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)

J 8 7 1 0

Test Booklet No.

Time : $1\ ^1/_4$ hours] **PAPER-II** [Maximum Marks : **100**

COMPUTER SCIENCE AND APPLICATIONS

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 Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test 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 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.
10. **Use only Blue/Black Ball point pen.**
11. **Use of any calculator or log table etc., is prohibited.**
12. **There is no negative marks for incorrect answers.**

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 OMR पत्रक पर अंकित करें और OMR 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 चिह्नांकित करते हैं, 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 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 ।
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 उत्तरों के लिए कोई अंक काटे नहीं 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. "x^1 is a clone of x" means x^1 is identical to x in terms of the physical attributes namely, height, weight and complexion. Given, height, weight and complexion only form a complete set of attributes for an entity, cloning is an equivalence relation. What is your impression about this statement ?

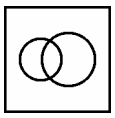
(A) The statement is true

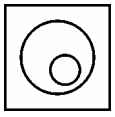
(B) The statement is false

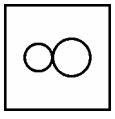
(C) The truth value of the statement cannot be computed

(D) None of these

2. 'R is a robot of M' means R can perform some of the tasks that otherwise M would do and R is unable to do anything else. Which of the following is the most appropriate representation to model this situation ?

(A) 

(B) 

(C) 

(D) None of these

3. "My Lafter Machin (MLM) recognizes the following strings :

(i) a
(ii) aba
(iii) abaabaaba
(iv) abaabaabaabaabaabaabaabaaba

Using this as an information, how would you compare the following regular expressions ?

(i) $(aba)3^x$

(ii) $a.(baa)3^x–1.\ ba$

(iii) $ab.(aab).^{3^x–1}.a$

(A) (ii) and (iii) are same, (i) is different.
(B) (ii) and (iii) are not same.
(C) (i), (ii) and (iii) are different.
(D) (i), (ii) and (iii) are same.

4. S_1 : I teach algorithms and maths.

S_2 : My professor teaches maths, electronics and computer science.

S_3 : I have a student of maths.

S_4 : Algorithm is a part of computer science.

S_5 : Maths students know computer science.

What would be the chromatic number of a graph, vertices of which are the actors/entities that are involved in the sentences S_1 to S_5 and edges-to represent the associations/relationships amongst the entities/actors as expressed in the sentences S_1 to S_5 above ?

(A) 2
(B) 3
(C) 4
(D) None of these

5. Four your ATM debit card, you have a 4-decimal-digit personal secret code. In the absence of any clue, a brute-force attack takes time-'t' to crack the code on an ATM terminal. Therefore 't' is the secure-time for a customer to report in case the card is misplaced. Your Bank has decided to facilitate an increased secure-time. Out of the following, which option should provide the largest rise in the value of 't' ?

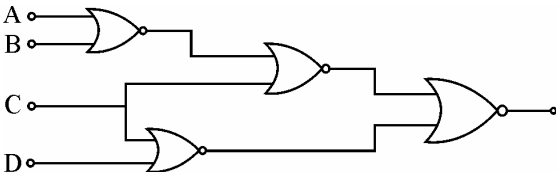
(A) Instead of 4-decimal-digits, maintain the personal secret code in 4-hexadecimal-digits.

(B) Instead of 4-decimal digits, maintain a 5-decimal-digit personal secret code.

(C) Reduce the processing speed of the ATM terminals to the half of their current speed.

(D) None of the above provides any improvement.

6. The logic expression for the output of the circuit shown in the figure is



(A) $\bar{A}\bar{C} + \bar{B}\bar{C} + CD$

(B) $A\bar{C} + B\bar{C} + \bar{C}\bar{D}$

(C) $ABC + \bar{C}\bar{D}$

(D) $\bar{A}\bar{B} + \bar{B}\bar{C} + \bar{C}\bar{D}$

7. Advantage of synchronous sequential circuits over asynchronous ones is

(A) faster operation

(B) ease of avoiding problems due to hazard

(C) lower hardware requirement

(D) better noise immunity

8. What is the transitive voltage for the voltage input of a CMOS operating from 10V supply ?

(A) 1V (B) 2V

(C) 5V (D) 10 V

9. What is decimal equivalent of BCD 11011.1100 ?

(A) 22.0 (B) 22.2

(C) 20.2 (D) 21.2

10. The function represented by the k-map given below is

A \ BC				
	1	0	0	1
	1	0	0	1

(A) $A \cdot B$

(B) $AB + BC + CA$

(C) $\overline{B \oplus C}$

(D) $A \cdot B \cdot C$

11. The statement

print f (" % d", 10 ? 0 ? 5 : 1 : 12);

will print

(A) 10 (B) 0

(C) 12 (D) 1

12. What will be the output of the following c-code ?

```
void main ( )
{
    char *P = "ayqm" ;
    char c;
    c = ++*p ;
    printf ("%c", c);
}
```

(A) a (B) c

(C) b (D) q

13. Member of a class specified as _____ are accessible only to method of the class.

(A) private (B) public

(C) protected (D) derive

14. Match the following :

(a)	Garbage collection in	1.	Java
(b)	Nameless object	2.	generic programming
(c)	Template support	3.	defines a class
(d)	A forward reference	4.	member function
(e)	Derived class inherits from base class	5.	within a statement

Codes :

	(a)	(b)	(c)	(d)	(e)
(A)	1	5	4	2	3
(B)	1	5	2	3	4
(C)	5	1	2	3	4
(D)	5	4	3	1	2

15. The data type created by the data abstraction process is called

(A) class

(B) structure

(C) abstract data type

(D) user defined data type

16. An entity instance is a single occurrence of an _____.

(A) entity type

(B) relationship type

(C) entity and relationship type

(D) None of these

17. Generalization is _____ process.

(A) top-down

(B) bottom up

(C) both (A) & (B)

(D) None of these

18. Match the following :

I.	2 NF	(a)	transitive dependencies eliminated
II.	3 NF	(b)	multivalued attribute removed
III.	4 NF	(c)	contain no partial functional dependencies
IV.	5 NF	(d)	contains no join dependency

Codes :

	I	II	III	IV
(A)	(a)	(c)	(b)	(d)
(B)	(d)	(a)	(b)	(c)
(C)	(c)	(d)	(a)	(b)
(D)	(d)	(b)	(a)	(c)

19. Which data management language component enabled the DBA to define the schema components ?

(A) DML
(B) Sub-schema DLL
(C) Schema DLL
(D) All of these

20. The PROJECT Command will create new table that has

(A) more fields than the original table
(B) more rows than original table
(C) both (A) & (B)
(D) none of these

21. If we have six stack operations-pushing and popping each of A, B and C-such that push (A) must occur before push (B) which must occur before push (C), then A, C, B is a possible order for the pop operations, since this could be our sequence : push (A), pop (A), push (B), push (C), pop (C), pop (B). Which one of the following orders could not be the order the pop operations are run, if we are to satisfy the requirements described above ?

(A) ABC (B) CBA
(C) BAC (D) CAB

22. What is the most appropriate data structure to implement a priority queue ?

(A) Heap
(B) Circular array
(C) Linked list
(D) Binary tree

23. In a complete binary tree of n nodes, how far are the two most distant nodes ? Assume each edge in the path counts as !

(A) About $\log_2 n$
(B) About $2 \log_2 n$
(C) About $n \log_2 n$
(D) About 2n

24. A chained hash table has an array size of 100. What is the maximum number of entries that can be placed in the table ?

(A) 100
(B) 200
(C) 10000
(D) There is no upper limit

25. In a B tree of order 5, the following keys are inserted as follows :

7, 8, 1, 4, 13, 20, 2, 6 and 5

How many elements are present in the root of the tree ?

(A) 1 (B) 2
(C) 3 (D) 4

26. The _____ field is the SNMP PDV reports an error in a response message.

(A) error index
(B) error status
(C) set request
(D) agent index

27. What does the URL need to access documents ?

I. Path name
II. Host name
III. DNS
IV. Retrieval method
V. Server port number

(A) I, II, III (B) I, III, V
(C) I, II, IV (D) III, IV, V

28. End-to-End connectivity is provided from Last-to-Last in

(A) Network layer
(B) Session layer
(C) Transport layer
(D) Data link layer

29. What services does the internet layer provide ?

1. Quality of service
2. Routing
3. Addressing
4. Connection oriented delivery
5. Framing bits

(A) 1, 2, 3 (B) 2, 3, 4
(C) 1, 3, 4, 5 (D) 2, 3, 4, 5

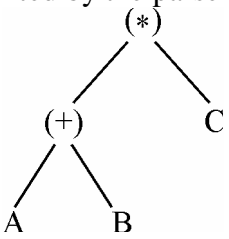
30. What is the maximum operating rate of a wireless LAN using infrared communication ?

(A) 1 mbps (B) 2 mbps
(C) 5 mbps (D) 11mbps

31. In an absolute loading scheme, which loader function is accomplished by a loader ?

(A) Re-allocation
(B) Allocation
(C) Linking
(D) Loading

32. Which of the following expression is represented by the parse tree ?



(A) (A + B) * C (B) A + * BC
(C) A + B * C (D) A * C + B

33. Consider the following left associative operators in decreasing order of precedence :

– subtraction (highest precedence)
* multiplication
$ exponentiation (lowest precedence)

What is the result of the following expression ?

3 – 2 * 4 $ | * 2**3

(A) – 61 (B) 64
(C) 512 (D) 4096

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

(A) Regular
(B) Context-sensitive
(C) Context free
(D) None of the above

35. Which of the following is used for grouping of characters into tokens (in a computer) ?

(A) A parser
(B) Code optimizer
(C) Code generator
(D) Scanner

36. Match the following :

(a)	Disk scheduling	1.	Round-robin
(b)	Batch processing	2.	SCAN
(c)	Time sharing	3.	LIFO
(d)	Interrupt processing	4.	FIFO

Codes :

	(a)	(b)	(c)	(d)
(A)	3	4	2	1
(B)	4	3	2	1
(C)	2	4	1	3
(D)	1	4	3	2

37. _____ synchronizes critical resources to prevent dead lock.

(A) P-operator (B) V-operator
(C) Semaphore (D) Swapping

38. _____ is one of pre-emptive scheduling algorithm.

(A) RR
(B) SSN
(C) SSF
(D) Priority based

39. In order to allow only one process to enter its critical section, binary semaphore are initialized to
(A) 0 (B) 1
(C) 2 (D) 3

40. Remote Computing Service involves the use of time sharing and _____.
(A) multi-processing
(B) interactive processing
(C) batch processing
(D) real-time processing

41. Software engineering primarily aims on
(A) reliable software
(B) cost effective software
(C) reliable and cost effective software
(D) none of the above

42. Top-down design does not require
(A) step-wise refinement
(B) loop invariants
(C) flow charting
(D) modularity

43. Which model is simplest model in Software Development ?
(A) Waterfall model
(B) Prototyping
(C) Iterative
(D) None of these

44. Design phase will usually be
(A) top-down
(B) bottom-up
(C) random
(D) centre fringing

45. Applications-software
(A) is used to control the operating system
(B) includes programs designed to help programmers
(C) performs a specific task for computer users
(D) all of the above

46. The cost of the network is usually determined by
(A) time complexity
(B) switching complexity
(C) circuit complexity
(D) none of these

47. A leased special high-speed connection from the local telephone carrier for business users that transmits at 1.544 mbps is known as _____ carrier.
(A) T_1 (B) T_2
(C) T_3 (D) T_4

48. CDMA Cell uses _____ carriers of 1.25 MHz.
(A) 9 (B) 18
(C) 22 (D) 64

49. At any given time Parallel Virtual Machine (PVM) has _____ send buffer and _____ receive buffer.
(A) one-one (B) one-two
(C) two-two (D) two-one

50. Data Mining uses _____, _____ and _____ to build effective predictive model.
(i) Data set
(ii) Information set
(iii) Input set
(iv) Process set
(v) Output set
(vi) Test set
(A) (i), (ii) and (iv)
(B) (ii), (iv) and (v)
(C) (i), (v) and (vi)
(D) (ii), (iii) and (v)

Space For Rough Works