

Test Paper : II

Test Subject : COMPUTER SCIENCE AND APPLICATIONS

Test Subject Code : K-2418

Roll No.

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(Figures as per admission card)

OMR Sheet No. : \_\_\_\_\_

TEST BOOKLET SERIAL NO.

**Name & Signature of Invigilator/s**

Signature : \_\_\_\_\_

Name : \_\_\_\_\_

Time : 2 Hours

Maximum Marks : 200

Number of Pages in this Booklet : 16

Number of Questions in this Booklet : 100

**ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು**

- ಈ ಪುಟದ ಮೇಲ್ಭಾಗದಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
- ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ನೂರು (100) ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
- ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ ಪ್ರಶ್ನೆ ಪುಸ್ತಿಕೆಯನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಿಕೆಯನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.
  - ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಗೆ ಪ್ರವೇಶಾವಕಾಶ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ವಿಕ್ಟರ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರೆದ ಪುಸ್ತಿಕೆಯನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
  - ಪುಸ್ತಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳಿ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಲಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಿಕೆಯನ್ನು ಕೂಡಲೆ 5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಿಕೆಗೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.
- ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕವ್ವಾಗಿಸಬೇಕು.

ಉದಾಹರಣೆ :  (A)  (B)  (C)  (D)

(C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
- ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯು ಜೊತೆಯಲ್ಲಿ ಕೊಟ್ಟಿರುವ OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ನಿಮ್ಮ ಉತ್ತರಗಳನ್ನು ಸೂಚಿಸತಕ್ಕದ್ದು. OMR ಹಾಳೆಯಲ್ಲಿ ಅಂಡಾಕೃತಿಯಿಲ್ಲದ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಉತ್ತರವನ್ನು ಗುರುತಿಸಿದರೆ, ಅದರ ಮಾಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
- OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.
- ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಿಕೆಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
- ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗುತ್ತೀರಿ.
- ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMRನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.
- ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
- ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.
- ಕ್ಯಾಲ್ಕುಲೇಟರ್, ವಿದ್ಯುನ್ಮಾನ ಉಪಕರಣ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.
- ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.
- ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳಲ್ಲಿ ಯಾವುದೇ ರೀತಿಯ ವ್ಯತ್ಯಾಸಗಳು ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.

**Instructions for the Candidates**

- Write your roll number in the space provided on the top of this page.
- This paper consists of Hundred 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 the cover page. Do not accept a booklet without sticker seal or 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.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

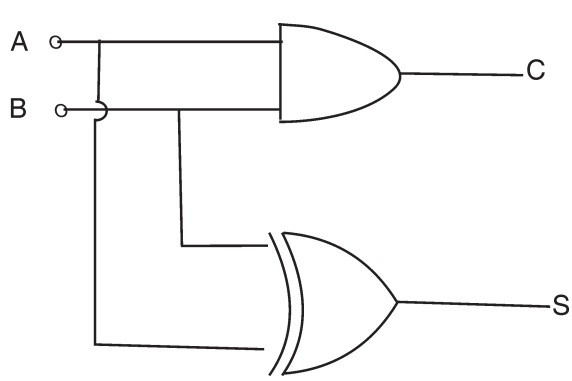
Example :  (A)  (B)  (C)  (D)

where (C) is the correct response.
- Your responses to the questions are to be indicated in the OMR Sheet kept inside this Booklet. If you mark at any place other than in the circles in the OMR Sheet, it will not be evaluated.
- Read the instructions given in OMR 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 OMR Answer Sheet, 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 OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
- You can take away question booklet and carbon copy of OMR Answer Sheet after the examination.
- Use only Blue/Black Ball point pen.
- Use of any calculator, electronic gadgets or log table etc., is prohibited.
- There is no negative marks for incorrect answers.
- In case of any discrepancy found in the Kannada translation of a question booklet the question in English version shall be taken as final.



**COMPUTER SCIENCE AND APPLICATIONS**  
**Paper – II**

**Note :** This paper contains hundred (100) objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. How many 2-digit numbers greater than 40 can be formed by using the digits 1, 2, 3, 4, 6, 7 when repetition is allowed ?  
(A) 12                      (B) 14  
(C) 18                      (D) 22
2. How many subsets of {1, 2, 3, ..., 10} contain at least 7 elements ?  
(A) 89                      (B) 125  
(C) 151                      (D) 176
3. A graph G has 16 edges and all vertices of G are of degree 2. The number of vertices in G is equal to  
(A) 16                      (B) 17  
(C) 18                      (D) 10
4. For a connected planar graph  $G = (V, E)$  having R regions, V vertices and E edges. Then  $V + R - E$  is equal to  
(A) 1                      (B) 2  
(C) 3                      (D) 4
5. An AND gate has 7 inputs. How many input words are in truth table ?  
(A) 64                      (B) 32  
(C) 16                      (D) 128
6. How many flip-flops circuits are needed to divide by 16 ?  
(A) Two                      (B) Four  
(C) Eight                      (D) Sixteen
7. A combinational logic circuit which is used to send data coming from a single source to 2 or more separate destinations is called  
(A) Decoder  
(B) Encoder  
(C) Multiplexer  
(D) Demultiplexer
8. For the circuit shown for  $AB = 00, AB = 01,$  C, S values respectively are  
  
(A) 0, 0 and 0, 1  
(B) 0, 0 and 1, 0  
(C) 0, 1, and 0, 0  
(D) 1, 0 and 0, 0



9. What is the output of the following program ?
- ```
# include < stdio.h >
int main ( )
{
    printf ("%d", 'A' );
    return 0 ;
}
```
- (A) A                      (B) 'A'  
(C) 64                      (D) 65
10. Given the array declaration  
`int myArray [ ] = { 0, 2, 4, 6, 8, 10 }.`  
What is the value of  
`myArray [myArray[2] ] ; ?`
- (A) 0                      (B) 2  
(C) 8                      (D) 6
11. An C++ operator that works in special way on newly defines data type is said to be
- (A) Encapsulated  
(B) Classified  
(C) Polymorphed  
(D) Overloaded
12. Local variables are also called as \_\_\_\_\_ variables.
- (A) Global                      (B) External  
(C) Scope                      (D) Automatic
13. In SQL the word 'natural' can be used with
- (A) Inner join  
(B) Full outer join  
(C) Right outer join  
(D) All of the above
14. In 2NF
- (A) No Functional Dependencies (FDs) exist  
(B) No Multivalued Dependencies (MVDs) exist  
(C) No partial FDs exist  
(D) No partial MVDs exist
15. Relations produced from an E-R model will always be
- (A) First normal form  
(B) Second normal form  
(C) Third normal form  
(D) Fourth normal form
16. In RDBMS, different classes of relations are created using \_\_\_\_\_ technique to prevent modification anomalies.
- (A) Functional Dependencies  
(B) Data Integrity  
(C) Referential Integrity  
(D) Normal Forms
17. A full binary tree with n leave contains
- (A) n nodes  
(B)  $\log_{2n}$  nodes  
(C)  $2n - 1$   
(D)  $2^n$  nodes



18. A machine needs a minimum of 100 sec to sort 1000 names by quick sort the minimum time needed to sort 100 names will be approximately
- (A) 50.2 sec
  - (B) 6.7 sec
  - (C) 72.7 sec
  - (D) 11.2 sec
19. Which of the following is not an inherent application of stack ?
- (A) Reversing a string
  - (B) Evaluation of postfix expression
  - (C) Implementation of recursion
  - (D) Job scheduling
20. The rule for implicit type conversion in C is
- (A) int < unsigned < float < double
  - (B) unsigned < int < float < double
  - (C) int < unsigned < double < float
  - (D) unsigned < int < double < float
21. Which of the following uses UDP as the transport protocol ?
- (A) HTTP
  - (B) Telnet
  - (C) DNS
  - (D) SMTP
22. Gateways can function all way upto
- (A) Transport layer
  - (B) Network layer
  - (C) Presentation layer
  - (D) Application layer
23. A bridge has access to which address of a station on the same network
- (A) Physical
  - (B) Network
  - (C) Service access point
  - (D) All of these
24. How many character per sec (7 bits+1 parity) can be transmitted over a 2400bps line if the transfer is synchronous (1 start and 1 stop bit) ?
- (A) 300
  - (B) 240
  - (C) 250
  - (D) 275
25. In a two-pass assembler the pseudo-code EQU is to be evaluated during
- (A) Pass 1
  - (B) Pass 2
  - (C) Non evaluated by the assembler
  - (D) None of the above
26. A shift reduce parser carries out the actions specified within braces immediately after reducing with the corresponding rule of grammar
- $S \rightarrow XXW \{ \text{Print " 1" } \}$
- $S \rightarrow Y \{ \text{Print " 2" } \}$
- $W \rightarrow SZ \{ \text{Print " 3" } \}$
- What is the translation of XXXXYZ using the syntax directed translation scheme described by the above rules ?
- (A) 23131
  - (B) 11233
  - (C) 11231
  - (D) 33211



27. Which phase of compiler generates stream of atoms ?  
 (A) Syntax Analysis  
 (B) Lexical Analysis  
 (C) Code Generation  
 (D) Code Optimization

28. Which of the following regular expressions, each describing a language of binary numbers (MSB to LSB) that represents non-negative decimal values, does not include even values ?  
 (A)  $0^*1 + 0^*1^*$  (B)  $0^*1^*0+1^*$   
 (C)  $0^*1^*0^*1+$  (D)  $0 + 1^*0^*1^*$

29. Let  $m [0] \dots m [4]$  be mutexes (binary semaphores) and  $P [0] \dots P [4]$  processes. Suppose each process  $P [i]$  executes the following  
 $wait (m [i]); wait (m [(i+1) \text{ mod } 4]);$   
 $release (m [i]) ; release (m [(i+1) \text{ mod } 4]);$   
 This could cause  
 (A) Thrashing  
 (B) Deadlock  
 (C) Starvation, but not deadlock  
 (D) Inversion

30. Match the following :
- |                         |         |
|-------------------------|---------|
| I. The processes ID     | a. grep |
| II. Editor              | b. ps   |
| III. Searching in files | c. cat  |
| IV. Printing a file     | d. vi   |

**Codes :**

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

31. Solid-state disks are  
 (A) Volatile  
 (B) Semiconductor  
 (C) Non-volatile  
 (D) Personal digital assistants

32. Consider the following segment table.

| Segment | Base | Length |
|---------|------|--------|
| 0       | 219  | 600    |
| 1       | 2300 | 14     |
| 2       | 90   | 100    |
| 3       | 1327 | 580    |
| 4       | 1952 | 96     |

What is the physical addresses for the logical address 0, 430 ?

- (A) 2310  
 (B) 649  
 (C) illegal reference  
 (D) 1727
33. Which process model is called as classic life cycle model ?  
 (A) Waterfall model  
 (B) RAD model  
 (C) Prototyping model  
 (D) Incremental model
34. The extent to which a software tolerates the unexpected problems, is termed as  
 (A) Accuracy  
 (B) Reliability  
 (C) Correctness  
 (D) Robustness



35. Cohesion is an extension of  
(A) Abstraction concept  
(B) Refinement concept  
(C) Information hiding concept  
(D) Modularity
36. A software design pattern used to enhance the functionality of an object at run-time is  
(A) Adapter  
(B) Decorator  
(C) Delegation  
(D) Proxy
37. EDI standards are  
(A) not universally available  
(B) essential for B2B commerce  
(C) not required for B2B commerce  
(D) used for ftp
38. The ratio of number of successful calls to the number of call attempts is known as  
(A) Call forwarding rate  
(B) Call completion rate  
(C) Call block rate  
(D) Busy hour call rate
39. Self-organizing maps are an example of  
(A) Supervised learning  
(B) Unsupervised learning  
(C) Self map learning  
(D) Reinforcement learning
40. A goal of data mining is  
(A) To confirm that data exists  
(B) To create a new data for warehouse  
(C) To explain some observed event or condition  
(D) To analyze data for expected relationships
41. The clock signals are used in sequential logic circuits to  
(A) carry serial data signals  
(B) to display time of the day  
(C) tell how much time has elapsed after the system turned on  
(D) coordinate action of digital circuits in various parts of the system
42. The output of a sequential circuit depends on  
(A) present input only  
(B) past inputs only  
(C) present outputs only  
(D) both present and past inputs
43. Which addressing mode execute its instructions within CPU without the necessity of reference memory for operands ?  
(A) Index mode  
(B) Immediate mode  
(C) Register mode  
(D) Direct mode



44. Which circuit implements the hardware priority input unit function to determine the highest priority of simultaneously arriving various input signals ?

- (A) Priority Decoder
- (B) Priority Selector
- (C) Priority Maximizer
- (D) Priority Encoder

45. Every Boyce-Codd Normal Form (BCNF) decomposition is

- (A) Dependency preserving
- (B) Not dependency preserving
- (C) Need to be dependency preserving
- (D) None of these

46. Match the following :

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| a. Secondary index                | 1. Functional dependency        |
| b. Non-procedural Query language  | 2. B-Tree                       |
| c. Closure of a set of attributes | 3. Domain calculus              |
| d. Natural-join                   | 4. Relation algebraic operation |

Codes :

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

47. Consider the following relational schema :  
Supplier (sid : integer, sname : string, city : string , street : string)

Parts (pid : integer, pname : string, color : string )

Catalog (sid : integer, pid : integer, cost : real)

Assume that in the suppliers relation above, each supplier and each street within a city has a unique name and (sname, city) forms a candidate key. No other than those implied by primary and candidate key. Which of the following TRUE about the above schema ?

- (A) The schema is in BCNF
- (B) The schema is in 3NF but not in BCNF
- (C) The schema is in 2NF but not in 3NF
- (D) The schema is not in 2NF

48. Let R (a, b, c) and S (d, e, f) be two relations in which d is the foreign key of S that refers to the primary key of R.

Consider following four operations R and S

- i. insert into R
- ii. insert into S
- iii. delete from R
- iv. delete from S

Which of the following can cause violation of the referential integrity constraint above ?

- (A) Both i and iv
- (B) Both ii and iii
- (C) All of these
- (D) None of these



49. How many K bytes does a frame buffer needs in a  $600 \times 400$  pixel ?
- (A) 27.30 nk bytes  
(B) 19.45 nk bytes  
(C) 29.30 nk bytes  
(D) 25.45 nk bytes
50. An array of values specifying the relative importance of sub-pixel is referred as \_\_\_\_\_ of sub pixel weights.
- (A) Sub-mask  
(B) Mask  
(C) Pixel phasing  
(D) Pixel weighting
51. \_\_\_\_\_ refers to the common elements of graphics scenes, often used in graphics package as primitive components.
- (A) Quadric surfaces  
(B) Wire frame model  
(C) Composite transformation  
(D) Octrees
52. Oblique projection with an angle of 45 degree to the horizontal plane is called as
- (A) Cabinet projection  
(B) Isometric projection  
(C) Cavalier projection  
(D) Isomorphic projection
53. The Running time  $T(n)$ , where  $(n)$  is the input size of a recursive algorithm is given as follows :
- $$T(n) = C + T(n - 1) ; \text{ if } (n > 1)$$
- $$= d, \text{ if } n \leq 1$$
- The order of algorithm is
- (A)  $n^2$                       (B)  $n$   
(C)  $n^3$                       (D)  $n^n$
54. For the 8-bit word 00111001, check bits stored with it would be 0111, suppose when the word is read from memory, the check bits are calculated to be 1101, what is the data word that was read from memory ?
- (A) 10011001  
(B) 00011001  
(C) 00111000  
(D) 11000110
55. For each production in  $P$  of the form :
- $$A \rightarrow X_1, X_2, X_3, \dots, X_n$$
- Put into  $P'$  that production as well as all those generated by replacing null variables with  $e$  in all possible combinations. If all  $X(i)$  are nullable
- (A)  $A \rightarrow e$  is put into  $P'$   
(B)  $e$  is a number of  $G'$   
(C)  $A \rightarrow e$  is not put into  $P'$   
(D) None of the mentioned





56. What does the following command do ?  
grep – vn “abc” X
- (A) It will print line number of file X in which there is a match for the string “abc”
  - (B) It will print all of the lines in the file X that do not match the search string “abc”
  - (C) It will print total number of the lines in X that match the search string “abc”
  - (D) It will print all of the lines in the file X that match the search string “abc”
57. In the slow start phase the TCP congestion control algorithm, the size of congestion window
- (A) Does not increase
  - (B) Increase linearly
  - (C) Increase quadratically
  - (D) Increase exponentially
58. What is the maximum size of data that the application layer can pass on to the TCP layer below ?
- (A) Any size
  - (B)  $2^{16}$  bytes size of TCP header
  - (C) 1500 bytes
  - (D)  $2^{15}$  bytes
59. Match the following :
- |         |                      |
|---------|----------------------|
| P. SMTP | 1. Application layer |
| Q. BGP  | 2. Transport layer   |
| R. TCP  | 3. Data link layer   |
| S. PPP  | 4. Network layer     |
|         | 5. Physical Layer    |
- Codes :**
- (A) P – 2, Q – 1, R – 3, S – 5
  - (B) P – 1, Q – 4, R – 2, S – 3
  - (C) P – 1, Q – 4, R – 2, S – 5
  - (D) P – 2, Q – 4, R – 1, S – 3
60. Suppose transmission rate of a channel is 32 kbps. If there are ‘8’ routes from source to destination and each packet P contains 8000 bits. Total end to end delay in sending packet P is
- (A) 2 sec
  - (B) 3 sec
  - (C) 4 sec
  - (D) 1 sec
61. A text is made up of the characters a, b, c, d, e each occurring with the probability 0.11, 0.40, 0.16, 0.09 and 0.24 respectively. The optimal Huffman coding technique will have the average length of
- (A) 2.40
  - (B) 2.16
  - (C) 2.26
  - (D) 2.15



62. An all-pairs shortest-paths problem is efficiently solved using
- (A) Dijkstra algorithm
  - (B) Bellman-Ford algorithm
  - (C) Kruskal algorithm
  - (D) Floyd-Warshall algorithm
63. Consider a weighted complete graph  $G$  on the vertex set  $\{V_1, V_2, \dots, V_n\}$  such that the weight of the edge  $(V_i, V_j)$  is  $4|i - j|$ . The weight of minimum cost spanning tree of  $G$  is
- (A)  $4n^2$                       (B)  $n$
  - (C)  $4n - 4$                     (D)  $2n - 2$
64. In a binary tree with  $n$  nodes, every node has an odd number of descendants. Every node is considered to be its own descendant. What is the number of nodes in the tree that have exactly one child ?
- (A) 0                              (B) 1
  - (C)  $(n - 1)/2$                   (D)  $n - 1$
65. Let  $y = 0 \times 1ff$  ;  
result =  $y \ll 3$ ;  
The output of result is
- (A) ff 9                          (B) ff 7
  - (C) ff 6                          (D) ff 8
66. \_\_\_\_\_ statement allows an alias to be associated with simple or structured data type.
- (A) union                      (B) class
  - (C) typedef                    (D) atoi
67. `int n ;`  
`n = atoi ("1000") ;`  
What is the value stored in  $n$  ?
- (A) 1                              (B) 10
  - (C) 100                          (D) 1000
68. A member function of a derived class may have the same name as a member function of a base class is known by
- (A) Overloading
  - (B) Overriding
  - (C) Abstraction
  - (D) Virtual
69. According to Brooks, if  $n$  is the number of programmers in a project team then the number of communication path is
- (A)  $n(n - 1)/2$
  - (B)  $n \log n$
  - (C)  $n$
  - (D)  $n(n + 1)/2$
70. The two dimensions of spiral model are
- (A) diagonal, angular
  - (B) radial, perpendicular
  - (C) radial, angular
  - (D) diagonal, perpendicular



71. Match the following with various activities encountered in a software life cycle.

- |                         |                                       |
|-------------------------|---------------------------------------|
| P. Requirements capture | 1. Module development and integration |
| Q. Design               | 2. Domain analysis                    |
| R. Implementation       | 3. Structural and behavioral modeling |
| S. Maintenance          | 4. Performance tuning                 |

**Codes :**

- (A) P – 3, Q – 2, R – 4, S – 1
- (B) P – 2, Q – 3, R – 1, S – 4
- (C) P – 3, Q – 2, R – 1, S – 4
- (D) P – 2, Q – 3, R – 4, S – 1

72. IEEE 830-1993 is a IEEE recommended standard for

- (A) Software requirement specification
- (B) Software design
- (C) Testing
- (D) Maintenance

73. Consider a 4-way set associative cache consisting of 128 lines with a line size of 64 words. The CPU generates a 20-bit address of a word in main memory. The number of bits in the TAG, LINE and WORD fields are respectively.

- (A) 9, 6, 5
- (B) 7, 7, 6
- (C) 7, 5, 8
- (D) 9, 5, 6

74. Consider the methods used by processes  $P_1$  and  $P_2$  for accessing their critical sections whenever needed, as given below. The initial values of shared boolean variables  $S_1$  and  $S_2$  are randomly assigned.

```
method used by  $P_1$ 
while ( $S_1 = S_2$ ) ;
critical section
 $S_1 = S_2$  ;
method used by  $P_2$ 
while ( $S_1 \neq S_2$ );
critical section
 $S_2 = \text{not} (S_1)$  ;
```

Which one of the following statements describes the properties achieved ?

- (A) Mutual exclusion but not progress
- (B) Progress but not mutual exclusion
- (C) Neither mutual exclusion nor progress
- (D) Both mutual exclusion and progress



75. Which of the following features will characterize an OS as multi-programmed OS ?

- a. More than one program may be loaded into main memory at the same time.
- b. If a program waits for certain event another program is immediately scheduled.
- c. If the execution of a program terminates, another program is immediately scheduled.

- (A) (a) only
- (B) (a) and (b) only
- (C) (a) and (c) only
- (D) (a), (b) and (c) only

76. Distributed systems have

- (A) high security
- (B) better resource sharing
- (C) better system utilization
- (D) low system overhead

77. The first widely used commercial form of Artificial Intelligence (AI) is being used in many popular products like microwave ovens, automobiles and plug in circuit boards for desktop PCs. It allows machine to handle vague information with a deftness that mimics human intuition. What is the name of this AI ?

- (A) Boolean logic
- (B) Human logic
- (C) Fuzzy logic
- (D) Functional logic

78. Match the following knowledge representation techniques with their application.

**List – I**

**List – II**

- |                            |                                                                            |
|----------------------------|----------------------------------------------------------------------------|
| a. Frames                  | i. Pictorial representation of objects, their attributes and relationships |
| b. Conceptual dependencies | ii. To describe real world stereotype events                               |
| c. Associative networks    | iii. Record like structures for grouping closely related knowledge         |
| d. Scripts                 | iv. Structures and primitives to represent sentences                       |

**Codes :**

- |     | <b>a</b> | <b>b</b> | <b>c</b> | <b>d</b> |
|-----|----------|----------|----------|----------|
| (A) | iii      | iv       | i        | ii       |
| (B) | iii      | iv       | ii       | i        |
| (C) | iv       | iii      | i        | ii       |
| (D) | iv       | iii      | ii       | i        |



79. In an expert system, the expertise is contained in a
- (A) Data base
  - (B) Model base
  - (C) Knowledge base
  - (D) Content base
80. What is a manager's primary use of a MIS ?
- (A) To facilitate problem solving and decision making
  - (B) To facilitate quality control
  - (C) To monitor inventory
  - (D) To evaluate productivity
81. Let  $w$  be any 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 automaton that accepts  $L$  ?
- (A)  $n - 1$
  - (B)  $n$
  - (C)  $n + 1$
  - (D)  $2n + 1$
82. Which one of the following is FALSE ?
- (A) There is a unique minimal DFA for every regular language
  - (B) Every NFA can be converted to an equivalent PDA
  - (C) Complement of every context-free language is recursive
  - (D) Every non-deterministic PDA can be converted to an equivalent deterministic PDA
83. Which of the following is TRUE for the language ?  
 $\{ a^q \mid q \text{ is a prime} \}$
- (A) It is not accepted by a Turing machine
  - (B) It is context-free but not regular
  - (C) It is regular but not context-free
  - (D) It is neither regular nor context-free, but accepted by a Turing machine
84. The language accepted by a pushdown automaton in which the stack is limited to 8 items is best described as
- (A) Context-free
  - (B) Regular
  - (C) Deterministic context-free
  - (D) Recursive
85. Huffman coding is an encoding algorithm used for
- (A) files greater than 1M bit
  - (B) lossy data compression
  - (C) broadband systems
  - (D) lossless data compression
86. The best visual compression quality is achieved using
- (A) DCT
  - (B) Fourier transform
  - (C) Dolby
  - (D) Wavelets



87. What is the sum of all components of a normalized histogram ?
- (A) 1
  - (B) -1
  - (C) 0
  - (D) None of the above
88. What is the sum of the coefficient of the mark defined using gradient ?
- (A) 1
  - (B) -1
  - (C) 0
  - (D) None of the mentioned
89. The dual simplex method is applicable provided
- (A) Optimality remains satisfied
  - (B) Feasibility remains satisfied
  - (C) Both remain satisfied
  - (D) Optimality is satisfied but feasibility is disturbed
90. In an unweighted, undirected connected graph, the shortest path from a node S to every other node is computed most efficiently in terms of time complexity by
- (A) Dijkstra's algorithm starting from S
  - (B) Warshall's algorithm
  - (C) Performing a DFS starting from S
  - (D) Performing a BFS starting from S
91. The Hungarian method for solving an assignment problem can also be used to solve
- (A) A transportation problem
  - (B) A traveling salesperson problem
  - (C) Both A and B
  - (D) Only B
92. How do find the min-cut ?
- (A) use the residual graph
  - (B) use the spanning tree
  - (C) use the isomorphic graph
  - (D) use the B-tree
93. Back propagation is a learning technique that adjusts weights in the neural network by propagating weight changes
- (A) Forward from source to sink
  - (B) Backward from sink to source
  - (C) Forward from source to hidden nodes
  - (D) Backward from sink to hidden nodes
94. Epoch is a term used to describe in neural network for
- (A) 25% of data in the training set is presented to the neural network
  - (B) 50% of data in the training set is presented to the neural network
  - (C) No data in the training set is presented to the neural network
  - (D) All of the data in the training set is presented to the neural network



95. Perceptron can learn  
(A) AND  
(B) XOR  
(C) Both A and B  
(D) None of these
96. A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. The output will be  
(A) 238  
(B) 76  
(C) 119  
(D) 123
97. \_\_\_\_\_ command is used to terminate a process.  
(A) Shutdown  
(B) Haltsys  
(C) Kill  
(D) Cancel
98. In Shell's interpretive cycle, the shell first scans for \_\_\_\_\_ in the entered commands.  
(A) characters  
(B) priority  
(C) meta-characters  
(D) wild cards
99. The following program  
main ( )  
{  
    if (fork( ) > 0 )  
        sleep(100);  
}
- results in the creation of  
(A) an orphan process  
(B) a zombie process  
(C) a process that executes for ever  
(D) none of the above
100. Match the following WINDOWS system calls and UNIX system calls with reference to process control and file manipulation.
- | Windows                     | UNIX         |
|-----------------------------|--------------|
| a. Create-process ( )       | 1. Open ( )  |
| b. WaitForSingle Object ( ) | 2. Close ( ) |
| c. CreateFile ( )           | 3. Fork ( )  |
| d. CloseHandle ( )          | 4. Wait ( )  |
- Codes :**
- |     | a | b | c | d |
|-----|---|---|---|---|
| (A) | 3 | 4 | 1 | 2 |
| (B) | 4 | 3 | 1 | 2 |
| (C) | 4 | 3 | 2 | 1 |
| (D) | 3 | 4 | 2 | 1 |



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Space for Rough Work