

**Signature and Name of Invigilator**

1. (Signature) \_\_\_\_\_

(Name) \_\_\_\_\_

2. (Signature) \_\_\_\_\_

(Name) \_\_\_\_\_

OMR Sheet No. : .....  
(To be filled by the Candidate)Roll No. 

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

(In figures as per admission card)

Roll No. \_\_\_\_\_

(In words)

**D-8709****Test Booklet No.**

Time : 1 ¼ hours]

**PAPER-II**

[Maximum Marks : 100

**COMPUTER SCIENCE & APPLICATIONS**

Number of Pages in this Booklet : 8

Number of Questions in this Booklet : 50

**Instructions for the Candidates**

- Write your roll number in the space provided on the top of this page.
- This paper consists of fifty multiple-choice type of questions.
- 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 :
  - 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.
  - 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.**
  - After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
- 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 | C | D |
|---|---|---|---|

  
where (C) is the correct response.
- 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.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- 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.
- You have to return the test question booklet and OMR Answer sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- Negative Marking :- For each incorrect answer, 0.5 marks shall be deducted.

**परीक्षार्थियों के लिए निर्देश**

- पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
- इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं ।
- 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 :
  - 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 ।
  - 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 अर्थात् 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 ।
  - इस जाँच के बाद प्रश्न-पुस्तिका की क्रम संख्या OMR पत्रक पर अंकित करें और OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें ।
- 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 | C | D |
|---|---|---|---|

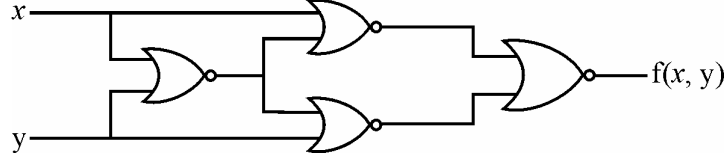
  
जबकि (C) सही उत्तर है ।
- प्रश्नों के उत्तर केवल प्रश्न पत्र I के अन्दर दिये गये उत्तर-पत्रक पर ही अंकित करने हैं । यदि आप उत्तर पत्रक पर दिये गये दीर्घवृत्त के अलावा किसी अन्य स्थान पर उत्तर चिह्नानंकित करते हैं, तो उसका मूल्यांकन नहीं होगा ।
- अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
- कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
- 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 ।
- आपको परीक्षा समाप्त होने पर प्रश्न-पुस्तिका एवं OMR उत्तर-पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें ।
- केवल नीले/काले बाल प्वाइंट पेन का ही इस्तेमाल करें ।
- किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।
- नेगेटिव अंक प्रणाली : प्रत्येक गलत उत्तर के लिए 0.5 अंक काटे जाएँगे ।

**COMPUTER SCIENCE & APPLICATIONS**  
**Paper – II**

**Note :** This paper contains **fifty (50)** objective type questions, each question carrying **two (2)** marks. Attempt **all** the questions.

1. If she is my friend and you are her friend, then we are friends. Given this, the friend relationship in this context is \_\_\_\_\_.  
(i) commutative      (ii) transitive      (iii) implicative      (iv) equivalence  
(A) (i) and (ii)      (B) (iii)  
(C) (i), (ii), (iii) and (iv)      (D) None of these
  
2. Circle has \_\_\_\_\_.  
(A) No vertices      (B) Only 1 vertex  
(C)  $\infty$  vertices      (D) None of these
  
3. If in an error detection and correction code a message M : “You are good students” is stored as M' : Youare areyou aregood goodare goodstudents studentsgood. What is the space required to store M' in general ? (assume that 'n' is the length of M)  
(A) 2n      (B) 3n      (C) 4n      (D) less than 4n
  
4. P : “Program is a step by step execution of the instructions”. Given P, which of the following is true ?  
(A) Program is a subset of an instruction set.  
(B) Program is a sequence of a subset of an instruction set.  
(C) Program is a partially ordered set of an instruction set.  
(D) All of the above
  
5. In a MIU puzzle, either of the letters M, I or U could go as a start symbol. Production rules are given below :  
 $R_1 : U \rightarrow IU$   
 $R_2 : M.x \rightarrow M.x.x$  where '.' is string concatenation operator. Given this, which of the following holds for  
(i) MIUIUIUIUIUI      (ii) MIUIUIUIUIUIUIUIUI  
(A) Either (i) or (ii) but not both of these are valid words.  
(B) Both (i) and (ii) are valid words and they take identical number of transformations for the production.  
(C) Both (i) and (ii) are valid words but they involve different number of transformations in the production.  
(D) None of these
  
6. The simplified form of the Boolean expression  $(X + Y + XY)(X + Z)$  is  
(A)  $X + Y + ZX + Y$       (B)  $XY - YZ$       (C)  $X + YZ$       (D)  $XZ + Y$

7. Identify the logic function performed by the circuit shown



- (A) exclusive OR (B) exclusive NOR  
(C) NAND (D) NOR

8. The highest noise margin is offered by

- (A) BICMOS (B) TTL  
(C) ECL (D) CMOS

9. The answer of the operation  $(10111)_2 * (1110)_2$  in hex equivalence is

- (A) 150 (B) 241 (C) 142 (D) 10101110

10. How many 1's are present in the binary representation of

$$3 \times 512 + 7 \times 64 + 5 \times 8 + 3$$

- (A) 8 (B) 9 (C) 10 (D) 11

11. Recursive functions are executed in a

- (A) First in first out-order (B) Last in first out-order  
(C) Parallel fashion (D) Load balancing

12. What would be the output of the following program, if run from the command line as "myprog 1 2 3" ?

```
main (int argc, char * argv[ ])
{ int i ;
  i = argv[1] + argv[2] + argv[3] ;
  printf ("% d", i) ;
}
```

- (A) 123 (B) 6 (C) Error (D) "123"

13. A \_\_\_\_\_ is a special method used to initialize the instance variable of a class.

- (A) Member function (B) Destructor  
(C) Constructor (D) Structure

14. Encapsulation is

- (A) Dynamic binding  
(B) A mechanism to associate the code and data.  
(C) Data abstraction  
(D) Creating new class

15. Which of the statements are true ?
- I. Function overloading is done at compile time.
  - II. Protected members are accessible to the member of derived class.
  - III. A derived class inherits constructors and destructors.
  - IV. A friend function can be called like a normal function.
  - V. Nested class is a derived class.
- (A) I, II, III                      (B) II, III, V                      (C) III, IV, V                      (D) I, II, IV
16. The E-R model is expressed in term of
- I. Entities
  - II. The relationship among entities.
  - III. The attributes of the entities.
  - IV. Functional relationship.
- (A) I, II                      (B) I, II, IV                      (C) II, II, IV                      (D) I, II, III
17. Specialization is \_\_\_\_\_ process.
- (A) top-down                      (B) bottom up  
(C) both (A) and (B)                      (D) none of these
18. Match the following :
- |                           |  |
|---------------------------|--|
| (1) Determinants          | (a) No attribute can be added  |
| (2) Candidate key         | (b) Uniquely identified a row  |
| (3) Non-redundancy        | (c) A constraint between two attribute   |
| (4) Functional dependency | (d) Group of attributes on the left hand side of arrow of function dependency. |
- (A) 1 – d, 2 – b, 3 – a, 4 – c  
(B) 2 – d, 3 – a, 1 – b, 4 – c  
(C) 4 – a, 3 – b, 2 – c, 1 – d  
(D) 3 – a, 4 – b, 1 – c, 2 – d
19. A function that has no partial functional dependencies is in \_\_\_\_\_ form.
- (A) 3 NF                      (B) 2 NF                      (C) 4 NF                      (D) BCNF
20. Which of the following statement is wrong ?
- I. 2-phase locking protocol suffer from dead lock.
  - II. Time stamp protocol suffer from more aborts.
  - III. A block hole in a DFD is a data store with only inbound flows.
  - IV. Multivalued dependency among attribute is checked at 3 NF level.
  - V. An entity-relationship diagram is a tool to represent event model.
- (A) I, II, II                      (B) II, III, IV                      (C) III, IV, V                      (D) II, IV, V
21. If the number of leaves in a strictly binary tree is an odd number, then what can you say with full conviction about total number of nodes in the tree ?
- (A) It is an odd number.  
(B) It is an even number.  
(C) It cannot be equal to the number of leaves.  
(D) It is always greater than twice the number of leaves.

22. The number of edges in a complete graph of  $n$  vertices is  
 (A)  $n$  (B)  $n(n-1)/2$  (C)  $n(n+1)/2$  (D)  $n^2/2$
23. At a hill station, the parking lot is one long drive way snaking up a hill side. Cars drive in and park right behind the car in front of them, one behind another. A car can't leave until all the cars in front of it have left. Is the parking lot more like  
 (A) An array (B) A stack (C) A queue (D) A linked list
24. With regard to linked list, which of the following statement is false ?  
 (A) An algorithm to search for an element in a singly linked list requires  $O(n)$  operations in the worst case.  
 (B) An algorithm for deleting the first element in a singly linked list requires  $O(n)$  operations in the worst case.  
 (C) An algorithm for finding the maximum value in a circular linked list requires  $O(n)$  operations.  
 (D) An algorithm for deleting the middle node of a circular linked list requires  $O(n)$  operations.
25. A hash function  $f$  defined as  $f(\text{key}) = \text{key} \bmod 7$ , with linear probing used to resolve collisions. Insert the keys 37, 38, 72, 48, 98 and 11 into the table indexed from 0 to 6. What will be the location of 11 ?  
 (A) 3 (B) 4 (C) 5 (D) 6
26. Device on one network can communicate with devices on another network via a  
 (A) Hub/Switch (B) Utility server  
 (C) File server (D) Gateway
27. What is the maximum window size in sliding window protocol used in a computer network ?  
 (A) 4 (B) 8 (C) 15 (D) 16
28. 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, 3 (B) 1, 3, 5 (C) 1, 3, 4, 5 (D) 1, 2, 3, 4, 5
29. In case of Bus/Tree topology signal balancing issue is overcome by  
 (A) Modulation (B) Polling  
 (C) Segmentation (D) Strong transmitter
30. Match the following :  
 (i) Ethernet (a) Deterministic  
 (ii) Token Ring (b) Utilize the full wire speed  
 (iii) Cut-through switch (c) Prevent looping  
 (iv) Spanning tree (d) Checking valid address
- Codes :**  
 (A) i – d, ii – a, iii – b, iv – c (B) i – a, ii – d, iii – b, iv – c  
 (C) i – d, ii – d, iii – c, iv – b (D) i – d, ii – c, iii – b, iv – a

31. In an absolute loading scheme which loader function is accomplished by assembler ?  
 (A) re-allocation (B) allocation (C) linking (D) loading
32. Which of the following grammar is LR (1) ?  
 (A)  $A \rightarrow a A b, A \rightarrow b A b, A \rightarrow a, A \rightarrow b$   
 (B)  $A \rightarrow a A a, A \rightarrow a A b, A \rightarrow c$   
 (C)  $A \rightarrow A + A, A \rightarrow a$   
 (D) Both (A) and (B)
33. A shift-reduce parser carries out the actions specified within braces immediately after reducing with the corresponding rule of the grammar.  
 $S \rightarrow x x W$  [ print "1"]  
 $S \rightarrow y$  [print "2"]  
 $W \rightarrow S_2$  [print "3"], what is the translation of "x x x x y z z" ?  
 (A) 1 1 2 3 1 (B) 1 1 2 3 3 (C) 2 3 1 3 1 (D) 2 3 3 2 1
34. Context-free Grammar (CFG) can be recognized by  
 (A) Finite state automata  
 (B) 2-way linear bounded automata  
 (C) push down automata  
 (D) both (B) and (C)
35. Synthesized attribute can be easily simulated by a  
 (A) LL grammar (B) Ambiguous grammar  
 (C) LR grammar (D) None of the above
36. In the process management Round-robin method is essentially the pre-emptive version of \_\_\_\_\_  
 (A) FILO (B) FIFO  
 (C) SSF (D) Longest time first
37. A page fault  
 (A) is an error specific page.  
 (B) is an access to the page not currently in memory.  
 (C) occur when a page program occur in a page memory.  
 (D) page used in the previous page reference.
38. A semaphore count of negative n means ( $s = -n$ ) that the queue contains \_\_\_\_\_ waiting processes.  
 (A)  $n + 1$  (B) n (C)  $n - 1$  (D) 0
39. A program is located in the smallest available hole in the memory is \_\_\_\_\_  
 (A) best - fit (B) first - bit (C) worst - fit (D) buddy
40. The Unix command used to find out the number of characters in a file is  
 (A) nc (B) wc (C) chcnt (D) lc

41. Software Engineering is a discipline that integrates \_\_\_\_\_ for the development of computer software.  
 (A) Process (B) Methods (C) Tools (D) All
42. Any error whose cause cannot be identified anywhere within the software system is called \_\_\_\_\_  
 (A) Internal error (B) External error  
 (C) Inherent error (D) Logic error
43. Recorded software attributes can be used in the following endeavours :  
 (i) Cost and schedule estimates.  
 (ii) Software product reliability predictions.  
 (iii) Managing the development process.  
 (iv) No where  
**Codes :**  
 (A) (i) (ii) (iv)  
 (B) (ii) (iii) (iv)  
 (C) (i) (ii) (iii)  
 (D) (i) (ii) (iii) (iv)
44. Black Box testing is done  
 (A) to show that s/w is operational at its interfaces i.e. input and output.  
 (B) to examine internal details of code.  
 (C) at client side.  
 (D) none of above.
45. The name of the transaction file shall be provided by the operator and the file that contains the edited transactions ready for execution shall be called  
 (A) Batch. Exe (B) Trans. Exe  
 (C) Opt. Exe (D) Edit.Exe
46. The single stage network is also called  
 (A) one sided network (B) two sided network  
 (C) recirculating network (D) pipeline network
47. Analysis of large database to retrieve information is called  
 (A) OLTP (B) OLAP (C) OLDP (D) OLPP
48. Which technology is sometime referred to as wireless cable ?  
 (A) MMDS (B) ATM (C) LMDS (D) CDMA
49. Another name of IEEE 802.11 a is \_\_\_\_\_  
 (A) Wi-Max (B) Fast Ethernet  
 (C) Wi-Fi (D) 802.11 g
50. The unlicensed National Information Infrastructure band operates at the \_\_\_\_\_ frequency  
 (A) 2.4 GHz (B) 5 GHz (C) 33 MHz (D) 5 MHz

**Space for Rough Work**