Test Paper : **III**

Test Subject : **COMPUTER SCIENCE AND APPLICATIONS**

Test Subject Code : **K-2416**

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 AND 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. ಈ ಪುಟದ ಮೇಲ್ತುದಿಯಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
2. ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ಎಪ್ಪತ್ತೈದು ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
3. ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ, ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಯನ್ನು ನಿಮಗೆನೀಡಲಾಗುವುದು. ಮೊದಲ5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಿಕೆಯನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.
   (i) ಪ್ರಶ್ನೆ ಪುಸ್ತಿಕೆಗೆ ಪ್ರವೇಶಾವಕಾಶ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ಟಿಕ್ಕರ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರೆದ ಪುಸ್ತಿಕೆಯನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
   (ii) **ಪುಸ್ತಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ, ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಿಕೆಯನ್ನು ಕೂಡಲೆ5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಿಕೆಗೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.**
4. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ(A), (B), (C) ಮತ್ತು(D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕಪ್ಪಾಗಿಸಬೇಕು.
   ಉದಾಹರಣೆ: (A) (B) ● (D)
   (C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
5. ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಗಳನ್ನು, **ಪತ್ರಿಕೆIII ಪುಸ್ತಿಕೆಯೊಳಗೆ ಕೊಟ್ಟಿರುವ** OMR **ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾತ್ರವೇ ಸೂಚಿಸತಕ್ಕದ್ದು.** OMR ಹಾಳೆಯಲ್ಲಿನ ಅಂಡಾಕೃತಿ ಹೊರತುಪಡಿಸಿ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
6. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.
7. ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಿಕೆಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
8. ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು , ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗಿರುತ್ತೀರಿ.
9. ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMR ನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.
10. ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
11. **ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.**
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 ವ್ಯತ್ಯಾಸಗಳು ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.**

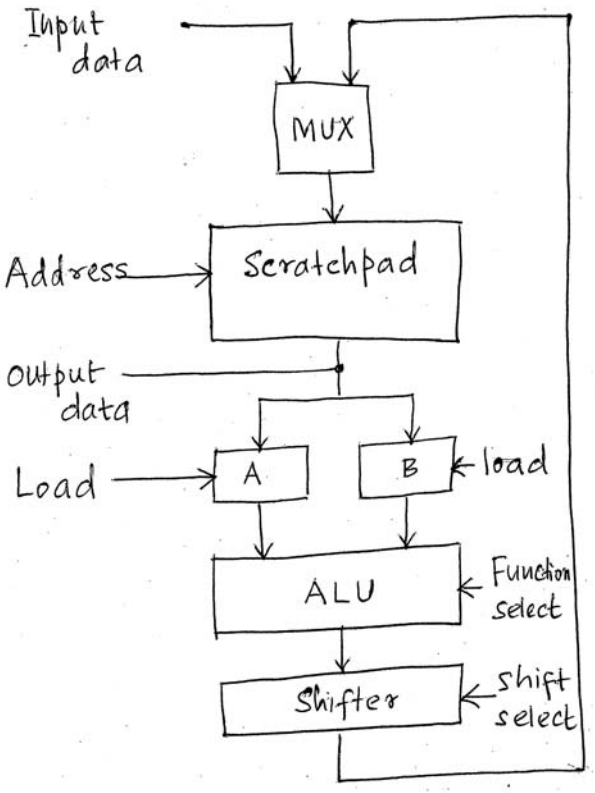
Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of 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) ● (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.**

COMPUTER SCIENCE AND APPLICATIONS
Paper – III

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

1. A processor unit employs a scratchpad memory as shown in the figure below :



The processor consists of 64 registers of eight bits each.

The number of lines needed for the address and for input data respectively is

(A) 6 and 3 (B) 3 and 8

(C) 6 and 8 (D) 3 and 6

2. How many 128 × 8 RAM chips are needed to provide a memory capacity of 2048 bytes ? And how many address lines is used to access 2048 bytes of memory ?

(A) 11, 11 (B) 11, 16

(C) 16, 16 (D) 16, 11

3. A CPU generally handles an interrupt by executing an interrupt service routine

(A) As soon as an interrupt is raised

(B) By checking the interrupt register at the end of the fetch cycle

(C) By checking the interrupt register after finishing the execution of the current instruction

(D) By checking the interrupt register at fixed time intervals

4. Which of the following 8085 microprocessor hardware interrupt has the lowest priority ?

(A) RST 6.5

(B) RST 7.5

(C) TRAP

(D) INTR

5. In the absolute addressing mode

(A) The operand is inside the instruction

(B) The address of the operand is inside the instruction

(C) The register containing the address of the operand is specified inside the instruction

(D) The location of the operand is implicit

6. Consider basic ER and relational models, which of the following is incorrect ?

(A) An attribute of an entity can have more than one value

(B) An attribute of an entity can be composite

(C) In a row of a relational table, an attribute can have more than one value

(D) In a row of a relational table, an attribute can have exactly one value or a null value

7. The following functional dependencies hold for relations R(A, B, C) and S(B, D, E)

$B \rightarrow A$

$A \rightarrow C$

The relation R contains 200 tuples and the relation S contains 100 tuples. What is the maximum number of tuples possible in the natural join $R \bowtie S$?

(A) 100 (B) 200

(C) 300 (D) 2000

8. Which one of the following statement is false ?

(A) Any relation with two attributes is in BCNF

(B) A relation in which every key has only one attribute is in 2NF

(C) A prime attribute can be transitively dependent on a key in a 3NF relation

(D) A prime attribute can be transitively dependent on a key in a BCNF relation

9. A relation EMP DETAILS is defined with attributes empcode (unique), name, street, city, state and pincode.

For any pincode, there is only one city and state. Also, for any given street, city and state, there is just one pincode. In normalization terms, EMP DETAILS is a relation in

(A) 1NF only

(B) 2NF and hence also in 1NF

(C) 3NF and hence also in 2NF and 1NF

(D) BCNF and hence also in 3NF, 2NF and 1NF.

10. A table has fields F1, F2, F3, F4, F5 with the following functional dependencies.
$F1 \rightarrow F3$
$F2 \rightarrow F4$
$(F1.\ F2) \rightarrow F5$
In terms of normalization, this table is in

(A) 1NF (B) 2NF

(C) 3NF (D) 4NF

11. Find the CMY co-ordinates of a color at (0.2, 1, 0.5) in RGB space

(A) (0.6, 1.4, 0.9) (B) (1.2, 2, 1.5)

(C) (0.8, 0, 0.5) (D) (1.2, 1.5, 1.4)

12. What is the rate of (1024×1024) frame buffer with an average access rate per pixel of 200 nanoseconds on a simple color display ?

(A) 5.2 frames/sec.

(B) 17.4 frames/sec.

(C) 2.6 frames/sec.

(D) 1.6 frames/sec.

13. A picture has a resolution of 1024×1280 with each of three colors being represented by 8 bit plane. What is storage requirement for a 10 second animation of the picture with 30 frames per second ? If the compression ratio is 5:1 what is the storage requirements ?

(A) 2250 megabytes

(B) 22 megabytes

(C) 450 megabytes

(D) 10 megabytes

14. $x = at^2$; $y = 2$ at is a parametric equation of

(A) Circle

(B) Rectangular hyperbola

(C) Parabola

(D) Ellipse

15. In Bresenhan's Algorithm error term is initialized to

(A) 0 (B) 1

(C) $-\frac{1}{2}$ (D) -1

16. In object oriented design of software, which of the following is not true ?

(A) Objects inherit properties of the class

(B) Classes are defined based on the attributes of the object

(C) Classes are always different

(D) Object can belong to two classes

17. Which of the following programming languages manages automatic memory management through garbage collection ?

(A) C

(B) C++

(C) XML

(D) C #

18. Which among the following is not a one-sided communication operation defined in MPI-2 ?

(A) MPI_Put

(B) MPI_Get

(C) MPI_Accumulate

(D) MPI_Connect

19. In the context of Chomsky hierarchy, match the appropriate pair of items in the two lists.

List – I	List – II
i) Type 0 grammar	P) Regular grammar
ii) Type 1 grammar	Q) Unrestricted grammar
iii) Type 2 grammar	R) Context free grammar
iv) Type 3 grammar	S) Context sensitive grammar

The correct one is

Codes :

	i	ii	iii	iv
(A)	P	R	S	Q
(B)	R	P	Q	S
(C)	S	Q	P	R
(D)	Q	S	R	P

20. Recursive descent parsing is an example of

(A) Top-down parsing

(B) Bottom-up parsing

(C) Top-down or bottom-up parsing

(D) Predictive parsing

21. Which one of the following is true about the interior gateway routing protocols – Routing Information Protocol (RIP) and Open Shortest Path First (OSPF) ?

(A) OSPF uses distance vector routing and RIP uses link state routing

(B) RIP uses distance vector routing and OSPF uses link state routing

(C) Both RIP and OSPF use link state routing

(D) Both RIP and OSPF use distance vector routing

22. Which one of the following socket API functions converts an unconnected active TCP socket into a passive socket ?

(A) Connect

(B) Bind

(C) Listen

(D) Accept

23. One of the header fields in an IP datagram is the Time-to-Live (TTL) field. Which of the following statements best explains the need for this field ?

(A) It can be used to reduce delays

(B) It can be used to prioritize packets

(C) It can be used to optimize throughput

(D) It can be used to prevent packet looping

24. Which one is correct for PPP ?

(A) Network layer, Byte oriented protocol

(B) Network layer, Bit oriented protocol

(C) Data link layer, Byte oriented protocol

(D) Data link layer, bit oriented protocol

25. Count to infinity is a problem associated with

(A) Link state routing protocol

(B) Distance vector routing protocol

(C) DNS while resolving host name

(D) TCP for congestion window

26. The minimum number of Arithmetic operations required to evaluate the polynomial.

$P(X) = X^5 + 4X^3 + 6X + 5$ for a given value of X using only one temporary variable

(A) 6 (B) 7

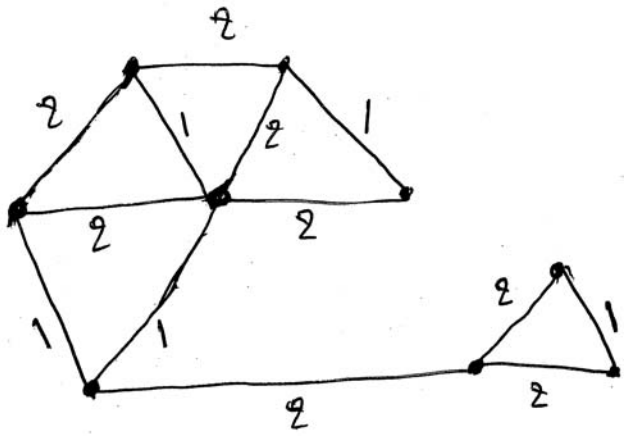
(C) 8 (D) 9

27. You have an array of n elements. Suppose you implement quicksort by always choosing the central element of the array as the Pilot. Then the highest upper bound for the worst case performance is

(A) $O(n^2)$ (B) $O(n \log n)$

(C) $O(n)$ (D) $O(n^3)$

28. The number of distinct minimum spanning trees for the weighted graph given below is



(A) 9 (B) 10

(C) 6 (D) 4

29. A priority queue is implemented as max-heap. Intially, it has 5 elements. The level-order traversal of the heap is : 10, 8, 5, 3, 2. Two new elements 1 and 7 are inserted into the heap in that order. The level-order traversal of the heap after the insertion of the element is

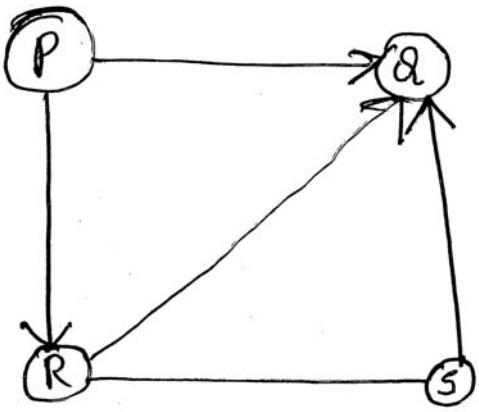
(A) 10, 8, 7, 3, 2, 1, 5

(B) 10, 8, 7, 2, 3, 1, 5

(C) 10, 8, 7, 1, 2, 3, 5

(D) 10, 8, 7, 5, 3, 2, 1

30. Consider the directed graph given below which one of the following is true ?



(A) The graph doesn't have any topological ordering

(B) Both PQRS and SRPQ are topological ordering

(C) Both PSRQ and SPRQ are topological ordering

(D) PSRQ is the only topological ordering

31. Assume m = 5 and n = 2 after executing the following statement in C++, m and n values become

m* = n ++ ;

(A) 10, 4 (B) 10, 3

(C) 9, 4 (D) 8, 5

32. What does not a derived class inherit from a base class ?

I) Constructor methods

II) Destructor

III) Friend

(A) I and II (B) II and III

(C) I, II, III (D) I and III

33. Run-time polymorphism is achieved through

(A) Inheritance

(B) Virtual function

(C) Inheritance and virtual function

(D) Friend, inheritance and poly

34. Default constructor has

(A) One parameter

(B) Two parameters

(C) Three parameters

(D) No parameter

35. Dangling pointer is

(A) Address of a base class

(B) Address which is expired

(C) Address of a container class

(D) Address of an adapter class

36. The extent to which the software can continue to operate despite the introduction of invalid input is called as

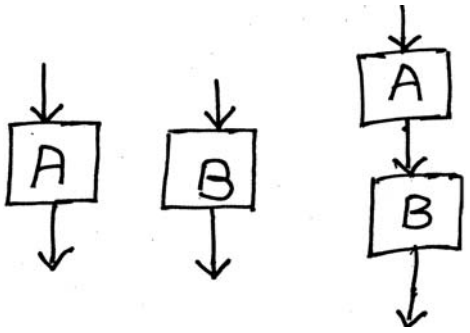
(A) Reliability

(B) Robustness

(C) Fault-tolerance

(D) Portability

37. The cyclomatic complexity of each of the modules A and B shown below is 10. What is the cyclomatic complexity of the sequential integration shown on the right hand side ?



(A) 19

(B) 21

(C) 20

(D) 10

38. Which of the following is a desirable property of a module ?

(A) Low cohesiveness

(B) High coupling

(C) Multi functional

(D) Independency

39. Match the following listing various activities encountered in software life cycle.

a) Requirements capture	1) Module development and integration
b) Design	2) Domain analysis
c) Implementation	3) Structural and behavioral modeling
d) Maintenance	4) Performance tuning

Codes :

(A) a – 3, b – 2, c – 4, d – 1

(B) a – 2, b – 3, c – 1, d – 4

(C) a – 3, b – 2, c – 1, d – 4

(D) a – 2, b – 3, c – 4, d – 1

40. _____modifies source code and / or data in an effort to make it amenable to future changes.

(A) Reverse engineering

(B) Software restructuring

(C) Forward engineering

(D) Software maintenance

41. If the disk head is located initially at 32, find the number of disk moves required with FCFS. If the disk queue of I/O blocks requests are 98, 37, 14, 124, 65, 67.

(A) 310 (B) 325

(C) 321 (D) 239

42. Resources are allocated to the process on non-sharable basis is

(A) Mutual exclusion

(B) Hold and wait

(C) No pre-emption

(D) Circular wait

43. Match the following :

a) Multilevel feedback queue	1) Time slicing
b) FCFS	2) Criteria to move process between queues
c) Shortest process next	3) Batch processing
d) Round Robin scheduling	4) Exponential smoothing

Codes :

(A) a – 1, b – 3, c – 2, d – 4

(B) a – 4, b – 3, c – 2, d – 1

(C) a – 3, b – 2, c – 4, d – 1

(D) a – 2, b – 3, c – 4, d – 1

44. We have three processes P_0, P_1 and P_2 whose arrival time and burst time are given below. If the pre-emptive Shortest Job First (SJF) scheduling algorithm is carried out only at arrival or completion of processes then the average waiting time for the three processes is

Process	Arrival Time	Burst Time
P_0	0 ms	9 ms
P_1	1 ms	4 ms
P_2	2 ms	9 ms

(A) 7.33 ms

(B) 6.3 ms

(C) 5.0 ms

(D) 4.33 ms

45. Deadlocks can be described by which graph ?

(A) Resource-allocation Graph

(B) Hamiltonian Graph

(C) Complete Graph

(D) Euler Graph

46. Which statement is the best characterization of cognitive modeling ?

(A) The formulation of algorithmic description of building blocks for intelligent systems

(B) The formal specification of abstract reasoning mechanisms for system that represent and manipulate knowledge

(C) The construction of systems that exhibit behaviors necessary for solving tasks requiring intelligence

(D) An attempt to describe the way the human mind functions

47. What takes input as an object described by a set of attributes ?

(A) Tree

(B) Graph

(C) Decision graph

(D) Decision tree

48. Match the following terms to their meanings :

1) Turing test	a) Software designed to replicate the knowledge of a human "Expert"
2) Expert system	b) The "real" meaning of word and phrases
3) Checker and chess	c) Set of rules for constructing sentences from words
4) Semantics	d) If it acts intelligent, it is intelligent
5) Syntax	e) The first area of AI research

Codes :

(A) 1 – d, 2 – a, 3 – e, 4 – b, 5 – c

(B) 1 – d, 2 – a, 3 – b, 4 – c, 5 – e

(C) 1 – d, 2 – c, 3 – a, 4 – e, 5 – b

(D) 1 – d, 2 – e, 3 – a, 4 – c, 5 – b

49. Traditional AI techniques still used today include all of the following except

(A) Searching

(B) Heuristics

(C) Pattern recognition

(D) Parallel processing

50. Which AI system finds and identifies patterns; for instance; in the words you use ?

(A) Expert system

(B) Intelligent system

(C) Neural network

(D) Fuzzy logic

51. Which of the following definitions generates the same language as L, where $L = \{ww^R \mid w \in \{a, b\}^*\}$?

(A) $S \rightarrow aSb \mid bSa \mid \in$

(B) $S \rightarrow aSa \mid bSb \mid \in$

(C) $S \rightarrow aSb \mid bSa \mid aSa \mid bSb \mid \in$

(D) $S \rightarrow aSb \mid bSa \mid aSa \mid bSb$

52. Which of the following languages is regular ?

(A) $\{w\, w^R \mid w \in \{0, 1\}^+\}$

(B) $\{wcw^R \mid c, w \in \{0, 1\}^+\}$

(C) $\{w\, w^R c \mid c, w \in \{0, 1\}^+\}$

(D) $\{c\, w\, w^R \mid c, w \in \{0, 1\}^+\}$

53. Which of the following statements is not true ?

(A) CFLs are closed under union

(B) Concatenation of two CFLs is CFL

(C) CFLs are closed under intersection

(D) CFLs are not closed under complementation

54. The language accepted by the PDA $M = (\{q_0, q_1, q_2\}, \{a, b\}, \delta, q_0, z, \{q_2\})$ with transitions $\delta(q_0, a, z) = \{(q_0, a)\}$, $\delta(q_0, a, a) = \{(q_0, a)\}$, $\delta(q_0, b, a) = \{(q_1, \in)\}$, $\delta(q_1, b, a) = \{(q_1, \in)\}$ and $\delta(q_1, \in, z) = \{(q_2, \in)\}$ is

(A) $L = \{a^n b^{n+1} \mid n \geq 1\}$

(B) $L = \{a^{n+1} b^n \mid n \geq 1\}$

(C) $L = \{a^n b^n \mid n \geq 0\}$

(D) $L = \{a^n b^n \mid n \geq 1\}$

55. L can be recognized by a multitape Turing machine with time complexity f, then L can be recognized by a one tape machine with time complexity

(A) $O(f^1)$

(B) $O(f^2)$

(C) $O(f^3)$

(D) $O(f^{n-1})$

56. How many frequencies does a full-duplex QAM-64 modem use ?

(A) 2 (B) 4

(C) 8 (D) 64

57. Data link protocols always put the CRC in a trailer rather than in a header because

(A) It is not permitted in the beginning

(B) Creates inconsistency

(C) Work reduced by half

(D) Computation is not possible

58. A network on the internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle ?

(A) 1024 (B) 2048

(C) 4096 (D) 8192

59. A router has just received the following new IP addresses

57.6.96.0/21

57.6.104.0/21

57.6.112.0/21

57.6.120.0/21

If all of them use the same outgoing line, the aggregated IP is

(A) 57.6.96/19 (B) 57.6.96/21

(C) 57.6.120/9 (D) 57.6.120/21

60. What is the first additions in the block if one of the address is

167.199.170.82/27 ?

(A) 167.199.170.32/27

(B) 167.199.170.54/27

(C) 167.199.170.64/27

(D) 167.199.170.72/27

61. Which statement is true for feasible solution ?

(A) Only one constraint is violated

(B) All the constraints are satisfied

(C) All the constraints are violated

(D) At least one constraint is violated

62. For the linear programming problem

Maximize $Z = 10x_1 + 3x_2$

Subject to

$2x_1 + 3x_2 \leq 18$

$6x_1 + 5x_2 \geq 60$

x_1 and $x_2 \geq 0$

What is the value for Z ?

(A) 600

(B) 180

(C) 30

(D) Infeasible solution

63. The dual of the following primal problem is

Minimize $Z = 20x_1 + 40x_2$

Subject to

$2x_1 + 20x_2 = 40$

$20x_1 + 3x_2 = 20$

$4x_1 + 15x_2 = 30$

x_1 and $x_2 \geq 0$

(A) Maximize $y = 40\ y_1 + 20\ y_2 + 30\ y_3$

Subject to

$2y_1 + 20y_2 + 4y_3 \leq 20$

$20y_1 + 3y_2 + 15y_3 \leq 40$

where y_1, y_2 and y_3 are unrestricted in sign

(B) Minimise $y = 40y_1 + 20y_2 + 30y_3$

Subject to

$2y_1 + 20y_2 + 4y_3 \leq 20$

$20y_1 + 3y_2 + 15y_3 \leq 40$

where y_1, y_2 and y_3 are unrestricted in sign

(C) Maximize $y = 20y_1 + 40y_2$

Subject to

$2x_1 + 20x_2 = 40$

$20x_1 + 3x_2 = 20$

$4x_1 + 15x_2 = 30$

x_1 and $x_2 \geq 0$

(D) Minimize $y = 20y_1 + 40y_2$

Subject to

$2x_1 + 20x_2 = 40$

$20x_1 + 3x_2 = 20$

$4\ x_1 + 15x_2 = 30$

x_1 and $x_2 \geq 0$

64. Basic feasible solution using North West corner method yields

Destination

		P	Q	R	S	Supply
Source	A	3	1	7	4	300
	B	2	6	5	9	400
	C	8	3	3	2	500
Demand		250	350	400	200	

(A) 4000

(B) 4200

(C) 4400

(D) 4800

65. Separable programming technique used to solve

(A) Transportation problem

(B) Assignment problem

(C) Nonlinear problem

(D) Critical path method problem

66. Fuzzy logic is a form of

(A) Two-valued logic

(B) Crisp set logic

(C) Many-valued logic

(D) Binary set logic

67. A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of the proportionality being equal to 2. The inputs are 2, 6, 5 and 10 respectively. The output will be

(A) 69 (B) 138

(C) 34 (D) 33

68. The height h(A) of a fuzzy set A is defined as h(A) = SUP A(X) where X belongs to A. Then the fuzzy set A is normal when

(A) h(A) = 0 (B) h(A) < 0

(C) h(A) = 1 (D) h(A) < 1

69. Given U = {1, 2, 3, 4, 5, 6, 7}
A = {(3, 0.7), (5, 1) , (6, 0.8)}
Then A will be :

(A) {(4, 0.7), (2, 1), (1, 0.8)}

(B) {(4, 0.3), (5, 0), (6, 0.2)}

(C) {(1, 1), (2, 1), (3, 0.3), (4,1), (6,0.2), (7, 1)}

(D) {(3, 0.3), (6, 0.2)}

70. Which of the following is /are true for neural networks ?

(a) The training time depends on the size of the network

(b) Neural network can be simulated on a conventional computer

(c) Artificial neurons are identical in operation to biological ones

(A) a), b) and c) are true

(B) Only b) is true

(C) a) and b) are true

(D) Only a) is true

71. Which of the following tools can be used to keep track of evolving versions of a file

(A) make (B) yacc

(C) sccs (D) dv

72. Choose the incorrect statement.

(A) Shell scripts can accept arguments

(B) Shell scripts are interpreted

(C) Shell is a programming language

(D) Shell scripts are compiled

73. Which of the following shell commands displays the contents of each of the command line arguments, one by one ?

(A) Cat $* (B) Cat ' $* '

(C) Cat "@" (D) Cat " $*"

74. The Win 32 library provides two classes for creating the main window. These are

(A) WNDCLASS and WNDCLASSX

(B) WINBASE and WINNT

(C) WINMAIN and WINCLASS

(D) WNDMAIN and WNDMAINX

75. A Lex Compiler generates

(A) Lex Object Code

(B) Transition Tables

(C) C Tokens

(D) Expressions

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ
Space for Rough Work

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ
Space for Rough Work