

Test Paper : II

Test Subject : COMPUTER SCIENCE & APPLICATIONS

Test Subject Code : K-2417

Test Booklet Serial No. : _____

OMR Sheet No. : _____

Roll No.

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(Figures as per admission card)

Name & Signature of Invigilator/s

Signature : _____

Name : _____

Paper : II

Subject : COMPUTER SCIENCE & APPLICATIONS

Time : 1 Hour 15 Minutes

Maximum Marks : 100

Number of Pages in this Booklet : 8

Number of Questions in this Booklet : 50

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಈ ಪುಟದ ಮೇಲ್ಭಾಗದಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
2. ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ಐವತ್ತು ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
3. ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ ಪ್ರಶ್ನೆಪುಸ್ತಕವನ್ನು ನಿಮಗೇ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಕವನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರಿಶೀಲಿಸಲು ಕೋರಲಾಗಿದೆ.
(i) ಪ್ರಶ್ನೆ ಪುಸ್ತಕಕ್ಕೆ ಪ್ರವೇಶಾಪಕಾರ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ವಿಚ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರದ ಪುಸ್ತಕವನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
(ii) ಪುಸ್ತಕಿಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ, ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಕವನ್ನು ಕೂಡಲೇ 5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಕಕ್ಕೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ. ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.
4. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕವಚಿಸಬೇಕು.
ಉದಾಹರಣೆ: (A) (B) (C) (D)
(C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
5. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ I ರಲ್ಲಿ ಕೊಟ್ಟಿರುವ OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ II ಮತ್ತು ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ III ರಲ್ಲಿ ಇರುವ ಪ್ರಶ್ನೆಗಳಿಗೆ ನಿಮ್ಮ ಉತ್ತರಗಳನ್ನು ಸೂಚಿಸತಕ್ಕದ್ದು OMR ಹಾಳೆಯಲ್ಲಿ ಅಂಡಾಕೃತಿಯಲ್ಲದೆ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಉತ್ತರವನ್ನು ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
6. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿ.
7. ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಕಿಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
8. ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗುತ್ತೀರಿ.
9. ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರಿಶೀಲಿಸಲು ಕೊಡಲು OMR ನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.
10. ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರಿಶೀಲಿಸಿದ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
11. ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿ.
12. ಕ್ಯಾಲ್ಕುಲೇಟರ್, ವಿದ್ಯುನ್ಮಾನ ಉಪಕರಣ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.
13. ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.
14. ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಗಳಲ್ಲಿ ಯಾವುದೇ ರೀತಿಯ ವ್ಯತ್ಯಾಸಗಳ ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
(i) To have access to the Question Booklet, tear off the paper seal on the edge of the cover page. Do not accept a booklet without sticker seal or open booklet.
(ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
4. 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.
5. Your responses to the questions are to be indicated in the OMR Sheet kept inside the Paper I Booklet only. If you mark at any place other than in the circles in the OMR Sheet, it will not be evaluated.
6. Read the instructions given in OMR carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the test OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
10. You can take away question booklet and carbon copy of OMR Answer Sheet after the examination.
11. Use only Blue/Black Ball point pen.
12. Use of any calculator, Electronic gadgets or log table etc., is prohibited.
13. There is no negative marks for incorrect answers.
14. 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 & APPLICATIONS**
Paper – II

Note : This paper contains **fifty (50)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. ALPHA Company wants to hire 25 programmers to handle system programming job and 40 programmers for application programming of these hired, ten will be expected to perform jobs of both types. How many programmers must be hired ?
(A) 30 (B) 40
(C) 45 (D) 55
2. In a relay race there are five teams A, B, C, D and E. What is the probability that A, B and C are the first three to finish (in any order). Assume that all finishing orders are equally likely
(A) 1/10 (B) 1/20
(C) 1/30 (D) 1/40
3. A graph G has 21 edges, 3 vertices of degree 4 and other vertices of degree 3. Find the Number of vertices in G.
(A) 11 (B) 12
(C) 13 (D) 14
4. Find the hamming distance between X and Y. X = 1100010 Y = 1010001
(A) 3 (B) 4
(C) 5 (D) 6
5. The following context – free grammar generates
 $S \rightarrow TaT$
 $T \rightarrow TT \mid aTb \mid bTa \mid a \mid \epsilon$
(A) The set of string over the alphabet {a, b} with numbers of a's equal to b's
(B) The set of string over the alphabets {a, b} with more a's than b's
(C) The set of string over the alphabet {a, b} with more b's than a's
(D) The set of string over the alphabet {a, b, c} with a, b, c and ϵ
6. From a given tautology, another tautology can be derived by interchanging
(A) 0 and 1
(B) AND and OR
(C) 0 and 1 ; AND and OR
(D) Impossible to derive
7. Negative numbers cannot be represented in
(A) Sign magnitude form
(B) 1's complement form
(C) 2's complement form
(D) None of the above



8. In the IEEE floating point representation, the hexadecimal value 0x00000000 corresponds to

- (A) The normalized value 2^{-127}
- (B) The normalized value 2^{-126}
- (C) The normalized value +0
- (D) The special value +0

9. Consider the following Boolean function of four variables $f(w, x, y, z) = \Sigma (1, 3, 4, 6, 9, 11, 12, 14)$. The function is

- (A) Independent of one variable
- (B) Independent of two variables
- (C) Independent of three variables
- (D) Dependent on all the variables

10. Which of the k map in the figure represents the expression $X = AC + BC + B$?

		\bar{C}	C
\bar{A}	B	1	1
A	B	1	1
A	B	0	0
A	B	0	0

a

		\bar{C}	C
\bar{A}	B	0	1
A	B	0	0
A	B	1	1
A	B	1	1

b

		\bar{C}	C
\bar{A}	B	0	0
A	B	1	1
A	B	1	1
A	B	0	1

c

		\bar{C}	C
\bar{A}	B	1	1
A	B	0	1
A	B	0	1
A	B	1	1

d

- (A) a
- (B) b
- (C) c
- (D) d

11. The operation of a staircase switch best explains the

- (A) OR operation
- (B) AND operation
- (C) Exclusive NOR operation
- (D) Exclusive OR operation

12. In a certain machine, the sum of an integer and its 1's complement is $2^{20} - 1$. Then sizeof(int), in bits, will be

- (A) 16
- (B) 32
- (C) Unpredictable
- (D) None of the above

13. Consider the following segment of C code mention the number of comparison made in the execution of the loop for any $n > 0$ is :

```
int j, n;
j = 1;
while (j <= n)
    j = j * 2;
```

- (A) $\lceil \log_2 n \rceil + 1$
- (B) n
- (C) $\lfloor \log_2 n \rfloor$
- (D) None of the above

14. The function that is actually created from a call to a template function is said to be

- (A) Generated
- (B) Inherited
- (C) Spawned
- (D) Declassified

15. Consider the following C declaration struct {

```
short S [5];
union {
    float y;
    long z;
} u;
}t;
```

Assume that objects of the type short, float and long occupy 2 bytes, 4 bytes and 8 bytes respectively. The memory equipment for variable t, ignoring alignment consideration, is

- (A) 22 bytes
- (B) 14 bytes
- (C) 18 bytes
- (D) 10 bytes



16. Which one of the following is not included in the classical E-R models ?
(A) Entities
(B) Relationships
(C) Integrity Constraints
(D) Attributes
17. Let R be a relation with attributes (A, B, C, D, E, F) and let the following functional dependencies hold
 $A \rightarrow B$
 $A \rightarrow C$
 $CD \rightarrow E$
 $CD \rightarrow F$
 $B \rightarrow E$
Given the above functional dependencies which of the following functional dependencies does not hold ?
(A) $A \rightarrow E$ (B) $CD \rightarrow EF$
(C) $AD \rightarrow F$ (D) $B \rightarrow CD$
18. Consider the table student (Sno, Sname, Cno) where (Sno, Cno) and (Sname, Cname) are the candidates keys of the relation. Which one of the following is not true ?
(A) The above table is in 1NF
(B) The above table is in 2NF
(C) The above table is in 3NF
(D) The above table is in BCNF
19. SQL provides a number of special aggregate functions. Which one of the following is not included in SQL ?
(A) COUNT (B) SUM
(C) MEDIAN (D) MIN
20. Consider the following query
`SELECT student_id FROM enrolment;`
There are 100 students and 500 enrolments although 5 students have not yet enrolled in any course. The number of rows returned by the above query is
(A) 100
(B) 500
(C) 95
(D) Unable to determine
21. In a complete binary tree of n nodes, how far are the most distant nodes ? Assume each in the path count as 1.
(A) About $\log_2(n)$
(B) About $2 \log_2(n)$
(C) About $3 \log_2(n)$
(D) About $4 \log_2(n)$
22. If memory for the run-time stack is only 150 cells (words), how big can N be in Factorial (N) before encountering stack overflow ?
(A) 24 (B) 15
(C) 66 (D) 50
23. A digital search tree is implemented as a tree with n nodes each of which can contain m pointers, corresponding to the m possible symbols in each position of the key. The number of nodes that must be accessed to find a particular key is
(A) m (B) m^n
(C) n (D) $\log m^n$



24. The extra key inserted at the end of the array is called a
- (A) End key
 - (B) Stop key
 - (C) Sentinel
 - (D) Transposition
25. A hash function f defined as $f(\text{key}) = \text{key} \bmod 7$, with linear probing, insert the keys 37, 38, 72, 48, 98, 11, 56, into a table indexed from 11 will be stored in the location
- (A) 3
 - (B) 4
 - (C) 5
 - (D) 6
26. Imagine the length of a 10Base – 5 cable is 100 meters. If the speed of propagation in a thick co-axial cable is 60% of the speed of light, how long does it take for a bit to travel from the beginning to the end of the cable ? Ignore any propagation delay in the equipment. The speed of light = 3×10^8 meters/sec.
- (A) 3.33×10^{-7} sec
 - (B) 4.44×10^{-7} sec
 - (C) 5.55×10^{-7} sec
 - (D) 6.66×10^{-7} sec
27. The _____ is a circuit switched network, while the _____ is a packet switched network.
- (A) Telephone, ATM
 - (B) SONET and FDDI
 - (C) Satellite, Telephone
 - (D) FDDI and SONET
28. Broadband ISDN handles data rate of about
- (A) 64 Kbps
 - (B) 100 Mbps
 - (C) 5.4 Mbps
 - (D) 1.2 Mbps
29. Which command could be used at the command line interface to troubleshoot LAN connectivity problems on a router ?
- (A) tracer
 - (B) ipconfig
 - (C) winipcfg
 - (D) ping
30. Which statement about an IP network is true ?
- (A) A broadcast source MAC contains all zeros
 - (B) A MAC address is part of the physical layer of the OSI model
 - (C) MAC addresses are used by bridges to make forwarding decisions : IP address are used by routers
 - (D) IP address are a flat addressing scheme : MAC addresses use a hierarchical addressing scheme
31. In a two-pass assembler, adding literals to resolution of local table and address resolution of local symbols are done during
- (A) First pass and second pass respectively
 - (B) Second pass
 - (C) Second pass and first pass respectively
 - (D) First pass
32. Privileged instruction can be executed
- (A) Only in monitor mode
 - (B) Only in user mode
 - (C) Both in user and monitor mode
 - (D) None of the above



- 33.** For the following code
MVI A, 1DH
SIM
After the SIM is executed, which are the interrupts that are masked
(A) 6.5, 3.5 (B) 8.5, 6.5
(C) 7.5, 5.5 (D) 4.5, 3.5
- 34.** The string 1101 does not belong to the set represented by
(A) $110^*(0+1)$
(B) $(10)^*(01)^*(00+11)^*$
(C) $1(0+1)^*101$
(D) $1(10+01)^*(1+0)^*$
- 35.** Correctly match the following pairs and determine the answer from the code given below :
- | | |
|-----------------------|-----------------------|
| a. Activation record | 1. Linkage loader |
| b. Location counter | 2. Garbage collection |
| c. Reference counts | 3. Subroutine call |
| d. Address relocation | 4. Assembler |
- (A) a-3, b-4, c-2, d-1
(B) a-4, b-3, c-1, d-2
(C) a-4, b-3, c-2, d-1
(D) a-3, b-4, c-1, d-2
- 36.** Which of the following statements are true ?
1. Shortest remaining time first scheduling may cause starvation.
 2. Preemptive scheduling may cause starvation.
 3. Round robin is better than FCFS in terms of response time.
 4. Thrashing reduces page I/O
- (A) 1 only
(B) 1 and 2 only
(C) 1, 2 and 3 only
(D) All of the above
- 37.** A system uses FIFO policy for page replacement. It has 4 page frames with no pages loaded to begin with. The system first accesses 100 distinct pages in some order and then accesses the same 100 pages but now in reverse order. How many page faults will occur ?
(A) 196 (B) 192
(C) 197 (D) 195
- 38.** Which of the following disk scheduling methods is most likely to lead to starvation for requests on inner or outer cylinders ?
(A) FCFS (B) SSTF
(C) SCAN (D) C-SCAN
- 39.** A process executes the following code
for (i = 0; i < n; i++)
fork();
The total number of child processes created is
(A) n (B) 2^{n-1}
(C) 2^n (D) $2^{n+1} - 1$
- 40.** An attempt to read from a locked file results in
(A) Prematured termination
(B) A deadlock
(C) An indefinite wait
(D) None of the above
- 41.** Design phase include
(A) Data architectural and procedural design only
(B) Architectural, procedural and interface design only
(C) Data, architectural and interface design only
(D) Data, architectural, interface and procedural design only



42. The cyclomatic complexity metric provides the designer with information regarding the number of
- (A) Cycles in the program
 - (B) Errors in the program
 - (C) Independent logic paths in the program
 - (D) Statements in the program
43. PERT and CPM provide quantitative tools that do not allow the software planner to
- (A) Determine the critical path
 - (B) Establish probable time estimates
 - (C) Assemble and deliver time-lines
 - (D) Calculate boundary times for a particular task
44. Coupling is a measure of
- (A) Relative functional strength
 - (B) Interdependence among module
 - (C) Both of the above
 - (D) None of the above
45. If a process is under statistical control, then it is
- (A) Maintainable
 - (B) Measurable
 - (C) Predictable
 - (D) Verifiable
46. _____ is a group of loosely coupled computers that work together closely, so that in some respects they can be regarded as a single computer.
- (A) Distributed computing
 - (B) Cluster computing
 - (C) Massive parallel processing
 - (D) Grid computing
47. _____ of the received radio signals in a mobile communication environment occurs because of multi-path propagation.
- (A) Shading
 - (B) Fading
 - (C) Modulation
 - (D) Demodulation
48. An e-business that allows consumer to name their own price for products and services is following which e-business model ?
- (A) B2B
 - (B) B2G
 - (C) C2C
 - (D) C2B
49. Choose the correct statements
1. In the K-means clustering algorithm, the first row of the distance matrix corresponds to the distance of each object to the first centroid and the second row is the distance of each object to the second centroid.
 2. In the first step of hierarchical clustering algorithm, each cluster generated will have just one item in it.
- (A) Statements 1 and 2 are true
 - (B) Statements 1 and 2 are false
 - (C) Statement 1 is true and 2 is false
 - (D) Statement 1 is false and 2 is true
50. To specify the size of window which of the following syntax is used ?
- (A) sizeof(WNDCLASSEX)
 - (B) sizeof(WNDCLASS)
 - (C) both (A) and (B)
 - (D) neither (A) and (B)



Total Number of Pages : 8

Space for Rough Work