Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

Answer Sheet No. : .....

(To be filled by the Candidate)

Roll No. | | | | | | | |

(In figures as per admission card)

Roll No. _____

(In words)

Test Booklet No.

J–8705

PAPER–II
COMPUTER SCIENCE AND APPLICATIONS

Time : 1¼ hours] **[Maximum Marks : 100**

Number of Pages in this Booklet : **8** Number of Questions in this Booklet : **50**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
   (ii) **Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the question booklet will be replaced nor any extra time will be given.**
   (iii) After this verification is over, the Serial No. of the booklet should be entered in the Answer-sheets and the Serial No. of Answer Sheet should be entered on this Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.

   Example : (A) (B) ● (D)

   where (C) is the correct response.
5. Your responses to the items are to be indicated in the Answer Sheet given **inside the Paper I booklet only**. If you mark at any place other than in the ovals in the Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the test booklet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the test question booklet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
10. **Use only Blue/Black Ball point pen.**
11. **Use of any calculator or log table etc., is prohibited.**
12. **There is NO negative marking.**

परीक्षार्थियों के लिए निर्देश

1. पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
2. इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं।
3. परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी। पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे जिसकी जाँच आपको अवश्य करनी है :
   (i) प्रश्न-पुस्तिका खोलने के लिए उसके कवर पेज पर लगी कागज की सील को फाड़ लें। खुली हुई या बिना स्टीकर-सील की पुस्तिका स्वीकार न करें।
   (ii) **कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चैक कर लें कि ये पूरे हैं। दोषपूर्ण पुस्तिका जिनमें पृष्ठ / प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें। इसके लिए आपको पाँच मिनट दिये जायेंगे। उसके बाद न तो आपकी प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जायेगा।**
   (iii) इस जाँच के बाद प्रश्न-पुस्तिका की क्रम संख्या उत्तर-पत्रक पर अंकित करें और उत्तर-पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें।
4. प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं। आपको सही उत्तर के दीर्घवृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।

   उदाहरण : (A) (B) ● (D)

   जबकि (C) सही उत्तर है।
5. प्रश्नों के उत्तर **केवल प्रश्न पत्र I के अन्दर दिये गये** उत्तर-पत्रक पर ही अंकित करने हैं। यदि आप उत्तर पत्रक पर दिये गये दीर्घवृत्त के अलावा किसी अन्य स्थान पर उत्तर चिन्हांकित करते है, तो उसका मूल्यांकन नहीं होगा।
6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें।
8. यदि आप उत्तर-पुस्तिका पर अपना नाम या ऐसा कोई भी निशान जिससे आपकी पहचान हो सके, किसी भी भाग पर दर्शाते या अंकित करते हैं तो परीक्षा के लिये अयोग्य घोषित कर दिये जायेंगे।
9. आपको परीक्षा समाप्त होने पर उत्तर-पुस्तिका निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद अपने साथ परीक्षा भवन से बाहर न लेकर जायें।
10. **केवल नीले / काले बाल प्वाईंट पैन का ही इस्तेमाल करें।**
11. **किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।**
12. **गलत उत्तर के लिए अंक नहीं काटे जायेंगे।**

COMPUTER SCIENCE AND APPLICATIONS

PAPER – II

Note : This paper contains **fifty** (50) multiple-choice questions, each question carrying **two** (2) marks. Attempt **all** of them.

1. Which of the following is not true ?

(A) Power of deterministic automata is equivalent to power of non-deterministic automata.

(B) Power of deterministic pushdown automata is equivalent to power of non-deterministic pushdown automata.

(C) Power of deterministic turing machine is equivalent to power of non-deterministic turing machine.

(D) All the above

2. Identify the language which is not context - free.

(A) $L = \{ w\, w^R \mid w \in \{0,1\}^* \}$ (B) $L = \{ a^n\, b^n \mid n \geq 0 \}$

(C) $L = \{ w\, w \mid w \in \{0,1\}^* \}$ (D) $L = \{ a^n\, b^m\, c^m\, d^n \mid n, m \geq 0 \}$

3. The transitive closure of a relation R on set A whose relation matrix $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$ is :

(A) $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$

4. Consider the relation on the set of non-negative integers defined by $x \equiv y$ if and only if :

(A) $x \bmod 3 = 3 \bmod y$ (B) $3 \bmod x \equiv 3 \bmod y$

(C) $x \bmod 3 = y \bmod 3$ (D) None of the above

5. Minimum number of individual shoes to be picked up from a dark room (containing 10 pair of shoes) if we have to get atleast one proper pair :

(A) 2 (B) 20 (C) 11 (D) None of these

6. $(101011)_2 = (53)_b$, then 'b' is equal to :

(A) 4 (B) 8 (C) 10 (D) 16

7. The logic expression $\bar{x}\, y\, \bar{z} + \bar{x}\, y\, z + x\, y\, \bar{z} + x\, y\, z$ reduces to :

(A) $\bar{x}\, z$ (B) $x\, y\, z$ (C) y (D) $y\, z$

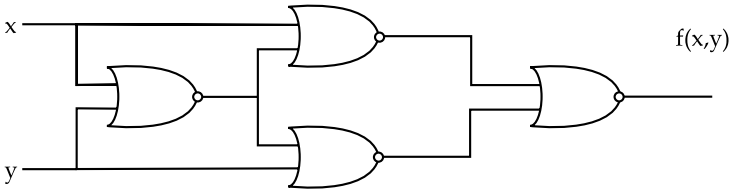
8. Which of the following logic has the maximum fan out ?

(A) RTL (B) ECL (C) N MOS (D) C MOS

9. Which of the following binary number is the same as its 2's complement :

(A) 1010 (B) 0101 (C) 1000 (D) 1001

10. Identify the logic function performed by the circuit shown



(A) Exclusive-OR (B) AND (C) Exclusive-NOR (D) NOR

11. After 3 calls of the c function bug ( ) below, the values of i and j will be :

```
int j = 1;
bug ( )
{ Static int i = 0; int j = 0;
      i++;  j++;
            return (i) ; }
```

(A) i = 0, j = 0 (B) i = 3, j = 3 (C) i = 3, j = 0 (D) i = 3, j = 1

12. Find the output of the following "C" code :

```
Main ( )
{ int  x = 20, y = 35;
      x = y++ + x++;
      y = ++y + ++x;
   printf ("%d, %d\n", x, y);
}
```

(A) 55, 93 (B) 53, 97 (C) 56, 95 (D) 57, 94

13. The data hiding is taken care by :

(A) Abstraction (B) Encapsulation

(C) Modularity (D) Inheritance

14. If a data-item is declared as a protected access specifier then it can be accessed :

(A) Anywhere in the program

(B) By the base and derived classes

(C) Only by base class

(D) Only by derived class

15. Main ( )

```
{ char *str = "abcde";
    printf ("%c", *str);
    printf ("%c", *str++);
    printf ("%c", *(str++));
    printf ("%s", str);}
```

The output of the above 'C' code will be :

(A) a a c b c d e (B) a a c c c d e

(C) a a b c d e (D) None of these

16. An Entity - relationship diagram is a tool to represent :

(A) Data model (B) Process model

(C) Event model (D) Customer model

17. Which of the following tools is not required during system analysis phase of system development Life cycle ?

(A) CASE Tool (B) RAD Tool

(C) Reverse engineering tool (D) None of these

18. A black hole in a DFD is a :

(A) A data store with no in bound flows

(B) A data store with only in bound flows

(C) A data store with more than one in bound flow

(D) None of these.

19. Multi-valued dependency among attribute is checked at which level ?

(A) 2 NF (B) 3 NF (C) 4 NF (D) 5 NF

20. A WINDOW into a portion of a data base is :

(A) Schema (B) View (C) Query (D) Data Dictionary

21. What is the time required to insert an element in a stack with linked implementation ?

(A) $O(\log_2 n)$ (B) $O(n)$ (C) $O(n \log_2 n)$ (D) $O(1)$

22. Which of the following statement is false ?

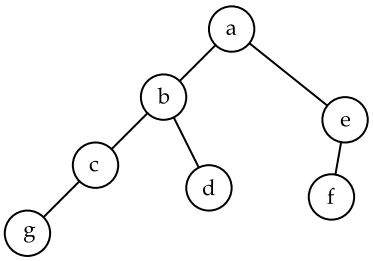
(A) Every tree is a bipertite graph

(B) A tree contains a cycle

(C) A tree with n nodes contains n-1 edges

(D) A tree is a connected graph

23. In the balanced binary tree given below, how many nodes will become unbalanced when a node is inserted as a child of the node "g" ?



(A) 1 (B) 3 (C) 7 (D) 8

24. If the postfix form of a string is ABC + − D*, the actual string is :
(A) (A − (B + C))*D (B) ((A − B) + C)*D
(C) ((A + B) − C)*D (D) (A + (B − C))*D

25. The algorithm that will efficiently sort an array that is nearly sorted except for the interchange of some adjacent pairs of numbers like : { 1, 3, 2, 5, 4, 6} is :
(A) Quick sort (B) Bubble sort
(C) Merge sort (D) Selection sort

26. Which of the following are Data link layer standard ?
(1) Ethernet (2) HSSI (3) Frame Relay
(4) 10-base T (5) Token ring
(A) 1, 2 (B) 1, 3, 5 (C) 1, 3, 4, 5 (D) 1, 2, 3, 4, 5

27. Which type of Bridge would be used to connect an Ethernet Segment with a token ring Segment ?
(A) Transparent Bridge (B) Source-Route Bridge
(C) Translation Bridge (D) None of these

28. Which type of links are used for a connection between two DTE devices ?
(A) X.21 (B) Frame Relay (C) ATM (D) Modem

29. Which protocol is used to encapsulate a data pocket created of a higher OSI model layer ?
(A) HDLC (B) SDLC (C) LAPB (D) LAPD

30. What is the correct subnet mask to use for a class-B address to support 30 Networks and also have the most hosts possible ?
(A) 255·255·255·0 (B) 255·255·192·0
(C) 255·255·240·0 (D) 255·255·248·0

31. Which of the statements related to Compilers is wrong ?
(A) Lexical analysis is breaking the input into tokens
(B) Syntax analysis is for parsing the phrase
(C) Syntax analysis is for analyzing the semantic
(D) None of these

32. Which of the following is the most general phase - structured grammar ?

(A) Regular (B) Context - Sensitive

(C) Context free (D) None of these

33. Which activity is not included in the first pass of two pass assemblers ?

(A) Build the symbol table

(B) Construct the machine code

(C) Separate mnemonic opcode and operand fields.

(D) None of these

34. The dynamic binding occurs during the :

(A) Compile time (B) Run time

(C) Linking time (D) Pre-processing time.

35. Symbol Table can be used for :

(A) Checking type compatibility

(B) Suppressing duplication of error message

(C) Storage allocation

(D) All of these

36. Moving Process from main memory to disk is called :

(A) Caching (B) Termination

(C) Swapping (D) Interruption

37. The principle of Locality of reference justifies the use of :

(A) Virtual memory (B) Interrupts

(C) Cache memory (D) Secondary memory

38. Banker's algorithm is for.

(A) Dead lock Prevention (B) Dead lock Avoidance

(C) Dead lock Detection (D) Dead lock creation

39. Which is the correct definition of a valid process transition in an operating system ?

(A) Wake up : Ready $\rightarrow$ Running

(B) Dispatch : Ready $\rightarrow$ Running

(C) Block : Ready $\rightarrow$ Running

(D) Timer run out : Ready $\rightarrow$ Blocked

40. Which of the following is not an Unix Command ?

(A) Whoami (B) wc (C) ls (D) put

41. The capability maturity model (err) defines 5 levels :

(a)	Level 1	(i)	Managed
(b)	Level 2	(ii)	Defined
(c)	Level 3	(iii)	Repeatable
(d)	Level 4	(iv)	Initial
(e)	Level 5	(v)	Optimized

correct matching is :

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

42. Which one of the following is not a software process model ?

(A) Linear sequential model (B) Prototyping model
(C) The spiral model (D) COCOMO model

43. System Development Life-cycle has following stages :

(I) Requirement analysis (II) Coding
(III) Design (IV) Testing

Which option describes the correct sequence of stages ?

(A) III, I, IV, II (B) II, III, I, IV
(C) I, III, IV, II (D) None of the above

44. Which one is measure of software complexity ?

(A) Number of lines of code (LOC) (B) Number of man years
(C) Number of function points (FP) (D) All of the above

45. Which type of coupling is least preferred ?

(A) Content coupling (B) Data coupling
(C) Control coupling (D) Common coupling

46. PVM and MPI Library functions are implemented on the top of the :

(A) Universal Message Passing (UMS)
(B) Network Interface Driver (NID)
(C) Media Access Control (MAC)
(D) None of these

47. The frequency reuse plan is divided into cell grouping using how many cells, where the number of cells equals N ?

(A) 3 (B) 10 (C) 7 (D) 21

48. Which interim standard describes inter-switching networking ?

(A) IS - 54 (B) IS - 95 (C) DS - 45 (D) ANSI - 41

49. Theoretically, how many 1.25 MHz Carriers are there in a CDMA cell ?

(A) 18 (B) 22 (C) 9 (D) 64

50. Another name of IEEE 802.11a is :

(A) WECA (B) Fast Ethernet (C) Wi-Fi 5 (D) 802·11g

Space For Rough Work