

PAPER-II
COMPUTER SCIENCE AND APPLICATIONS

Signature and Name of Invigilator

1. (Signature) _____
(Name) _____
2. (Signature) _____
(Name) _____

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

Roll No.

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(In figures as per admission card)

Roll No. _____
(In words)

D 8 7 1 1

Time : 1 ¼ hours]

[Maximum Marks : 100

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 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)
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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, Roll Number, Phone Number or put any mark on any part of the Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, 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.
- There is no negative marks for incorrect answers.

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 चेक 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 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)
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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 नियत स्थान के अलावा अपना नाम, रोल नम्बर, फोन नम्बर या कोई भी ऐसा चिह्न जिससे आपको पहचान हो सके, अंकित करते हैं अथवा अभद्र भाषा का प्रयोग करते हैं, या कोई अन्य अनुचित साधन का प्रयोग करते हैं, तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं ।
- 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 ।
- गलत उत्तरों के लिए कोई अंक काटे नहीं जाएँगे ।

COMPUTER SCIENCE AND APPLICATIONS
Paper – II

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

1. Which of the following data structure is Non-linear type ?
(A) Strings
(B) Lists
(C) Stacks
(D) None of the above
2. The total number of comparisons in a bubble sort is
(A) $O(\log n)$
(B) $O(n \log n)$
(C) $O(n)$
(D) None of the above
3. Which of the following is a bad example of recursion ?
(A) Factorial
(B) Fibonacci numbers
(C) Tower of Hanai
(D) Tree traversal
4. Domain and Range of the function $Y = -\sqrt{-2x + 3}$ is
(A) $x \geq \frac{3}{2}, y \geq 0$ (B) $x > \frac{3}{2}, y \leq 0$
(C) $x \geq \frac{3}{2}, y \leq 0$ (D) $x \leq \frac{3}{2}, y \leq 0$
5. Maximum number of edges in a n-Node undirected graph without self loop is
(A) n^2 (B) $n(n - 1)$
(C) $n(n + 1)$ (D) $\frac{n(n - 1)}{2}$
6. A hash table has space for 75 records, then the probability of collision before the table is 6% full.
(A) .25 (B) .20
(C) .35 (D) .30
7. BCC in the internet refers to
(A) Black carbon copy
(B) Blind carbon copy
(C) Blank carbon copy
(D) Beautiful carbon copy
8. Hub is a term used with
(A) A Star Networks
(B) A Ring Networks
(C) A Router
(D) A Bridge
9. The amount of uncertainty in a system of symbol is called
(A) Bandwidth (B) Entropy
(C) Loss (D) Quantum

10. Which of the following network access standard disassembler is used for connection station to a packet switched network ?
- (A) X.3 (B) X.21
(C) X.25 (D) X.75
11. A station in a network in a network forward incoming packets by placing them on its shortest output queue. What routing algorithm is being used ?
- (A) Hot potato routing
(B) Flooding
(C) Static routing
(D) Delta routing
12. Start and stop bits are used in serial communications for
- (A) Error detection
(B) Error correction
(C) Synchronization
(D) Slowing down the communication
13. For a data entry project for office staff who have never used computers before (user interface and user-friendliness are extremely important), one will use
- (A) Spiral model
(B) Component based model
(C) Prototyping
(D) Waterfall model
14. An SRS
- (A) establishes the basis for agreement between client and the supplier.
(B) provides a reference for validation of the final product.
(C) is a prerequisite to high quality software.
(D) all of the above.
15. McCabe's cyclomatic metric $V(G)$ of a graph G with n vertices, e edges and p connected component is
- (A) e
(B) n
(C) $e - n + p$
(D) $e - n + 2p$
16. Emergency fixes known as patches are result of
- (A) adaptive maintenance
(B) perfective maintenance
(C) corrective maintenance
(D) none of the above
17. Design recovery from source code is done during
- (A) reverse engineering
(B) re-engineering
(C) reuse
(D) all of the above

18. Following is used to demonstrate that the new release of software still performs the old one did by rerunning the old tests :
- (A) Functional testing
 - (B) Path testing
 - (C) Stress testing
 - (D) Regression testing
19. The post order traversal of a binary tree is DEBFCA. Find out the pre-order traversal.
- (A) ABFCDE (B) ADBFEC
 - (C) ABDECF (D) ABDCEF
20. B + tree are preferred to binary tree in database because
- (A) Disk capacities are greater than memory capacities
 - (B) Disk access much slower than memory access
 - (C) Disk data transfer rates are much less than memory data transfer rate
 - (D) Disk are more reliable than memory
21. What deletes the entire file except the file structure ?
- (A) ERASE
 - (B) DELETE
 - (C) ZAP
 - (D) PACK
22. Which command classes text file, which has been created using "SET ALTERNATIVE" <FILE NAME> "Command" ?
- (A) SET ALTERNATE OFF
 - (B) CLOSE DATABASE
 - (C) CLOSE ALTERNATE
 - (D) CLEAR ALL
23. Data security threats include
- (A) privacy invasion
 - (B) hardware failure
 - (C) fraudulent manipulation of data
 - (D) encryption and decryption
24. Which of the following statements is true, when structure of database file with 20 records is modified ?
- (A) ? EOF () Prints. T
 - (B) ? BOF () Prints F
 - (C) ? BOF () Prints T
 - (D) ? EOF () Prints F
25. The SQL Expression
Select distinct T. branch name from branch T, branch S where T. assets > S. assets and S. branch-city = DELHI, finds the name of
- (A) all branches that have greater asset than any branch located in DELHI.
 - (B) all branches that have greater assets than allocated in DELHI.
 - (C) the branch that has the greatest asset in DELHI.
 - (D) any branch that has greater asset than any branch located in DELHI.

26. Dijkstra banking algorithm in an operating system, solves the problem of
- (A) deadlock avoidance
 - (B) deadlock recovery
 - (C) mutual exclusion
 - (D) context switching
27. The multiuser operating system, 20 requests are made to use a particular resource per hour, on an average the probability that no request are made in 45 minutes is
- (A) e^{-15} (B) e^{-5}
 - (C) $1 - e^{-5}$ (D) $1 - e^{-10}$
28. On receiving an interrupt from an I/O device, the CPU
- (A) halts for predetermined time.
 - (B) branches off to the interrupt service routine after completion of the current instruction.
 - (C) branches off to the interrupt service routine immediately.
 - (D) hands over control of address bus and data bus to the interrupting device.
29. The maximum amount of information that is available in one portion of the disk access arm for a removal disk pack (without further movement of the arm with multiple heads)
- (A) a plate of data
 - (B) a cylinder of data
 - (C) a track of data
 - (D) a block of data
30. Consider a logical address space of 8 pages of 1024 words mapped with memory of 32 frames. How many bits are there in the physical address ?
- (A) 9 bits (B) 11 bits
 - (C) 13 bits (D) 15 bits
31. CPU does not perform the operation
- (A) data transfer
 - (B) logic operation
 - (C) arithmetic operation
 - (D) all of the above
32. A chip having 150 gates will be classified as
- (A) SSI (B) MSI
 - (C) LSI (D) VLSI
33. If an integer needs two bytes of storage, then the maximum value of unsigned integer is
- (A) $2^{16} - 1$
 - (B) $2^{15} - 1$
 - (C) 2^{16}
 - (D) 2^{15}
34. Negative numbers cannot be represented in
- (A) signed magnitude form
 - (B) 1's complement form
 - (C) 2's complement form
 - (D) none of the above

35. The cellular frequency reuse factor for the cluster size N is
- (A) N
 (B) N^2
 (C) $\frac{1}{N}$
 (D) $\frac{1}{N^2}$
36. $X - = Y + 1$ means
- (A) $X = X - Y + 1$
 (B) $X = -X - Y - 1$
 (C) $X = -X + Y + 1$
 (D) $= X - Y - 1$
37. Handoff is the mechanism that
- (A) transfer an ongoing call from one base station to another
 (B) initiating a new call
 (C) dropping an ongoing call
 (D) none of above
38. Which one of the following statement is false ?
- (A) Context-free languages are closed under union.
 (B) Context-free languages are closed under concatenation.
 (C) Context-free languages are closed under intersection.
 (D) Context-free languages are closed under Kleene closure.
39. All of the following are examples of real security and privacy risks except
- (A) Hackers
 (B) Spam
 (C) Viruses
 (D) Identify theft
40. Identify the incorrect statement :
- (A) The ATM adoption layer is not service dependent.
 (B) Logical connections in ATM are referred to as virtual channel connections.
 (C) ATM is streamlined protocol with minimal error and flow control capabilities
 (D) ATM is also known as cell delays.
41. Software risk estimation involves following two tasks :
- (A) Risk magnitude and risk impact
 (B) Risk probability and risk impact
 (C) Risk maintenance and risk impact
 (D) Risk development and risk impact
42. The number of bits required for an IP_{V_6} address is
- (A) 16 (B) 32
 (C) 64 (D) 128

43. The proposition $\sim \underline{q} \vee p$ is equivalent to
- (A) $p \rightarrow \underline{q}$ (B) $\underline{q} \rightarrow p$
 (C) $p \leftrightarrow \underline{q}$ (D) $p \vee \underline{q}$
44. Enterprise Resource Planning (ERP)
- (A) has existed for over a decade.
 (B) does not integrate well with the functional areas other than operations.
 (C) is inexpensive to implement.
 (D) automate and integrates the majority of business processes.
45. Which of the following is false concerning Enterprise Resource Planning (ERP) ?
- (A) It attempts to automate and integrate the majority of business processes.
 (B) It shares common data and practices across the enterprise.
 (C) It is inexpensive to implement.
 (D) It provides and access information in a real-time environment.
46. To compare, overlay or cross analyze to maps in GIS
- (A) both maps must be in digital form
 (B) both maps must be at the same equivalent scale.
 (C) both maps must be on the same coordinate system
 (D) All of the above
47. Web Mining is not used in which of the following areas ?
- (A) Information filtering
 (B) Crime fighting on the internet
 (C) Online transaction processing
 (D) Click stream analysis.
48. A telephone conference call is an example of which type of communications ?
- (A) same time / same place
 (B) same time / different place
 (C) different time / different place
 (D) different time / same place
49. What is the probability of choosing correctly an unknown integer between 0 and 9 with 3 chances ?
- (A) $\frac{963}{1000}$
 (B) $\frac{973}{1000}$
 (C) $\frac{983}{1000}$
 (D) $\frac{953}{1000}$
50. The number of nodes in a complete binary tree of height h (with roots at level 0) is equal to
- (A) $2^0 + 2^1 + \dots + 2^h$
 (B) $2^0 + 2^1 + \dots + 2^{h-1}$
 (C) $2^0 + 2^1 + \dots + 2^{h+1}$
 (D) $2^1 + \dots + 2^{h+1}$

Space For Rough Work