T.B.C. : 22/14/ET Booklet Sr. No. ....

652

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.

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. Consider the following Boolean expression

    $$C(B + C) (A + B + C)$$

    Simplifiction of which yields the following results :

    (A) A

    (B) B

    (C) C

    (D) None of these

2. Which of the following is tautology ?

    (A) a ∨ (a → b)

    (B) (a ∨ b) → b

    (C) a ∨ (b → a).

    (D) None of these

3. Give the output of the following program :

```
main( )
{
        int p, q;
        p = –8, q = –5;
        doit(p, &q)
        printf("%d%d", p,q)
}
        doit (int p, int*q)
            {
            p = p*p;
            *q = *q**q;
            }
```

    (A) 8 25

    (B) 64 25

    (C) –8 25

    (D) – 64 25

4. Give the output of the following program when i = 4 :

```
main( )

{

    inty[ ] = {3, 5, 7, 9, 11, 13};

    for (i = 0, i< = 4; i++)

        {

            *(y+i) = i[y]* y[i];

            printf("%d", *(y+i))

        }
}
```

(A) 81

(B) 121

(C) 11

(D) syntax error

5. Associativity of which operator is right to left ?

(A) &&

(B) [ ]

(C) ( )

(D) ++

6. Find the value of the expression m++ ....k when k = –1, m = 0.

(A) 0

(B) 1

(C) 2
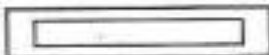
(D) 3

7. Find the value of the expression

m+ = ++k * 2 when k = −1 and m = 0.

(A) 0   (B) 1

(C) 2   (D) 3

8. In relational model of DBS, the constraints that can be directly expressed in schemes of the data model by specifying them in DDL is called :

(A) Implicit constraints

(B) Explicit constraints

(C) Semantic contraints

(D) Domain constraints

9. In an ER diagram the symbol [▭] is used for :

(A) Relationship   (B) Weak Entity

(C) Attribute   (D) Key

10. In SQL a query is evaluated conceptually by first applying .... clause.

   (A) FROM

   (B) WHERE

   (C) SELECT

   (D) HAVING

11. The notation $F \models X \rightarrow Y$ denotes that FD $X \rightarrow Y$ is inferred from the set of FDsF.

   $\{X \rightarrow Y, WY \rightarrow Z\} \models F1$, where F1 is a functional dependency :

   (A) $X \rightarrow Z$

   (B) $X \rightarrow WY$

   (C) $WX \rightarrow Z$

   (D) $Y \rightarrow Z$

12. Which one of the following is *incorrect* ?

   (A) Every relation in BCNF is also in 3NF

   (B) A relation in 3NF is not necessarily in BCNF

   (C) A relation schema R is in 2nd normal form if every non-prime attribute A in R is partially dependent on any key of R

   (D) A relation schema R is in 3NF if, whenever a non-trivial FD $X \rightarrow A$ holds in R either X is a super key of R or A is a prime attribute of R

13. Let N be a node in a B-tree. If N has m subtrees S_0, S_1, ..., S_{m-1} and N's key values are K_1, K_2, ..., K_{m-1} then which of the following statements is true ?

(A) all values in subtree S_0 are greater than K_1

(B) all values in subtree S_1 are less than K_1

(C) all values in subtree S_{m-2} are greater than K_{m-2}

(D) all values in subtree S_{m-1} are less than K_{m-1}

14. The maximum number of comparisons for a retrieval operations in a binary search tree is the :

(A) half of the length of the tree

(B) height of the tree

(C) number of nodes in a tree

(D) number of leaves in a tree

15. What is the infix version of the following postfix expression ?

$$xa + zby + c*/+$$

(A) $x + a + z/((b + y) * c)$

(B) $(x + a + z)/(b + y * c)$

(C) $x + a + z/b + y * c$

(D) $x + a + z/(b + y) * c$

16. For every node in .... tree, the height of its left subtree and right subtree differ at most by one.

   (A) Threaded binary

   (B) Binary search

   (C) Strictly binary

   (D) AVL

17. Suppose we are debugging a quicksort implementation that is supposed to sort an array in ascending order. The contents of the array after the first partition step are in the following order :

   4 10 2 15 18 25 23 21

   Which of the following statements is *correct* about the partition step ?

   (A) The pivot could have been 15, but could not have been 18

   (B) The pivot could have been 18, but could not have been 15

   (C) The pivot could have been either 15 or 18

   (D) Neither 15 nor 18 could have been the pivot

18. LAN address is .... long.

(A) Two byte   (B) Four byte

(C) Six byte   (D) Eight byte

19. Bluetooth gadgets forms a small network referred to as a/an ....

(A) Internet   (B) Piconet

(C) Nanonet   (D) Miconet

20. If the client and server are using persistent HTTP, then throughput the duration of the persistent connection the client and server exchange HTTP messages via the ....

(A) same server socket

(B) different server socket

(C) server socket is not required

(D) none of the above

21. A web cache is also called :

 (A) internet server

 (B) intranet server

 (C) proxy server

 (D) web server

22. The problem of station not being able to detect a potential competitor for the medium because the competitor is too far away is called :

 (A) exposed station problem

 (B) hidden station problem

 (C) packet collision problem

 (D) channel collision problem

23. Lexical analysis is normally done by :

 (A) table lookup

 (B) parsing

 (C) a pushdown automaton

 (D) a deterministic finite automaton

24. Pushdown automaton .... context free languages.

    (A) are a superset of   (B) are the same thing as

    (C) generates   (D) accepts

25. Non-deterministic finite automaton accepts :

    (A) not as many languages as deterministic finite automaton (DFA)

    (B) more languages than DFAs

    (C) the same languages as DFAs

    (D) context free languages

26. The complement of a regular language is :

    (A) not regular language

    (B) regular language

    (C) perhaps regular, perhaps not regular

    (D) finite

27. Given the following two grammars :

$$G_1 : S \rightarrow AB|00B$$

$$A \rightarrow 0|A0$$

$$B \rightarrow 1$$

$$G_2 : S \rightarrow 0S1S|1S0S|\in$$

Which statements is *correct* ?

(A) G_1 is ambiguous and G_2 is unambiguous

(B) G_1 is unambiguous and G_2 is ambiguous

(C) both G_1 and G_2 are ambiguous

(D) both G_1 and G_2 are unambiguous

28. If more than one thread is trying to lock the same mutex then :

(A) No one is allowed to switch the mutex from unlocked to locked

(B) Both of them are allowed to switch the mutex from unlocked to locked

(C) Only one of them will switch the mutex from unlocked to locked; that thread will be allowed to proceed, the other will wait until the mutex unlocked

(D) Only one of them will switch the mutex from unlocked to locked; that thread will be allowed to proceed, the other will not allowed to proceed

29. Operating system allow processes to share Dynamic-link libraries (DLLs) with :

   (A) read only protection   (B) write only protection

   (C) read and write protection   (D) none of these

30. Middle ware is a :

   (A) Hardware between application programs and operating system

   (B) Hardware between application programs and compiler

   (C) Software between operating system and hardware

   (D) Software between application program and operating system

31. To find whether Deepak is currently on the system (Computer with UNIX operating system) without going over the possibly log listing of user generated by who, which of the following command can be used ?

   (A) who   (B) who cat Deepak

   (C) who I grep Deepak   (D) who Deepak

32. Unix memory allocated to requesting processes using ....

   (A) first fit algorithm

   (B) best fit algorithm

   (C) optimum fit algorithm

   (D) none of the above

33. In SDLC cost/benefit analysis is done in .... phase.

   (A) Design   (B) Coding

   (C) Testing   (D) Maintenance

34. Which of the following steps is *not* executed in White Box Testing ?

   (A) Verify security holes in the code

   (B) Verify the control loops

   (C) Find missing functionality

   (D) Verify the expected output

35. Which of the following is *not* another name of Black Box Testing ?

(A) Functional testing

(B) Behavioural testing

(C) Structural testing

(D) Level testing

36. For a project defect removal efficiency is defined as DRE =

(A) $E/(E + D)$

(B) $D/(E + D)$

(C) $E/(E - D)$

(D) $D(E - D)$

where E is number of errors and D is number of defects found after delivery.

37. Which *one* of the following is *not* a part of object-oriented SE ?

(A) Class diagrams

(B) Object diagrams

(C) Implementing processes

(D) Use case approach for requirement capturing

38. Match the List I with List II and select the *correct* answer by using the codes given below the lists :

	List I		List II
(a)	Multilayer perceptron	(i)	Feature selection
(b)	SOM	(ii)	Classification
(c)	Branch and Bound	(iii)	Feature extraction
(d)	Principal component analysis	(iv)	Clustering

Codes :

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

39. A star schema shows a relationship between a dimension and fact table. Which of the following relationships exists between dimension and fact table ?

(A) Many to one

(B) One to one

(C) One to many

(D) Many to many

40. Multicasting raises design issues in the areas of addressing and ....

(A) domain ownership

(B) unicasting

(C) gateways

(D) routing

41. In a MFC which file contains all standard 'include files' ?

(A) stdafx.cpp

(B) frame.cpp

(C) mainframe.cpp

(D) application.cpp

42. If we are going to create handling WM-BUTTON message handling function then, what is the name of function created by class Wizard ?

(A) On L Button Down (.........)

(B) On Left Button Down (.........)

(C) On Button Down (.........)

(D) None of the above

43. How many extension cords are required to connect 34 lamps to a single electric outlet by using extension cords each of which has four outlets ?

(A) 6   (B) 9

(C) 11   (D) 15

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

(A) 81   (B) 52

(C) 51   (D) 45

45. A Chess player wants to prepare for a championship match by playing some practice games in 77 days. She wants to play at least one game a day but no more than 132 games altogether. It can be shown that no matter how she schedules the games there is a period of consecutive days within which she plays exactly .... games.

   (A) 19

   (B) 21

   (C) 23

   (D) 25

46. Out of 1,00,000 people, 51,500 are female and 48,500 are male. Among the females 9000 are bald and among the males 30,200 are bald. What is the probability of choosing a female with hair or a bald male ?

   (A) 0.090

   (B) 0.817

   (C) 0.727

   (D) 0.425

47. Thirty cars were assembled in a factory. The options available were a radio, an air conditioner and white-wall tires. 15 of these cars have radios, 8 of them have air conditioners and 6 of them have white-wall tires. Also, 3 of them have all three options. At least how many cars do not have any option at all ?

   (A) 7

   (B) 8

   (C) 10

   (D) 11

48. In binary, the sixteen bit two's complement of the hexadecimal number $E39B_{16}$ is ....

   (A) 0001110001101101_2

   (B) 1111001100011001_2

   (C) 0001110001100101_2

   (D) 1111001111010101_2

49. Suppose you have to design a ring counter consisting of five flip-flops. Your ring counter will have ....

   (A) 5 states   (B) 10 states

   (C) 32 states   (D) Infinite states

50. Which of the following is the fastest logic ?

   (A) LSI   (B) TTL

   (C) CMOS   (D) ECL