

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)

J 8 7 1 1

Time : 1 ¹/₄ 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 आपकी 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. Any integer composed of 3^n identical digits divisible by
(A) 2^n (B) 3^n
(C) 5^n (D) 7^n
2. The circumference of the two concentric disks are divided into 100 sections each. For the outer disk, 100 of the sections are painted red and 100 of the sections are painted blue. For the inner disk, the sections are painted red and blue in an arbitrary manner. It is possible to align the two disks so that
(A) 100 or more
(B) 125 or more
(C) 150 or more
(D) 175 or more
of the sections on the inner disks have their colours matched with the corresponding section on outer disk.
3. The proposition $\sim p \vee q$ is equivalent to
(A) $p \rightarrow q$
(B) $q \rightarrow p$
(C) $p \leftrightarrow q$
(D) $p \vee q$
4. The absorption law in Boolean algebra say that
(A) $X + X = X$
(B) $X \cdot X = X$
(C) $x + x \cdot y = x$
(D) None of the above
5. The number of 1's present in the binary representation of $10 \times 256 + 5 \times 16 + 5$ is
(A) 5 (B) 6
(C) 7 (D) 8
6. The hexadecimal number equivalent to $(1762.46)_8$ is
(A) 3F2.89
(B) 3F2.98
(C) 2F3.89
(D) 2F3.98
7. $(A + B) \overline{AB}$ is equivalent to
(A) $A \oplus B$
(B) $A \odot B$
(C) $(A \oplus B) \odot A$
(D) $(A \odot B) \oplus A$
8. A latch is constructed using two cross-coupled
(A) AND and OR gates
(B) AND gates
(C) NAND and NOR gates
(D) NAND gates

9. A multiplexer is a logic circuit that
- (A) accepts one input and gives several output
 - (B) accepts many inputs and gives many output
 - (C) accepts many inputs and gives one output
 - (D) accepts one input and gives one output
10. 8-bit 1's complement form of -77.25 is
- (A) 01001101.0100
 - (B) 01001101.0010
 - (C) 10110010.1011
 - (D) 10110010.1101
11. From the point of view of the programmer, what are the major advantages of using a high-level language rather than internal machine code or assembly language ?
- (A) Program portability
 - (B) Easy development
 - (C) Efficiency
 - (D) None of the above
12. What features make C++ so powerful ?
- (A) Easy implementation
 - (B) Reusing old code
 - (C) Easy memory management
 - (D) All of the above
13. The goal of operator overloading is
- (A) to help the user of a class
 - (B) to help the developer of a class
 - (C) to help define friend function
 - (D) None of the above
14. The scheme of which interpreter translates the source program is known as
- (A) Paragraph by paragraph
 - (B) Instruction by instruction
 - (C) Line by line
 - (D) None of the above
15. Portable program means
- (A) Program with wheels
 - (B) Independent from its authors
 - (C) Independent of platform
 - (D) None of the above
16. Which of the following is the recovery management technique in DDBMS ?
- (A) 2PC (Two Phase Commit)
 - (B) Backup
 - (C) Immediate update
 - (D) All of the above
17. Which of the following is the process by which a user's privileges ascertained ?
- (A) Authorization
 - (B) Authentication
 - (C) Access Control
 - (D) None of these

18. The basic variants of time-stamp-based method of concurrency control are
- Total time stamp-ordering
 - Partial time stamp ordering
 - Multiversion Time stamp ordering
 - All of the above
19. A transaction can include following basic database access operations :
- Read_item(X)
 - Write_item(X)
 - Both (A) and (B)
 - None of these
20. Decomposition help in eliminating some of the problems of bad design
- Redundancy
 - Inconsistencies
 - Anomalies
 - All of the above
21. The number of different trees with 8 nodes is
- 256
 - 255
 - 248
 - None of these
22. Given a binary tree whose inorder and preorder traversal are given by
 Inorder : EICFBGDJHK
 Preorder : BCEIFDGHJK
 The post order traversal of the above binary tree is
- IEFCGJKHDB
 - IEFCJGKHDB
 - IEFCGKJHDB
 - IEFCGJKDBH
23. The number of disk accesses performed by insertion operation in B-tree of height h is
- $O(1)$
 - $O(1gh)$
 - $O(h)$
 - None of these
24. Consider a hash table of size $m = 10000$ and the hash function $h(k) = \lfloor \frac{m}{A} (kA \bmod 1) \rfloor$ for $A = \frac{(\sqrt{5}-1)}{2}$. The location to the key $k = 123456$ is
- 46
 - 47
 - 41
 - 43
25. When the priority queue is represented by max heap, the insertion and deletion of an element can be performed in (queue containing n elements)
- $\theta(n)$ and $\theta(1)$ respectively
 - $\theta(n)$ and $\theta(n)$ respectively
 - $\theta(1)$ and $\theta(1)$ respectively
 - None of the above
26. A comparison of frequency division and time division multiplexing system shows that
- FDM requires a lower bandwidth, but TDM has greater noise immunity.
 - FDM has greater noise immunity and requires lower bandwidth than TDM.
 - FDM requires channel synchronization, while TDM has greater noise immunity.
 - FDM requires more multiplex while TDM requires band pass filter.

27. If carrier modulated by a digital bit stream, has one of the possible phase of 0, 90, 180 and 270 degrees, then modulation called
- (A) BPSK (B) QPSK
(C) QAM (D) MSK
28. Consider the following statement :
- (i) The bandwidth of the A.M., wave depends on the bandwidth of the modulating signal.
- (ii) The bandwidth of the A.M., wave depends on the modulation index.
- (iii) The bandwidth of the F.M, wave for all practical purpose depends on the amplitude of the carrier.
- Of these statements the correct statements are
- (A) (i, ii)
(B) (i, iii)
(C) (ii, iii)
(D) All of the above
29. A smart modem can dial, hangup and answer incoming calls automatically. Can you tell who provides the appropriate instructions to the modem for this purpose ?
- (A) Communication software
(B) Error detection protocols
(C) Link access procedure (LAP)
(D) Telecommunications
30. Which of the following switching techniques is most suitable for interactive traffic ?
- (A) Circuit switching
(B) Message switching
(C) Packet switching
(D) All of the above
31. Object modules generated by assembler that contains unresolved external references are resolved for two or more object module by a/an
- (A) Operating system
(B) Loader
(C) Linker
(D) Compiler
32. A special software that is used to create a job queue is called
- (A) Drive
(B) Spooler
(C) Interpreter
(D) Linkage editor
33. Which of the following permanent database that has an entry for each terminal symbol ?
- (A) Literal table
(B) Identifier table
(C) Terminal table
(D) Source table

34. In which way(s) a macroprocessor for assembly language can be implemented ?
- (A) Independent two-pass processor
 - (B) Independent one-pass processor
 - (C) Expand macrocalls and substitute arguments
 - (D) All of the above
35. Which of the following can be accessed by transfer vector approach of linking ?
- (A) External data segments
 - (B) External subroutine
 - (C) Data located in other procedure
 - (D) All of the above
36. Block or Buffer caches are used to
- (A) improve disk performance
 - (B) handle interrupts
 - (C) increase the capacity of main memory
 - (D) speed up main memory Read operations
37. A file organization component VSAM file is
- (A) Relative records data set
 - (B) Keyed sequential data set
 - (C) Entry sequential data set
 - (D) All of the above
38. A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as
- (A) Semaphore
 - (B) Mutual exclusion
 - (C) Multiprogramming
 - (D) Message passing
39. How many states can a process be in ?
- (A) 3
 - (B) 4
 - (C) 2
 - (D) 5
40. Which command allows you to view your file 24 lines at a time ?
- (A) More
 - (B) Cat
 - (C) Pg
 - (D) None of the above
41. Which one of the items listed below is not one of the software engineering layers ?
- (A) Process
 - (B) Manufacturing
 - (C) Method
 - (D) Tools

42. What is the first stage in program development ?
- (A) Specification and design
 - (B) System Analysis
 - (C) Testing
 - (D) None of the above
43. By means of a data flow diagram, the analyst can detect
- (A) Task duplication
 - (B) Unnecessary delays
 - (C) Task overlapping
 - (D) All of the above
44. Which of these are the 5 generic software engineering framework activities ?
- (A) Communication, planning, modelling, construction, deployment
 - (B) Communication, risk management, measurement, production, reviewing
 - (C) Analysis, designing, programming, Debugging, maintenance
 - (D) Analysis, planning, designing, programming, testing
45. Many causes of the software crisis can be traced to mythology based on
- (A) Management Myths
 - (B) Customer Myths
 - (C) Practitioner Myths
 - (D) All of the above
46. Data warehousing refers to
- (A) storing data offline at a separate site
 - (B) backing up data regularly
 - (C) is related to data mining
 - (D) uses tape as opposed to disk
47. Virtual memory is
- (A) related to virtual reality
 - (B) a form of ROM
 - (C) a form of RAM
 - (D) None of the above
48. "M-Commerce" refers to
- (A) a myth which does not exist in reality
 - (B) the ability of business to reach potential customers wherever they are
 - (C) the ability to have large capacity of memory storage dealing trade and commerce
 - (D) None of the above
49. The principal electronic payment systems for electronic commerce is
- (A) Credit Card
 - (B) Digital Wallet
 - (C) Electronic Cheque
 - (D) All of the above
50. Which is the most valuable electronic commerce to the individual customer in long run ?
- (A) Business to Customer
 - (B) Business to Business
 - (C) Customer to Customer
 - (D) None of the above

Space For Rough Work

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