

Test Paper : **III**  
Test Subject : **COMPUTER SCIENCE & APPLICATIONS**  
Test Subject Code : **K-2417**

Test Booklet Serial No. : \_\_\_\_\_

OMR Sheet No. :

Roll No.

(Figures as per admission card)

**Name & Signature of Invigilator/s**

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

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

**Paper : III**

## **Subject : COMPUTER SCIENCE & APPLICATIONS**

Time : 2 Hours 30 Minutes

Maximum Marks : 150

Number of Pages in this Booklet : **16**

Number of Questions in this Booklet : 75

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ఈ పుట్టదమేల్లుదియల్లి ఒదగిసిద్ద స్ఫోదల్లి నిమ్మ రోల్సో నంబర్స్ బరెయిరి.
  2. ఈ ప్రతీకియు బము అంట్యు వ్యధద ఎప్పుక్కెదు ప్రతీకిశ్శన్ను ఒకేగొందిదే.
  3. పొంద్దుయు ఘూరుఖచ్చల్లి ప్రతీప్రతీకియున్న నిమ్మగేనిశ్శలాగుపుదు. ఘోదల్క నిమిషాల్లి నిమ్మ ప్రతీకియున్న తెరెదు మత్తు శేక్కినంత క్షాయిమాగా ప్రాణస్తులు కోరలుగాడి.
  - (i) ప్రత్యే ప్రతీకి ప్రవేశావాత పడేయలు, ఈ మేదిక పుట్టద అంబిన మేలిరుద ప్రాణా సిలెన్సు వరియిరి. స్క్రో సిలో ఇల్లడ అధ్వా తేరె ప్రతీకియున్న శ్లీలుసిచేయడి.
  - (ii) ప్రత్యే కేయల్లిన ప్రశ్నగా సంచే మత్తు పుట్టగా సంచేయున్న ముఖపుట్టద మేలే ముద్దిసి మాఫితియోందిగేతాఁ నోఎరి. పుట్టగాఁ/ప్రత్యేగాను కాజేయాద, అధ్వా ఇద్దుతి అధ్వా అనుకుమవాగిల్లద అధ్వా ఇతర యావుదే ష్టూసు సద దోషప్రారిత ప్రతీకియున్న కొడల్క నిమిషద అధి ఒఁగి, సంవీశక్రింద చరి ఇరువ ప్రతీకిగే బదలాయిసికొళ్ళబేఁకు. ఆ బలిక ప్రత్యే ప్రతీకియున్న బదలాయిసిలాగుపుదిల్లు, యాప్టో హెప్టో స్మెచ్ స్మెచ్ యమస్తు కొడలాగుపుదిల్లు.
  4. ప్రతియోందు ప్రత్యే(A), (B), (C) మత్తు(D) ఎందు గురుతిసిద్దనాల్లు పయాయ ఉత్కరగాళిష, నిమ్మ ప్రత్యే ఎదురు సరియాద ఉత్కరద మీల, శేక్కి కాఁసిదంత అందాక్షితియున్న క్షాగ్నిసచేఁకు.
  - లుదాపరాక్ష:  (A)  (B)  (C)  (D)
  - (C) సరియాద ఉత్కరవాగిద్దగు.
  5. ప్రతీఁగిఁగే ఉత్కరగాఁగున్, ప్రత్తీఁIII ప్రతీఁక్యోలగు కొణియుపా OMR ఉత్కర హాళీయల్లి మాత్తువే సూచిసతక్కుద్దు. OMR హాళీయల్లిన అండాక్షితి హిరమపడి బేఁ యావుదే స్క్షచ్చదల్లి గురుతిసిదచె, అది మాంచులుమాపన మాడలాగుపుదిల్లు.
  6. OMR ఉత్కర హాళీయల్లి కొణి సూచిసగున్న జాగరుకాశియింద ఒదిరి.
  7. ఎల్లు కారడు కేలసమస్తు ప్రతీకియు కొనసయల్లి మాడక్కుద్దు.
  8. నిమ్మ గురుతస్తు ఒపిరంగపడిసిబుమాద నిమ్మ హసరు అధ్వా యావుదే చిహ్నయున్న, సంగతమాద స్థల హిరమపడిసి, OMR ఉత్కర హాళీయ యావుదే భాగిదల్లి ఒరదెరి, నిమ్మ అనహాగే బాధ్యాగిర్థింది.
  9. పరీఁక్యు ముగిదనంతర, క్షాయిమాగి OMR ఉత్కర హాళీయన్న సంవిశ్శక్రిగు నిమ్మ హింతిరిగిసచేఁకు మత్తు పరిఁక్షు కూలిడియ హిరగు OMR స్తు నిమ్మందిగు కొండొయ్యుకొడయ్యు.
  10. పరీఁక్యు సంతర, పరిఁక్షు ప్రత్యే ప్రతీకియున్న మత్తు సెలు OMR ఉత్కర హాళీయన్న నిమ్మందిగు తేగుఁకొందింద మోగుఁచుదు.
  11. నీలి/క్ష్యుబాలోపాయింటా హేనా మాత్తువే ఉపయోగిసిరి.
  12. క్షుల్చుఁఁఁఁరు, విషువ్యాన్న లుపచరిన అధ్వా లాగు టీఁబులు ఇత్తాదియు లుపయోగసమ్మ నిషేధిసలాగాడి.
  13. సర అల్లడ ఉత్కరగాళిగు ముగి అంచ ఇరుపుదిల్లు.
  14. కస్తు మత్తు ఇంగ్రీష్సు ఆప్టికిగు ప్రత్యే ప్రతీకిశ్శల్లి యావుదే రిఁతియ ష్టూగాగాఁ కండుబుందల్లు, ఇంగ్రీష్సు ఆప్టికిగులుయావుదే అంచిమహింద పరిగోసచేఁకు.

## **Instructions for the Candidates**

1. Write your roll number in the space provided on the top of this page.
  2. This paper consists of seventy five 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 question of Paper III are to be indicated in the **OMR Sheet kept inside the Booklet**. If you mark at any place other than in the circles in 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.**

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## COMPUTER SCIENCE & APPLICATIONS

### Paper – III

**Note :** This paper contains **seventy-five (75)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. Which of the following is not a magnetic memory ?  
(A) Core  
(B) Disk  
(C) Flip-flop  
(D) Tape
2. The number of Boolean functions that can be defined for  $n$  Boolean variables over  $k$ -valued Boolean algebra are  
(A)  $2^{2^n}$   
(B)  $K^{kn}$   
(C)  $nk$   
(D)  $n$
3. Non-volatility is an important advantage of  
(A) CCD's  
(B) RAM  
(C) Magnetic bubbles  
(D) PROM
4. How many types of storage loops exist in magnetic bubble memories ?  
(A) 8  
(B) 4  
(C) 3  
(D) 2
5. A Darlington emitter-follower circuit is sometimes used in the output stage of a TTL gate in order to  
(A) Increase its IOL  
(B) Reduces its IOH  
(C) Increase its speed of operation  
(D) Reduce power dissipation
6. Which one of the following is not normally a component of a database security policy ?  
(A) User authentication  
(B) Network monitoring  
(C) Authorization  
(D) Statistical inference control
7. Which one of the following is correct ?  
(A) Dirty page is a page in which maintains a list of pages that have been updated by a transaction that has not been committed  
(B) Pinned page is a page that is not available for flushing  
(C) If a requested page is not in the buffer pool, it needs to replace either an pinned page or a dirty page  
(D) A page replacement policy does not have a significant impact on disk traffic



8. In PL/SQL loop, you need to test if the current FETCH was successful. Which SQL Cursor attribute would you use to accomplish this task ?
- (A) SQL % ISOPEN  
(B) SQL % ROWCOUNT  
(C) SQL % FOUND  
(D) A SQL cursor attribute cannot be used within a PL/SQL loop
9. Which Privilege concerns with system level security ?
- (A) Drop any table  
(B) DELETE  
(C) ALTER  
(D) UPDATE
10. Which table should you query to determine when your procedure was last compiled ?
- (A) USER PROCEDURES  
(B) USER PROCS  
(C) USER OBJECTS  
(D) USER PLSQL UNITS
11. A  $16 \times 16$  array of black and white pixels could be represented by
- (A) 64 bytes  
(B) 32 bytes  
(C) 128 bytes  
(D) 96 bytes
12. Assuming that one allows 256 depth value levels to be used, how much memory would a  $512 \times 512$  pixel display require to store the Z-Buffer ?
- (A) 512 k  
(B) 256 k  
(C) 1024 k  
(D) 128 k
13. The line  $2x - y + 4 = 0$ , if clipped against the window will connect the points
- (A) (0, 1) and (3, 3)  
(B) (0, 1) and (2, 3)  
(C) (1, 2) and (3, 4)  
(D) None of the above



14. Reflection of a point about x-axis, followed by a counter-clockwise rotation of  $90^\circ$ , is equivalent to reflection about the line.

- (A)  $x = -y$
- (B)  $y = -x$
- (C)  $x = y$
- (D)  $x + y = 1$

15. (2, 4) is a point on a circle that has Centre at origin. Which of the following point (s) is/are also on the circle ?

- (A) (2, -4)
- (B) (-2, 4)
- (C) (4, -2)
- (D) All the above

16. An optimizing compiler

- (A) is optimized to occupy less space
- (B) is optimized to take less time for execution
- (C) optimize the code
- (D) none of the above

17. Which of the following grammars are not phase-structured grammars ?

- (A) Regular
- (B) Context-free
- (C) Context-sensitive
- (D) None of the above

18. Regular grammar is also called as type \_\_\_\_\_ grammar.

- (A) type 0
- (B) type 1
- (C) type 2
- (D) type 3

19. Context sensitive grammar can be recognized by

- (A) finite state automata
- (B) 2-way linear bounded automata
- (C) Push down automata
- (D) Both B and C

20.  $(1 + 00^*1) + (1 + 00^*1)(0 + 10^*1)^* (0 + 10^*1)$  is equivalent to

- (A)  $0^*1^* (0 + 10^*1)$
- (B)  $0^*1 (0 + 10^*1)^*$
- (C)  $0^*1^* (0 + 10^*1)^*$
- (D)  $01^* (0 + 10^*1)^*$



**21.** You have an IP address of 172.16.3.57 with an 11-bit subnet mask. What are the valid hosts ?

- (A) 172.16.3.32 to 172.16.3.62
- (B) 172.16.3.33 to 172.16.3.62
- (C) 172.16.3.34 to 172.16.3.62
- (D) 172.16.3.57 to 172.16.3.62

**22.** The two sub layers of the IEEE data link layer are which of the following ?

- (A) Data Link and MAC
- (B) Data Link and LLC
- (C) Logical Link Control and Media Access Control
- (D) Link and Logical Control

**23.** TCP/IP protocols define communication end point, which consists of

- (A) Protocol family and Protocol type
- (B) IP address and Protocol port number
- (C) IP address and Protocol family
- (D) Protocol family and protocol port number

**24.** In connectionless server

- i. There will be a problem of resource depletion
  - ii. Achieving reliability through timeout and retransmission can be very difficult
- (A) Only (i) is true
  - (B) Only (ii) is true
  - (C) Both are true
  - (D) Both are false

**25.** The following is the contents of UDP header is hexadecimal format

AE89000C010D002C

What is the destination port number ?

- (A) 10
- (B) 89
- (C) 20
- (D) 12



26. The minimum number of fields with each node of doubly linked list is

- (A) 1
- (B) 2
- (C) 3
- (D) 4

27. In reverse polish notation, expression  $A * B + C * D$  is written as

- (A)  $AB^*CD^* +$
- (B)  $A^*BCD^* +$
- (C)  $AB^*CD +^*$
- (D)  $A^*B^*CD +$

28. Which of the following sorting algorithms yield approximately the same worst-case and average case running time behavior in  $O(n \log n)$  ?

- (A) Bubble sort and selection sort
- (B) Heap sort and merge sort
- (C) Quick sort and radix sort
- (D) Tree sort and median-of-3-quick sort

29. 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

30.  $F(n) = 1 + n + \log_2 n$ . Time complexity of  $F(n)$  is

- (A)  $O(1)$
- (B)  $O(n)$
- (C)  $O(\log_2 n)$
- (D)  $O(n \log_2 n)$

31. Which of the following is not a wrapper class ?

- (A) Character
- (B) Integer
- (C) Boolean
- (D) String



32. Comments in XML documents is given by

- (A) <?----->.
- (B) </----->
- (C) <!----->
- (D) <!-----!>

33. The values of <servlet-name> and <servlet-class> in web.xml file

- (A) Not possible to predict
- (B) Same
- (C) First value is greater than second
- (D) First value is less than second

34. Runnable is

- (A) Exception handling
- (B) Method
- (C) Interface
- (D) Class

35. Which methods are utilized to control the access to an object in multithread programming ?

- (A) Asynchronized methods
- (B) Synchronized methods
- (C) Syntax methods
- (D) Parallel methods

36. \_\_\_\_\_ model couples the iterative nature of the prototyping with the controlled and systematic aspects of the linear sequential model.

- (A) Spiral
- (B) Rapid Application Development (RAD)
- (C) Iterative Development
- (D) Incremental Development

37. Milestones are used to

- (A) Know the cost of the project
- (B) Know the status of the project
- (C) Know the user expectations
- (D) None of the above



**38.** Which of the following items should not be included in the software project management plan ?

- (A) The techniques and case tools to be used
- (B) Detailed schedules, budgets and resource allocations
- (C) The organisational structure of the development organisation, project responsibilities, managerial objectives and priorities
- (D) None of the above

**39.** To avoid errors in transcription and transposition, during data entry the system analyst should

- (A) Provide for a check digit
- (B) Provide for a hash totals
- (C) Provide batch totals
- (D) All of above

**40.** Given a source code with 10 operators includes 6 unique operators, and 6 operand including 2 unique operands. The program volume is

- (A) 48
- (B) 120
- (C) 720
- (D) Insufficient data

**41.** Relocatable programs

- (A) cannot be used with fixed partitions
- (B) can be loaded almost anywhere in memory
- (C) do not need a linker
- (D) can be loaded only at one specific location

**42.** In real-time operating system, which of following is the most suitable scheduling scheme ?

- (A) Round-robin
- (B) First-come-first-served
- (C) Pre-emptive
- (D) Random scheduling



43. Which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock ?

1. 2-phase locking
  2. Time-stamp ordering
- (A) 1 only  
(B) 2 only  
(C) Both 1 and 2  
(D) Neither 1 nor 2

44. Match the following where Group 1 contains some CPU scheduling algorithms and Group 2 contain some application.

Group 1	Group 2
P. Gang scheduling	1. Guaranteed Scheduling
Q. Rate Monotonic Scheduling	2. Real-time Scheduling
R. Fair share Scheduling	3. Thread Scheduling

(A) P → 3, Q → 2, R → 1  
(B) P → 1, Q → 2, R → 3  
(C) P → 2, Q → 3, R → 1  
(D) P → 1, Q → 3, R → 2

45. Dirty bit for a page in a page table

- (A) helps avoid unnecessary writes on a paging device  
(B) helps maintain LRU information  
(C) allow only read on a page  
(D) none of the above

46. Which search method takes less memory ?

- (A) Depth-First Search  
(B) Breadth-First Search  
(C) Linear Search  
(D) Optimal Search

47. A\* algorithm is based on

- (A) Breadth-First-Search  
(B) Depth-First-Search  
(C) Best-First-Search  
(D) Hill climbing

48. How do you represent “All dogs have tails” ?

- (A)  $\forall x : \text{dog}(x) \rightarrow \text{hasTail}(x)$   
(B)  $\forall x : \text{dog}(x) \rightarrow \text{hasTail}(y)$   
(C)  $\forall x : \text{dog}(x) \rightarrow \text{has} \rightarrow \text{tail}(x)$   
(D)  $\forall x : \text{dog}(x) \rightarrow \text{has} \rightarrow \text{tail}(y)$



49. Which is true for Decision theory ?

- (A) Decision Theory = Probability theory + Utility theory
- (B) Decision Theory = Inference theory + Utility theory
- (C) Decision Theory = Uncertainty + Utility theory
- (D) Decision Theory = Probability theory + Preference

50. Inductive learning involves finding a

- (A) Consistent Hypothesis
- (B) Inconsistent Hypothesis
- (C) Regular Hypothesis
- (D) Irregular Hypothesis

51. Consider the production grammar

$$S \rightarrow AB \mid AS$$

$$A \rightarrow a \mid aA$$

$$B \rightarrow b$$

Which of the following regular expressions corresponding to the production grammar ?

- (A)  $(ab)^*$
- (B)  $a(ab)^*b$
- (C)  $aa^*b^*$
- (D)  $aa^*b$

52. Context free grammar is not closed under

- (A) product
- (B) union
- (C) complementation
- (D) kleen star

53. FSM can recognize

- (A) Any grammar
- (B) Only CG
- (C) Any unambiguous
- (D) Only regular grammar

54. Running time of NFA to DFA conversion

including the case where the NFA has  $\epsilon$ -transition is

- (A)  $O(n^3)$
- (B)  $O(n^3 3^2)$
- (C)  $O(n^3 2^n)$
- (D)  $O(n^2 2^n)$



55. Type 0 grammar generated languages are mapped to

- (A) Linear Bounded Abduction
- (B) Push Down Automata
- (C) Turing Machine
- (D) Finite Automata

56. An image is considered to be a function of a  $(x, y)$  where  $a$  represents

- (A) height of image
- (B) width of image
- (C) amplitude of image
- (D) resolution of image

57. Dilation-Morphological image operation technique is used to

- (A) shrink brighter areas of the image
- (B) diminishes intensity variation over the image
- (C) expands brighter areas of the image
- (D) scales pixel intensity uniformly

58. \_\_\_\_\_ is an image acquisition technique.

- (A) Sobel
- (B) Kirsch
- (C) UBIRIS
- (D) Prewett

59. A digital signaling system is required to operate at 9600 bps. If a signal element encode a 4-bit word, what is the minimum required bandwidth of the channel ?

- (A) 1000 Hz
- (B) 1100 Hz
- (C) 1200 Hz
- (D) 1300 Hz

60. \_\_\_\_\_ is a free distributed public domain software.

- (A) NBIS
- (B) MATLAB
- (C) UBIRIS
- (D) None of the above



61. When the customer arrival are completely random the \_\_\_\_\_ is followed.

- (A) Statistical model
- (B) Deterministic model
- (C) Probability model
- (D) Poisson distributions

62. A tie for leaving variable in Simplex procedure implies

- (A) Optimality
- (B) Cycling
- (C) Degeneracy
- (D) No Solution

63. In case of solution of a two variable linear programming problem by graphical method one constraint line comes parallel to the objective function line, which of the following is correct ?

- (A) Infeasible solution
- (B) Unbounded solution
- (C) Degenerate solution
- (D) Infinite number of optimal solution

64. Which of the following is not true of the simplex method ?

- (A) It signal optimality
- (B) At each iteration, the objective value either stays the same or improves
- (C) It converges in at most m steps, where m is the number of constraints
- (D) It indicates an unbounded or infeasible problem

65. If we were to use opportunity cost value for an unused cell to test optimality. It should be

- (A) Equal to zero
- (B) Most positive number
- (C) Any value
- (D) Most negative number

66. What are the advantages of neural networks over conventional computers ?

- i. They have the ability to learn by example
  - ii. They are more fault tolerant
  - iii. They are more suited for real time operations
- (A) (i) and (ii) are true
  - (B) (i) and (iii) are true
  - (C) All of them are true
  - (D) None of the them are true



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

Single layer associative neural networks do not have the ability to :

- i. perform pattern recognition
  - ii. find the parity of a picture
  - iii. determine whether two or more shapes in a picture are connected or not
- (A) (ii) and (iii) are true  
(B) (ii) is true  
(C) (iii) is true  
(D) All of them are true

**68.** Why did early efforts in AI focus on games such as checkers and chess ?

Unlike the real world, games have clearly defined rules.

- (A) Unlike the real world, the goal of a game is clear  
(B) It's easy to represent the "world" of a game inside the memory of a computer  
(C) Success is easy to measure : Does the program win ?  
(D) All of the above

**69.** Which of the following defines semantics ?

- (A) The set of rules for constructing sentences from words
- (B) The underlying meaning of words and phrases
- (C) A set of idiomatic expressions
- (D) The study of knowledge bases

**70.** Natural-language processing

- (A) Made it possible for computers to pass the Turing test
- (B) Makes computers understand multiple meanings of words
- (C) Cannot flawlessly translate books or conversations
- (D) Utilizes all words in a language

**71.** Which command is used to concatenate all files beginning with the string 'emp' and followed by a non-numeric characters ?

- (A) cat emp [!0 – 9]
- (B) more [emp] [!0 – 9]
- (C) cat emp [x – z]
- (D) cat emp [a – z]



72. The following system calls are related to file operations in UNIX

- I. signal
  - II. kill
  - III. seek
  - IV. unlink
- (A) I and III correct  
(B) III and IV correct  
(C) II and III correct  
(D) II and IV correct

73. Which provides an interface to the TCP/IP suit protocols in Windows 95 and Windows NT ?

- (A) FTP Active – X Control  
(B) TCP/IP Active – X Control  
(C) Calinsock Active – X Control  
(D) HTML Active – X Control

74. The portion of Windows 2000 operating

- system which is not portable is
- (A) processor management
  - (B) user interface
  - (C) device management
  - (D) virtual memory management

75. The .(dot) shell command

- (A) Can take command line argument
- (B) Will fork a child shell to execute the named shell script
- (C) Can be used to change the environment of the current shell
- (D) All of the above



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**Paper III**



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