Subject Code: **0128/TFU-COMPSC/ELG-II**

Question Booklet No. 550200

परीक्षा केन्द्राध्यक्ष की मोहर
Seal of Superintendent of Examination Centre

C.G.S.E.T-2018
Paper-II
Computer Science and Application

परीक्षार्थी द्वारा बॉल-प्वाइण्ट पेन से भरा जाए
To be filled in by Candidate by Ball-Point pen only

उत्तर-शीट का क्रमांक
Sl. No. of Answer-Sheet

अनुक्रमांक
Roll No.

घोषणा : मैंने नीचे दिये गये निर्देश अच्छी तरह पढ़कर समझ लिए हैं।
Declaration : I have read and understood the instructions given below.

वीक्षक के हस्ताक्षर
(Signature of Invigilator).....

अभ्यर्थी के हस्ताक्षर
(Signature of Candidate).....

वीक्षक के नाम
(Name of Invigilator).....

अभ्यर्थी का नाम
(Name of Candidate).....

Paper : II Subject : **COMPUTER SCIENCE AND APPLICATIONS** Time : 2 Hours Maximum Marks : 200

इस प्रश्न-पुस्तिका में पृष्ठों की संख्या / Number of Pages in this Question Booklet : **24**

इस प्रश्न-पुस्तिका में प्रश्नों की संख्या / Number of Questions in this Question Booklet : **100**

INSTRUCTION TO CANDIDATES

1. Immediately after getting the Booklet read instructions carefully, mentioned on the front and back page of the Question Booklet and do not open the seal given on the right hand side, unless asked by the invigilator. Do not accept a booklet without sticker-seal and do not accept an open booklet. As soon as you are instructed to open the booklet in the first 5 minutes you should compulsorily 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 within 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
2. Write your Roll No., Answer-Sheet No., in the specified places given above and put your signature.
3. Make all entries in the OMR Answer-Sheet as per the given instructions, otherwise Answer-Sheet will not be evaluated.
4. For each question in the Question Booklet choose only one correct/most appropriate answer, out of four options given and darken the circle provided against that option in the OMR Answer-Sheet, bearing the same serial number of the question. Darken the circle with **Black or Blue ball-point pen** only.
5. Darken the circle of chosen option fully, otherwise answers will not be evaluated.

   Example : (A) ● (C) (D) **If (B) is correct answer.**
6. There are **100** objective type questions in this Booklet. All questions are compulsory and carry **2** marks each.
7. Do not write anything anywhere in the Question Booklet or on the Answer-Sheet except making entries in the specified places. Rough work is to be done in the space provided in this booklet.
8. When the examination is over, original OMR Answer Sheet is to be handed over to the invigilator before leaving the examination hall, while the Question Booklet and carbon copy of the Answer-Sheet can be retained by the candidate.
9. There is no negative marks for incorrect answer.
10. Use of any calculator/log table/mobile phone is prohibited.

अभ्यर्थियों के लिए निर्देश

1. प्रश्न-पुस्तिका मिलते ही मुख पृष्ठ एवं अंतिम पृष्ठ में दिए गए निर्देशों को अच्छी तरह पढ़ लें। दाहिनी ओर लगी सील को वीक्षक के कहने से पूर्व न खोलें। स्टीकर सील के बगैर प्रश्न पुस्तिका या खुले हुये प्रश्न पुस्तिका को स्वीकार न करें। प्रश्न पुस्तिका को खोलने के लिए जैसा ही कहा जायेगा प्रथम 5 मिनिट में अनिवार्यत: मुख पृष्ठ पर अंकित पृष्ठों की संख्या एवं प्रश्नों की संख्या को पुस्तिका में पृष्ठों की संख्या एवं प्रश्नों की संख्या से मिलान कर लेवें। पृष्ठों/प्रश्नों का छूटना या पुन: मुद्रित हो जाना या क्रम में नहीं रहना या अन्य किसी विरोधाभास के कारण प्राप्त त्रुटिपूर्ण प्रश्न पुस्तिका को इन्हीं 5 मिनिट के अंदर बदलवा लेवें। इसके पश्चात न ही प्रश्न पुस्तिका बदला जा सकता है और न ही कोई अतिरिक्त समय दिया जायेगा।
2. ऊपर दिए हुए निर्धारित स्थानों में अपना अनुक्रमांक, उत्तर-पुस्तिका का क्रमांक लिखें तथा अपने हस्ताक्षर करें।
3. ओ.एम.आर. उत्तर-शीट में समस्त प्रविष्टियां दिये गये निर्देशानुसार करें अन्यथा उत्तर-शीट का मूल्यांकन नहीं किया जाएगा।
4. प्रत्येक प्रश्न के उत्तर हेतु प्रश्न-पुस्तिका में प्रश्न के नीचे दिए गए चार विकल्पों में से सही/सबसे उपयुक्त केवल एक ही विकल्प का चयन कर ओ.एम.आर. उत्तर-शीट में उसी विकल्प वाले गोले को, जो उस प्रश्न के सरल क्रमांक से सम्बंधित हो, **काले या नीले बॉल-प्वाइण्ट पेन** से भरें।
5. सही उत्तर वाले गोले को अच्छी तरह से भरें, अन्यथा उत्तरों का मूल्यांकन नहीं होगा।

   उदाहरण : (A) ● (C) (D) **यदि (B) उत्तर सही है।**
6. प्रश्न-पुस्तिका में 100 वस्तुनिष्ठ प्रश्न दिए गए हैं। प्रत्येक प्रश्न के लिए 2 अंक निर्धारित है। सभी प्रश्न अनिवार्य है।
7. प्रश्न-पुस्तिका तथा उत्तर-शीट में निर्दिष्ट स्थानों पर प्रविष्टियां भरने के अतिरिक्त कहीं भी कुछ न लिखें। रफ़ कार्य, इस पुस्तिका में उपलब्ध स्थान पर करें।
8. परीक्षा समाप्ति के उपरान्त तथा कक्ष छोड़ने के पूर्व मूल ओ.एम.आर. उत्तर-शीट वीक्षक को सौंपा जाए। प्रश्न-पुस्तिका एवं उत्तर-शीट की कार्बन कॉपी परीक्षार्थी अपने साथ ले जा सकते हैं।
9. ऋणात्मक मूल्यांकन नहीं किया जावेगा।
10. किसी भी तरह के कैलकुलेटर/लॉग टेबल/मोबाइल फोन का प्रयोग वर्जित है।

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

COMPUTER SCIENCE AND APPLICATIONS - II

1. Consider an undirected connected graph. If w is the minimum weight among all edge weights and e is the specific edge of weight w, which of the following statement is **false** ?

   (A) There is a minimum spanning tree containing e.

   (B) If e is not in a minimum spanning tree T, then in the cycle formed by adding e to T, all edges have same weight.

   (C) Every minimum spanning tree has an edge of weight w.

   (D) e is present in every minimum spanning tree.

2. If A is a proper subset of B (i.e. $A \subset B$, but $A \neq B$), we write :

   (A) $A \not\subset B$

   (B) $A \neq B$

   (C) $A \subset B$

   (D) $A \subsetneq B$

3. How many different rearrangements are there for the letters in the word BABAMS if two A's are never adjacent ?

   (A) 24

   (B) 144

   (C) 120

   (D) 180

4. The regular expression $(a+b)^*a(a+b)^*a(a+b)^*$ is representing :

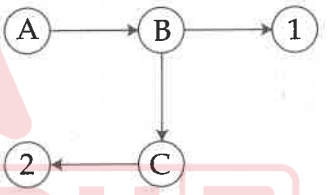
   (A) The set of all strings containing exactly 2a's.

   (B) The set of all strings containing 2a's.

   (C) The set of all strings containing the substring aa.

   (D) The set of all strings containing atmost 2a's.

5. Consider the graph below :



What should be the labels of nodes marked 1 and 2 if the breadth first traversal yields the list A B C D E ?

   (A) D and E respectively

   (B) E and D respectively

   (C) unpredictable

   (D) insufficient information to decide

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

6. Hexadecimal equivalent of $(110011010)_2$ is :

(A) $(19A)_{16}$

(B) $(CD0)_{16}$

(C) $(DC0)_{16}$

(D) $(199)_{16}$

7. A product of sums expression for the function $B\overline{D}+\overline{C}D$ is :

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

(B) $(B+\overline{D})(C+D)$

(C) $(B+D)(\overline{C}+\overline{D})$

(D) $(B+\overline{D})(\overline{C}+D)$

8. Total number of swapping to sort the following list

10, 20, 15, 8, 5, 7

using bubble sort is :

(A) 11

(B) 15

(C) 12

(D) None is correct

9. The scope resolution operator usually _____.

(A) limits the visibility of variables to a certain function

(B) tells about what the base-class that a class is derived

(C) can specify the function for which the object of the derived class should access

(D) resolves ambiguities.

10. What is the output of the following code ?

```
#include<stdio.h>
main()
    {
    int var=5;
    printf("%d", var=++var==6)
    }
```

(A) 12

(B) 6

(C) 1

(D) 0

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

11. What is the output of following code ?

```
#ifndef include<stdio.h>
void main()
        {
        #endif
        printf("%d", 900*90/90);
        }
```

(A) 900

(B) 171

(C) 90

(D) 271

12. What will be printed if following code executed ?

```
#include<stdio.h>
#include<conio.h>
main()
    {
    clrscr()
    printf(.6+, CHATISHGARH)
```

(A) Runtime Error

(B) CHATISHGARH

(C) CHATISH

(D) GARH

13. Suppose a relation is in 3NF. Still the relation may have some data redundancy because there may exist :

(A) Non-trivial functional dependencies involving prime attributes on the right hand side.

(B) Non-trivial functional dependencies involving prime attributes on the left hand side.

(C) Non-trivial functional dependencies involving only prime attributes.

(D) Transitive functional dependencies.

14. A relation R has the attributes A, B, C, D, E and satisfies the following set of FDS :

A → B C

B → D

C D → E

E → A

How many candidate keys are there ?

(A) 1

(B) 2

(C) 3

(D) 4

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

15. Which of the following is **true** ?

(A) A relation in 3NF is also in BCNF

(B) There is no relation between BCNF and 3NF

(C) A relation in BCNF is also in 3NF

(D) A relation in BCNF is in 3NF but not in 2NF

16. Which one of the following is **not** a part of the ACID properties for database transactions ?

(A) Atomicity

(B) Consistency

(C) Isolation

(D) Deadlock free

17. Which of the following is **true** ?

(A) In a B^+ tree data can be processed randomly.

(B) In a B^+ tree data can be processed sequentially.

(C) In a B^+ tree every node differ in height be more than one.

(D) B^+ tree does not have a right child.

18. Which of the following takes O(1) time to find an element in a list ?

(A) Linear search

(B) Binary search

(C) Hashing

(D) Breadth first search

19. In an undirected graph of v vertices and e edges, the sum of the degree of each vertex is equal to :

(A) $2v$

(B) $(2v-1)/2$

(C) 2e

(D) $e^2/2$

20. In a queue, insertions can take place only at the other end called :

(A) front

(B) rear

(C) top

(D) bottom

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

21. Distance Vector Routing is generally preferred over Link State Routing because _____.

(A) Distance vector converges faster than Link state

(B) Distance vector allows multiple routing metrics

(C) Distance vector requires less memory for routing table

(D) Distance vector requires more memory for routing table

22. Packet filter firewall operates on which of the following layers ?

(A) Network and Application Layer

(B) Network and Transport Layer

(C) Transport and Application Layer

(D) Physical and Application Layer

23. The length of port address in TCP/IP is :

(A) 32 bits

(B) 48 bits

(C) 16 bits

(D) 64 bits

24. Forwarding and Routing are two main important functions carried out by which layer ?

(A) Physical

(B) Data link

(C) Network

(D) Application

25. What is the device used in System Software for connecting a number of devices to a controller ?

(A) Daisy Chain

(B) Markov Chain

(C) Deterministic Auto-mata

(D) Directed Acyclic Graph

26. A system program that set up an executable program in main memory ready for execution is :

(A) LEX

(B) SCANNER

(C) Editor

(D) Loader

27. Which of the following is used in nested macro-expansion ?

(A) FIFO rule

(B) LIFO rule

(C) LILO rule

(D) Priority rule

28. The Critical Section :

(A) is created for a specific amount of time by a user.

(B) is used to avoid deadlocks.

(C) is where shared resources are accessed.

(D) is used in multitasking.

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

29. Which is the main unit of UNIX which is responsible for maintaining all the important abstraction of the Operating System including virtual memory and processes ?
(A) Kernel
(B) System Libraries
(C) System Utilities
(D) Daemons

30. The page replacement algorithm which gives the lowest page fault rate is :
(A) LRU
(B) FIFO
(C) Optional Page Replacement
(D) Second chance algorithm

31. Suppose a processor is in Blocked state waiting for some i/o service. When the service is completed, it goes to :
(A) Running state
(B) Suspended state
(C) Ready state
(D) Terminated state

32. In a multi-user OS, 20 requests are made to use a particular resource per hour on average. The Probability of having no request in 45 minutes :
(A) e^{-5}
(B) e^{-15}
(C) $1-e^{-5}$
(D) $1-e^{-10}$

33. "Cyclomatic Complexity" is computer for _____.
(A) To write the Code
(B) To design the Test Code
(C) To find the Classes design
(D) To find the Database design

34. The tools that supports different stages of Software development life cycle are called :
(A) CASE tools
(B) CAM tools
(C) SDLC tools
(D) CARE tools

35. Proponents of agile software development take great pains to emphasize the importance of :
(A) Coding factor
(B) People factor
(C) Analysis factor
(D) Testing factor

36. A Generic process framework for software engineering consist of five framework activities :
(A) Communication, Planning, Modeling, Construction and Deployment
(B) Review, Feedback, Framing, Forming and Design
(C) Coding, Algorithm, Process, Plan, and People
(D) Testing, Persons, Party, Program and Plan

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

37. "Smart City" is evolved from which type of E-commerce ?

(A) Business to Customer E-commerce

(B) Business to Government E-commerce

(C) Customer to Customer E-commerce

(D) Customer to Business E-commerce

38. Which of the following **correctly** defines Data Scrubbing ?

(A) A process to reject data from the data warehouse and to create necessary indexes

(B) A process to load the data in the data warehouse and to create the necessary indexes

(C) A process to upgrade the quality of data after it is moved into a data warehouse

(D) A process to upgrade the quality of data before it is moved into a data warehouse

39. Frame relay is a :

(A) Datagram Network

(B) Virtual Circuit Network

(C) Virtual Private Network

(D) Virtual Control Network

40. A fault simulation testing technique is :

(A) Stress testing

(B) Unit testing

(C) Mutation testing

(D) Robust testing

41. MOV A, 11H is from which type of addressing mode ?

(A) Immediate to register

(B) Register to immediate

(C) Register to memory

(D) Memory to register

42. What is the output of the following program ?

```
MOV A, 05H
MOV B, 07H
SUB 05H
MOV C, A
HLT
```

(A) A = 00H, B = 07H and C = 00H

(B) A = 05H, B = 02H and C = 05H

(C) A = 02H, B = 02H and C = 00H

(D) A = 0CH, B = 00H and C = 0CH

43. Suitable Addressing Modes for program relocation at runtime are :

(A) Absolute addressing and Indirect addressing

(B) Absolute addressing and Base addressing

(C) Base addressing and Relative addressing

(D) Absolute addressing, Base addressing and Indirect addressing

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

44. Zero address instruction format is mainly used in :

(A) Von Neuman architecture
(B) Stack organized architecture
(C) RISC architecture
(D) CISC architecture

45. Microprocessor is :

(A) Complex Asynchronous sequential digital logic circuit
(B) Complex Synchronous sequential digital logic circuit
(C) Complex Combinational digital logic circuit
(D) Complex Combinational Analog logic circuit

46. The most relevant addressing mode to write position independent code is :

(A) direct mode
(B) indirect mode
(C) relative mode
(D) indexed mode

47. Which statements are **correct** related to data partitioning ?

(a) Efficiency
(b) Local optimization
(c) Security
(d) Recovery and uptime
(e) Load Balancing

Code :

(A) (a) and (b)
(B) (a), (b), (c), (d) and (e)
(C) (d) and (e)
(D) (c), (d) and (e)

48. Suppose r(ABC) and s(ACDE). Assume that $a \in Dom(A)$, $b \in Dom(B)$, $c \in Dom(C)$ and $d \in Dom(D)$. Which of the following expressions are legal to carry out ?

(a) $r \cup s$

(b) $\pi_B(r) \cap \pi_B(r)$

(c) $\sigma_{D=d}(r)$

(d) $r \cap s$

Code :

(A) (b)
(B) (a) and (d)
(C) (b) and (c)
(D) None of these

49. Which of the following is **not** true about Audit trail in DBMS ?

(A) It is important for database security
(B) It reduces the performance of Database Management System
(C) It enables DBA to track the use of database resources
(D) It enables users to see only a small part of the database

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

50. Consider the following relational schema :

Sailor (sid : integer, sname : string, rating : integer, age : real)

Reserves (sid : integer, bid : integer, day : date)

Boat (bid : integer, bname : string, color : string)

Write a query to find the sids of all sailors who have reserved red boats but not green.

(A) SELECT sid

FROM Sailors S, Reserves R, Boat B

WHERE sid = R.sid AND R.bid = B.bid AND B.Color = 'green'

EXCEPT

SELECT S_2.Sid

FROM Sailors S_2, Reserves R_2, Boats B_2

S_2.Sid = R_2.Sid AND R_2.bid = B_2.bid AND B_2.Color = 'Red'

(B) SELECT Sid

FROM Sailors S, Reserves R, Boat B

WHERE Sid = R.Sid AND R.bid = B.bid AND B.Color<>'Red'

EXCEPT

SELECT S_2.Sid

FROM Sailors S_2, Reserves R_2, Boats B_2

S_2.Sid = R_2.Sid AND R_2.bid = B_2.bid AND B_2.Color = 'green'

(C) SELECT S.Sid

FROM Sailors S, Reserves R, Boats B

WHERE Sid = R.Sid AND R.bid = B.bid AND B.Color = 'red'

EXCEPT

SELECT S_2.Sid

FROM Sailors S_2, Reserves R_2, Boats B_2

S_2.Sid = R_2.Sid AND R_2.bid = B_2.bid AND B_2.Color = 'green'

(D) SELECT Sid

FROM Sailors S, Reserves R, Boat B

WHERE Sid = R.bid AND R.bid = B.bid AND B.Color = 'green'

EXCEPT

SELECT S_2.Sid

FROM Sailors S_2, Reserves R_2, Boats B_2

S_2.Sid = R_2.Sid AND R_2.bid = B_2.bid AND B_2.Color<>'red'

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

51. Which of the following technique in Computer Graphics is **not** a general transcend interaction technique ?

(A) Resolution Technique

(B) Specific Direction Preference Technique

(C) Specific Positioning Technique

(D) Specific Feedback Technique

52. Consider the employee relation (name, sex, supervisor_name) with name as the primary key. What does the following Tuple relational calculus query produce ?

$\{e.name / employee\ e \wedge \forall\ (x)[7\ employee\ e(x)\ V\ x.supervisor\_name \neq e.name\ V\ x.sex = male]\}$

(A) Name of employees with male supervisor

(B) Name of employees with no immediate female supervisor

(C) Name of employees with no immediate male supervisor

(D) None of the above

53. AVI stands for :

(A) Audio Video Interleaved

(B) Audio Visual Interface

(C) Animation Video Interleaved

(D) Architectural Video Interleaved

54. Which of the following frame type is **not** used by video compression algorithms ?

(A) I frames

(B) P frames

(C) B frames

(D) L frames

55. What is the aspect ratio of 12 in × 16 in display ?

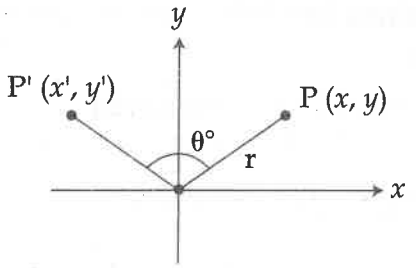
(A) 2 : 3

(B) 3 : 4

(C) 4 : 3

(D) 3 : 2

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

56. 

Refer to the figure. Point P is rotated by θ°. Then value of x' and y' are :

(A) $x' = rx\cos\theta + ry\sin\theta$
$y' = ry\cos\theta - rx\sin\theta$

(B) $x' = r\sin\theta - r\cos\theta$
$y' = r\cos\theta + r\sin\theta$

(C) $x' = x\cos\theta - y\sin\theta$
$y' = x\sin\theta + y\cos\theta$

(D) $x' = \sin\theta + \cos\theta$
$y' = \cos\theta - \sin\theta$

57. Consider the following code given in table for a message U.

U (Input)	Code 1 (C_1)	Code 2 (C_2)	Code 3 (C_3)	Code 4 (C_4)
a	0	0	10	0
b	0	010	00	10
c	1	01	11	110
d	1	10	110	111

Which is the following **true** about the codes ?

(A) C_1 singular, C_2 nonsingular, not uniquely decodable, C_3 uniquely decodable not prefix free, C_4 prefix free trivially decodable

(B) C_1, C_2, C_3, C_4 prefix free decodable

(C) C_1, C_2 singular, C_3, C_4 non-singular

(D) None of the above

58. For a binary symmetric channel with transmission probability $P = 10^{-2}$ the channel capacity is :

(A) 0.919

(B) 0.818

(C) 0.717

(D) 0.617

59. Consider the following macro :

```
Macro    Add X, Y
         Load Y
         Mul X
         Store Y
End      Macro
```

X and Y are :

(A) Identifiers

(B) Variables

(C) Actual parameters

(D) Formal parameters

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60. Which of the following is **not** correct ?

(a) shorts are at least 2 bytes big

(b) longs are at least 3 bytes big

(c) shorts are never bigger than ints

(d) ints are never bigger than longs

Code :

(A) (b) and (c)

(B) (c) and (d)

(C) (b)

(D) (a) and (b)

61. Match the following :

	List-I		**List-II**
(a)	: :	(i)	direct member
(b)	.	(ii)	global scope
(c)	→	(iii)	subscript
(d)	[ ]	(iv)	indirect member
(e)	( )	(v)	type construction

Code :

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

62. Which of the following grammar are LR(0) ?

(a) $S \rightarrow AA$

$A \rightarrow aA$

$A \rightarrow b$

(b) $E \rightarrow T+E \mid T$

$T \rightarrow id$

(c) $S \rightarrow aB$

$A \rightarrow ba$

$A \rightarrow c$

$B \rightarrow Bb$

$B \rightarrow c$

(d) $S \rightarrow AaAb \mid BaBb$

$A \rightarrow \varepsilon$

$B \rightarrow \varepsilon$

Code :

(A) (a) and (b)

(B) (b) and (c)

(C) (b) and (d)

(D) (a) and (c)

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53. Choose the **correct** statements :

(a) Every SLR(1) grammar is LALR(1) but every LALR(1) need not be SLR(1).

(b) CLR(1) parser is more powerfull than other parsers.

(c) Number of entries in LALR(1) parse table is less than equal to entries in CLR(1) parse table.

(d) Every LALR(1) grammar is CLR(1) but every CLR(1) need not be LALR(1).

Code :

(A) (d), (c), (a)

(B) (b), (a), (d)

(C) (a), (b), (c)

(D) All of the above

4. State which of the following in virtual functions is **correct** ?

(A) Virtual function can group objects of different classes so that they can be accessed by the same function code.

(B) Virtual function use the same function call to execute a member function of objects from different classes.

(C) Virtual functions can be used to access a class's private data even though it is not a member function of that class.

(D) Virtual functions can create an array of pointers so that they can hold pointers to derived classes.

65. UDP version with congestion control is :

(A) Datagram congestion control protocol

(B) Stream control transmission protocol

(C) Structured stream transport protocol

(D) None of the above

66. _____ translates internet domain and host names to IP address.

(A) Domain name system

(B) Routing information protocol

(C) Network time protocol

(D) Internet relay protocol

67. Find the Hamming distance between two pairs of words :

(a) d(000, 011)

(b) d(10101, 11110)

Code :

(A) 2 and 3

(B) 3 and 4

(C) 3 and 2

(D) 4 and 3

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68. A slotted ALOHA network transmits 200 bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system produces 1000 frames per second.

(A) 369

(B) 368

(C) 367

(D) 366

69. A file of size 10^6 bits is to be transmitted from node A to node B which are connected by 2 routers and 3 links. Each link length is 100 km and has a speed of 10^8 ms^{-1}.

What will be total transmission time if delay is not zero ?

(A) 3100 seconds

(B) 3003 ms

(C) 3003 seconds

(D) 3100 ms

70. Two computers C_1 and C_2 are configured as :

C_1 : IP - 203.197.2.53/255.255.128.0

C_2 : IP - 203.197.75.201/255.255.192.0

(A) C_1 thinks C_2 on same LAN

(B) C_2 thinks C_1 on same LAN

(C) C_1 and C_2 are both on same LAN

(D) C_1 and C_2 are on different LAN

71. Suppose $T_1(n)$ and $T_2(n)$ are the time complexities of two program fragments P_1 and P_2 where $T_1(n) = O(f(n))$ and $T_2(n) = O(g(n))$.

What is the time complexity of program fragment P_1 followed by P_2 ?

(A) $O(\max(f(n), g(n))$

(B) $O(f(n) \cdot g(n))$

(C) $O(\min(f(n), g(n))$

(D) $O(f(n)/g(n))$

72. In a linked list, the pointer of the last node contains a special value, called the _____ pointer.

(A) NULL

(B) ZERO

(C) LINK

(D) NEXT

73. A complete graph with n vertices has how many Hamiltonian circuits ?

(A) $(n-1)/2$

(B) $(n-1)!$

(C) $n!$

(D) $(n-1)!/2$

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74. A given connected graph is Euler graph iff it is a :

(A) All vertices of the graph are of odd degree

(B) All vertices of the graph are of even degree

(C) Number of vertices are of even degree

(D) Number of vertices are of odd degree

75. The diagram which depicts the flow of task between various components of a system developed using OOAD is :

(A) Class diagram

(B) Activity diagram

(C) Use case diagram

(D) Sequence diagram and implementation diagram

5. A class is defined as a collection of :

(A) Similar objects

(B) Similar objects with shared attributes

(C) Similar objects with shared attributes and behaviours

(D) None of these

77. How to define a pointer to the member of Class ?

```
Class A
  {
      private :
          int m;
      public :
          void show();
  };
```

(A) int A::*ip=&A::m

(B) int A::*ip=&A;

(C) int A*ip=&A;

(D) int A::*ip=A::m;

78. Match the following :

List-I	List-II
(a) Private	(i) Visible to all functions
(b) Protected	(ii) Multiple Inheritance
(c) Public	(iii) Friend of the class
(d) Function	(iv) Visible to member function
(e) Can inherit the attributes of two or more classes	(v) Optional

Code :

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

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79. Let us consider that the size estimated for a software project is 45,000 lines of code. The average salary paid per Engineer is ₹ 40,000 per month. Calculate the cost required if the software is of embedded type.

(A) 1,58,40,000
(B) 1,39,80,000
(C) 1,38,40,000
(D) None of these

80. Consider a payroll software that prints file of employees and a transaction file for each employee for the current month. It updates the employee file and produces an earning report, a reduction report together with analysis of report. The software produces three different types of error messages and is capable of interest command to print on individually requested payslip. It also processes a file containing details of payment to be used in other activities.

Weight table	Simple	Average	Complex
No. of inputs	3	4	6
No. of outputs	4	5	7
No. of inqueries	3	4	6
No. of files	7	10	15
No. of Interfaces	5	7	10

Estimate the unadjusted function point :

(A) 60
(B) 62
(C) 64
(D) 68

81. White box testing is also known as :

(A) Syntax Driven Testing
(B) Functional Testing
(C) Glass Box Testing
(D) Decision Table Based Testing

82. Which of the following is **not** a Validation Method ?

(A) Cause affect Graphs
(B) Boundary Value Analysis
(C) Inspection
(D) Syntax Driven Testing

83. Which of the following functions of I/O device drivers is **incorrect** ?

(A) To optimize the system input output performance
(B) To handle the interrupts that have arrived from the device
(C) To handle the dead lock prevention
(D) To initiate I/O to the particular device through I/O Modules

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84. The initial value of a counting semaphore is 8. If five P operations and three V operations are executed on the semaphore successively, then what will be the final value of the semaphore ?

(A) 10

(B) 0

(C) 8

(D) 6

85. If there are 3 page frames, how many page faults will occur for following page reference string using LRU page replacement algorithm ?

5612636423632126 1561

(A) 12

(B) 14

(C) 09

(D) 15

Working set model is used in memory management to implement the concept of :

(A) Swapping

(B) Principal of locality

(C) Segmentation

(D) Thrashing

87. A* algorithm uses _____ heuristic function to search any goal node.

(A) Admissible function

(B) Evaluation function

(C) Fitness function

(D) Probabilistic function

88. AO* algorithm has another name based upon its functionality :

(A) Admissible Optimal algorithm

(B) Accurate Optimistic algorithm

(C) AND-OR algorithm

(D) AND-AND algorithm

89. In the Applications of EXPERT SYSTEM state which of the following is true ?

(A) PROSPECTOR is the first expert system developed for Medical Personal to diagnose prospective diseases.

(B) PROSPECTOR is an expert system developed for Configuring Components to Complex Computer Systems.

(C) PROSPECTOR is an expert system used for arbirting the geologists to discover mineral deposits.

(D) PROSPECTOR is an expert system used for military personal, guiding the prospective path navigation.

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90. A Horn clause with no positive literal is sometimes called :

(A) indefinite clause

(B) definite clause

(C) goal clause

(D) infinite clause

91. Let W be a string of length n in $\{0, 1\}^*$. Let L be the set of all substrings of W. What is the minimum number of states in a Non-deterministic finite automata that accepts L ?

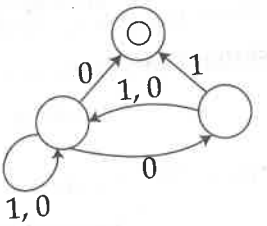
(A) $n - L$

(B) $n + 1$

(C) n

(D) 2^{n-1}

92. Consider the NPA Machine M stated below :



Let the Language accepted by M be L. Let L_1 be the Language accepted by the NFA M_1, obtained by changing the accepted state to M to a non-accepting state and by changing the non-accepting state of M to accepting states. Which of the following is true ?

(A) $L_1 = \{0, 1\}^* - L$

(B) $L_1 = \{0, 1\}^*$

(C) $L_1 \subseteq L$

(D) $L_1 = L$

93. Which of the following optimizatior techniques are typically applied or loops ?

(A) Peephole optimization

(B) Constant folding

(C) Removal of invariant computati

(D) Invariant computation

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94. Match all items in **Group-1** with **correct** options from those given in **Group-2**.

Group-1	Group-2
(a) Regular Expression	(i) Syntax analysis
(b) Pushdown automata	(ii) Code generation
(c) Dataflow analysis	(iii) Lexical analysis
(d) Register allocation	(iv) Code optimization

Code :

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

For solving Non linear programming problems Khun-Tucker conditions are :

(A) Necessary conditions

(B) Sufficient conditions

(C) Necessary and sufficient conditions

(D) Neither necessary nor sufficient conditions

96. Which of the following command is used to move all files to the bin sub-directory of the parent directory ?

(A) mv *.*/bin/

(B) mv */bin/*

(C) mv * ../bin*.*

(D) None of the above

97. What is Fuzzy Approximation Theorem (FAT) ?

(A) Fuzzy set can be used to Model any set

(B) Any smooth function can be approximated by an Fuzzy set with an appropriate structure

(C) All step functions can be approximated by Fuzzy set

(D) Fuzzy set can be approximated by a probability function

98. A three-input neural network has the weights 2, 5 and 3. The transfer function is linear in which proportionality constant is 3. If the input is {4, −1, 2}, what will be the output ?

(A) 25

(B) 29

(C) 27

(D) 21

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99. Using public key cryptography, X adds a digital signature σ to message M, encrypts <M, σ> and sends to Y, where it is decrypted. Which one of the following sequences of keys is used for the operations ?

(A) Encryption :

X's private key followed by Y's private key.

Decryption :

X's public key followed by Y's public key.

(B) Encryption :

X's private key followed by Y's public key.

Decryption :

X's public key followed by Y's private key.

(C) Encryption :

X's public key followed by Y's private key.

Decryption :

Y's public key followed by X's private key.

(D) Encryption :

X's private key followed by Y's public key.

Decryption :

Y's private key followed by X's public key.

100. Given the language L {ab, aa, baa}, which of the following strings satisfy the language ?

(a) abaabaaabaa

(b) aaaabaaaa

(c) baaaaabaaaab

(d) baaaaabaa

Code :

(A) (a), (b) and (d)

(B) (a), (c) and (d)

(C) (b), (c) and (d)

(D) (a), (b), (c) and (d)

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उत्तर अंकित करने का समय : 2 घंटे
Time for marking answers : 2 Hours

अधिकतम अंक : 200
Maximum Marks : 200

नोट :

1. इस प्रश्न-पुस्तिका में 100 प्रश्न है - प्रत्येक प्रश्न 2 अंक का है। सभी प्रश्न हल करना अनिवार्य है।

2. प्रश्नों के उत्तर, दी गई OMR उत्तर-शीट (आंसर-शीट) पर अंकित कीजिए।

3. ऋणात्मक मूल्यांकन नहीं किया जावेगा।

4. किसी भी तरह के कैलकुलेटर या लॉग टेबल एवं मोबाइल फोन का प्रयोग वर्जित है।

5. OMR उत्तर-शीट (आंसर-शीट) का प्रयोग करते समय ऐसी कोई असावधानी न करें/बरतें जिससे यह फट जाये या उसमें मोड़ या सिलवट आदि पड़ जाये जिसके फलस्वरूप वह खराब हो जाये।

SEAL

Note :

1. There are 100 objective type questions in this booket. All questions are compulsory carry two marks each.

2. Indicate your answers on the OMR Answer-Sheet provided.

3. No negative marking will be done.

4. Use of any type of calculator or log table and mobile phone is prohibited.

5. While using OMR Answer-Sheet care should be taken so that the Answer-Sheet does not get torn or spoiled due to folds and wrinkles.

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