ?

(A) Router (B) Hub

(C) Bridge (D) None of these

42. ATM has a reference model :

(A) Similar to OSI refernece model

(B) Similar to TCP/IP

(C) Similar to OSI but different from TCP/IP

(D) Different from both OSI and TCP/IP

43. Which one of the following is best for LAN ?

(A) Twisted pair

(B) Coaxial cable

(C) Fibre optic cable

(D) None of these

44. In OSI reference model which of the layers is concerned with syntax and semantics of the information transmitted :

(A) Physical layer

(B) Transport layer

(C) Presentation layer

(D) None of these

45. Hexadecimal equivalent of the binary number 1101101010111 is :

(A) B571

(B) 1B57

(C) 15B7

(D) 17B5

46. Floating point representation of 17.5×10^{-3} in biased 128 exponent is :

(A) $.175 \times 10^{127}$

(B) 17.5×10^{125}

(C) 175×10^{124}

(D) None of these

47. Simplification of the following K-map is :

AB \ CD	00	01	11	10
00	0	0	0	1
01	0	1	1	1
11	0	1	1	1
10	0	0	0	1

(A) AD' + C'D + AC'

(B) A'D + C'D + A'C

(C) BD + BC + CD'

(D) BD + BC + C'D

48. Flip-flop is a :

(A) Monostable device

(B) Bistable device

(C) Tristable device

(D) Quadstable device

49. Express the following in predicate logic :

No O or P can F

(A) $\neg \exists x(P(x) \vee O(x)) \vee F(x)$

(B) $\neg \exists x(P(x) \vee O(x)) \wedge F(x)$

(C) $\neg \exists x(P(x) \wedge O(x)) \wedge F(x)$

(D) None of these

50. Which of the following states is race condition in R-S flip-flop (NAND gate used to design R-S flip-flop) ?

(A) 00

(B) 11

(C) 10

(D) 01