पुस्तिका में पृष्ठों की संख्या : 16
Number of Pages in Booklet : 16

पुस्तिका में प्रश्नों की संख्या : 100
No. of Questions in Booklet : 100

प्रश्न-पत्र पुस्तिका संख्या /
Question Paper Booklet No. 3009301

SVPCS-91

परीक्षा दिनांक 5.11.19(AN)
उपाचार्य / प्रिन्सिपल I.T.I -2018

Subject Code : 03

विषय / SUBJECT :
COMPUTER SCIENCE

समय : 2.00 घण्टे
Time : 2.00 Hours

अधिकतम अंक : 100
Maximum Marks : 100

प्रश्न-पत्र पुस्तिका एवं उत्तर पत्रक के पेपर सील/पॉलिथीन बैग को खोलने पर परीक्षार्थी यह सुनिश्चित कर लें कि उसके प्रश्न-पत्र पुस्तिका पर वही प्रश्न-पत्र पुस्तिका संख्या अंकित है जो उत्तर पत्रक पर अंकित है । इसमें कोई भिन्नता हो तो वीक्षक से दूसरा प्रश्न-पत्र प्राप्त कर लें । ऐसा न करने पर जिम्मेदारी अभ्यर्थी की होगी ।

The candidate should ensure that Question Paper Booklet No. of the Question Paper Booklet and Answer Sheet must be same after opening the Paper Seal / Polythene bag. In case they are different, a candidate must obtain another Question Paper. Candidate himself shall be responsible for ensuring this.

परीक्षार्थियों के लिए निर्देश

1. **सभी** प्रश्नों के उत्तर दीजिए ।
2. **सभी** प्रश्नों के अंक समान हैं ।
3. प्रत्येक प्रश्न का केवल **एक** ही उत्तर दीजिए ।
4. एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा ।
5. प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं, जिन्हें क्रमशः 1, 2, 3, 4 अंकित किया गया है । अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले अथवा बबल को उत्तर पत्रक पर **नीले बॉल प्वाइंट पेन** से गहरा करना है ।
6. **OMR** उत्तर पत्रक इस परीक्षा पुस्तिका के अन्दर रखा है । जब आपको परीक्षा पुस्तिका खोलने को कहा जाए, तो उत्तर पत्र निकाल कर ध्यान से केवल **नीले बॉल पॉइंट पेन** से विवरण भरें ।
7. **प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा ।** गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है । किसी भी प्रश्न से संबंधित गोले या बबल को खाली छोड़ना गलत उत्तर नहीं माना जायेगा ।
8. मोबाइल फोन अथवा इलेक्ट्रोनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है । यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी ।
9. कृपया अपना रोल नम्बर ओ.एम.आर. पत्रक पर सावधानीपूर्वक सही भरें । गलत अथवा अपूर्ण रोल नम्बर भरने पर **5 अंक** कुल प्राप्तांकों में से काटे जा सकते हैं ।

चेतावनी : अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराते हुए विविध नियमों-प्रावधानों के तहत कार्यवाही की जाएगी । साथ ही विभाग ऐसे अभ्यर्थी को भविष्य में होने वाली विभाग की समस्त परीक्षाओं से विवर्जित कर सकता है ।

INSTRUCTIONS FOR CANDIDATES

1. Answer **all** questions.
2. **All** questions carry equal marks.
3. Only **one** answer is to be given for each question.
4. If more than one answers are marked, it would be treated as wrong answer.
5. Each question has four alternative responses marked serially as **1, 2, 3, 4**. You have to darken only one circle or bubble indicating the correct answer on the Answer Sheet using **BLUE BALL POINT PEN**.
6. The **OMR** Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars carefully with **blue ball point pen** only.
7. **1/3 part of the mark(s) of each question will be deducted for each wrong answer.** A wrong answer means an incorrect answer or more than one answers for any question. Leaving all the relevant circles or bubbles of any question blank will not be considered as wrong answer.
8. Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt as per rules.
9. Please correctly fill your Roll Number in O.M.R. Sheet. **5 Marks** can be deducted for filling wrong or incomplete Roll Number.

Warning : If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would liable to be prosecuted. Department may also debar him/her permanently from all future examinations.

इस परीक्षा पुस्तिका को तब तक न खोलें जब तक कहा न जाए ।
Do not open this Test Booklet until you are asked to do so.

1. Which statement among the following statements is false ?

(1) PUSH C is a zero-address instruction.

(2) MUL X, R1, R2 is a two-address instruction.

(3) LOAD C is a one-address instruction.

(4) ADD R2, D is a two address instruction.

2. Which is not the valid mapping scheme of cache memory organisation ?

(1) Set associative mapping

(2) Direct mapping

(3) Associative mapping

(4) Set direct mapping

3. The correct sequence for the given Manchester encoding is

(1) 0110000011101110

(2) 1001111100010001

(3) 0110000011001110

(4) 1000111100110001

4. Which is not a valid register of a DMA controller ?

(1) Program counter

(2) Word count register

(3) Control register

(4) Address register

5. Which is not a valid characteristic of RISC processor ?

(1) Memory access limited to load/store instructions

(2) Variable length instruction formats

(3) Single cycle instruction execution

(4) Hardwired rather than microprogrammed control unit

6. The use of which one of the following in a computer is justified by the principle of locality ?

(1) DMA

(2) Virtual Memory

(3) Software Interrupt

(4) Cache Memory

7. Instruction pipeline cannot deviate from its normal operation due to

(1) resource conflicts

(2) data dependency conflicts

(3) time delay variation in segments

(4) branch difficulties

8. Given an array named STORE with 20 elements, what is the correct way to access the 20th element ?

(1) STORE [20]

(2) STORE [end]

(3) STORE [last]

(4) STORE [19]

9. What is the value of the following ?

sqrt(sqrt(pow(2,4)));

(1) 1 (2) 2

(3) 4 (4) 16

10. Which is not a valid access specifier among the following ?

(1) protected (2) public

(3) derived (4) private

11. Which of the following sequence of register transfers correspond to instruction fetch ?

(1) AR ← PC; IR ← M[AR]; PC ← PC + 1

(2) IR ← PC; AR ← M[IR]; PC ← PC + 1

(3) PC ← IR; AR ← IR; PC ← PC + 1

(4) AR ← IR; IR ← M[PC]; PC ← PC + 1

12. Given the following enumerated data type definition, what is the value of SAT ?

enum myType{SUN=3,MON=1,TUE=3, WED,THUR,FRI,SAT,NumDays};

(1) 7

(2) 6

(3) 5

(4) Unknown

13. Which of the following are valid declarations for an assignment operator for a class named myClass ?

(1) void friend operator = (myClass& left, const myClass& source);

(2) void operator = (myClass& left, const myClass& source);

(3) void friend operator = (const myClass& soruce);

(4) void operator = (const myClass& source);

14. Which of the following class member function automatically initializes the data members ?

(1) An operator

(2) A constructor

(3) A cast

(4) The init function

15. Which is not a defining characteristic feature of Object Oriented Languages ?

(1) Reusability

(2) Inheritance

(3) Polymorphism

(4) Recursion

16. Which function is used to perform some action when the object is to be destroyed ?

(1) finalize( )

(2) delete( )

(3) main( )

(4) destroy( )

17. Which statement is correct for get and put function ?

(1) The get function reads one character value and put function outputs one character value.

(2) The get function reads one integer value and put function outputs one integer value.

(3) The get function reads one float value and put function outputs one float value.

(4) The get function reads one character value and put function outputs one integer value.

18. Which among the followings can show polymorphism ?

(1) Overloading | |

(2) Overloading +=

(3) Overloading <<

(4) Overloading &&

19. A queue in which items are inserted and removed from any position based on same property :

(1) deque

(2) property queue

(3) priority queue

(4) preference queue

20. The inorder and preorder traversal of a binary tree are dbeafcg and abdecfg respectively, the post-order traversal of such binary tree is

(1) debfgca (2) edbgfca

(3) edgbfca (4) defgbca

21. Which of the following software bridges the specification gap between two programming languages ?

(1) A language translator

(2) A language migrator

(3) A pre-processor

(4) A detranslator

22. An expected running time of randomized quick sort is

(1) O(loglogn)

(2) $O(n^2)$

(3) O(n)

(4) O(nlogn)

23. Match the following :

A. $T(n) = T(n-1) + n$	1. $\Theta(n^2)$
B. $T(n) = T(n/2) + c$	2. $\Theta(\log n)$
C. $T(n) = T(n/2) + n$	3. $\Theta(n)$
D. $T(n) = 2T(n/2) + 1$	4. $\Theta(n\log n)$

Codes :

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

24. _____ is an algorithm design method that can be used when the solution to a problem may be viewed as the result of a sequence of decisions.

(1) Greedy method

(2) Sequential programming

(3) Dynamic programming

(4) Linear programming

25. Which of the following statement is false ?

(1) A connected undirected graph is guaranteed to have at least $|V| - 1$ edges.

(2) A strongly connected directed graph is guaranteed to have at least $|V| - 1$ edges.

(3) In a DAG, the number of distinct paths between two vertices is at most $|V|^2$

(4) Depth first search on a connected undirected graph G will visit all of the vertices of G.

26. Dijkstra's algorithm is based on which paradigm ?

(1) Greedy paradigm

(2) Backtracking paradigm

(3) Dynamic programming paradigm

(4) Divide and conquer paradigm

27. What type of tree walk on a red black tree outputs the elements in sorted order ?

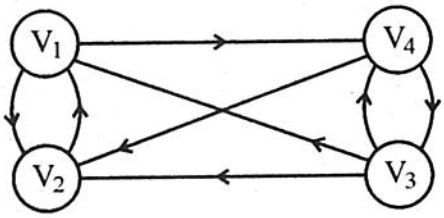
(1) Preorder traversal

(2) Post order traversal

(3) In order traversal

(4) Both preorder and post order traversal

28. Which is the correct adjacency matrix of the given diagraph ?



(1)

	V_1	V_2	V_3	V_4
V_1	1	1	0	1
V_2	1	0	0	0
V_3	1	0	0	1
V_4	0	1	0	0

(2)

$$\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}$$

(3)

$$\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}$$

(4)

$$\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}$$

29. Which is not an acceptable asymptotic notation to represent the time complexity ?

(1) Theta (θ) (2) Omega (ω)

(3) Big Oh (O) (4) Phi (ϕ)

30. One can get different minimum spanning trees if the following algorithm is applied (the edge weights are distinct) :

(1) Prim's algorithm

(2) Dijkstra's algorithm

(3) Kruskal's algorithm

(4) Mark-Sweep algorithm

31. Given an empty stack, after performing push (20), push (2), push (3), pop, pop, push (6), pop. What will be the value of the top of the stack ?

(1) 20 (2) 3

(3) 2 (4) 6

32. The action which requires knowledge of translated and linked origins and information about address sensitive instructions is called

(1) Compilation (2) Linking

(3) Relocation (4) Binding

33. The concept used b Strassen's algorithm to achieve $O(n^{\log 7})$ time to multiply two $n \times n$ matrices is known as

(1) Breadth first search

(2) Divide and conquer

(3) Greedy method

(4) Dynamic programming

34. Which breaks the deadlock condition in OS ?

I. Pre-emptiveness

II. Acyclic

III. Mutual exclusion

IV. Hold and wait

(1) III and IV

(2) II and IV

(3) I and II

(4) I and III

35. The correct option for the unix command which is used to compare two sorted files ?

(1) cmp (2) comm

(3) diff (4) cmsort

36. Which is not a phase for creation of a process ?

(1) fork( )

(2) run( )

(3) execute( )

(4) wait( )

37. Which is not an operating system used for mobile devices ?

(1) Android OS

(2) Tab OS.

(3) Symbian OS

(4) Web OS

38. Match the following :

Disk array type	Function
A. Raid 0	1. Bit interleaved parity organization
B. Raid 1	2. Error correction code organization
C. Raid 2	3. Block interleaved parity organization
D. Raid 3	4. Block interleaved distributed parity
E. Raid 4	5. Disk array with stripping without parity organization

Codes :

	A	B	C	D	E
(1)	5	4	3	2	1
(2)	5	2	1	4	3
(3)	5	4	1	3	2
(4)	5	1	2	3	4

39. The segmentation with paging in memory management leads to

(1) Minimize internal fragmentation

(2) Maximize external fragmentation

(3) Minimize external fragmentation

(4) Maximize internal fragmentation

40. A thread has a separate resource. Which resource is shared by more than one threads ?

(1) stack

(2) signals and signal handlers

(3) program counter

(4) thread state

41. The process cannot switch to the following state :

(1) Running

(2) Ready

(3) Return

(4) Blocked

42. Which is not a valid process scheduling algorithm in interactive systems ?

(1) round robin scheduling

(2) fair share scheduling

(3) shortest job first

(4) priority scheduling

43. Which of the following is a correct statement with respect to XML ?

(1) XML does not preserve white-spaces.

(2) XML have predefined tags only.

(3) XML is used to display data only.

(4) XML is case sensitive.

44. The functional dependency, if $A \Rightarrow B$, then $A, C \Rightarrow B, C$ is referred to as

(1) Reflexivity

(2) Transitivity

(3) Augmentation

(4) Union

45. Which of the following is not a data manipulation operation ?

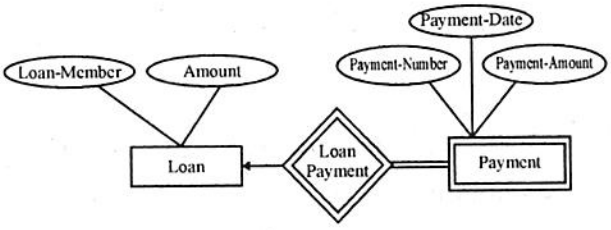
(1) Encryption of information stored in the database.

(2) Insertion of new information into the database.

(3) Deletion of information from the database.

(4) Modification of information stored in the database.

46. Weak entity in the following ER diagram is



(1) Loan

(2) Loan payment

(3) Payment

(4) Both Loan payment and Payment

47. The following query written in relational algebra will find :

$\pi_{\text{cust-name, branch-name}}$ (depositer $\bowtie$ account) $\div$ $\pi_{\text{branch-name}}$ ($\sigma_{\text{branch-city}}$ = "Goa" (branch))

(1) All branches in Goa

(2) All customers in any branch other than Goa

(3) All customers who have an account at all branches in Goa.

(4) All customers who do not have an account in any branch in Goa.

48. Which is not a valid join in SQL ?

(1) left outer join

(2) partial outer join

(3) full outer join

(4) natural full outer join

49. Which is not a fundamental operation in the relational algebra ?

(1) natural join

(2) cartesian product

(3) set difference

(4) rename

50. 5NF refers to

(1) Absence of multi-valued dependencies

(2) Foreign key

(3) Super key

(4) Non-loss decomposition

51. In which pattern the coding and testing are performed ?

(1) Top-down manner

(2) Bottom-up manner

(3) Ad hoc manner

(4) Cross-sectional manner

52. STLC is related to which model ?

(1) Waterfall Model

(2) RAD Model

(3) V Model

(4) Spiral Model

53. Which is not a valid component of a E-R diagram ?

(1) dashed lines

(2) double lines

(3) double rectangles

(4) dashed ellipses

54. Which is not a valid scheduling tool used in managing time resource in software project management ?

(1) PERT chart

(2) DFD

(3) GANTT chart

(4) Critical path analysis

55. Which is not a valid tool for Software Quality Assurance (SQA) ?

(1) Inspection

(2) Auditing

(3) Mean Time Between Failure (MTBF)

(4) Technical Review

56. Which is not a valid step of requirement definition ?

(1) Requirements gathering (elicitation)

(2) Analyse and model the requirements

(3) Design specification checking and feasibility study

(4) Review and validate SRS and get confirmation from users

57. Which one is not a software maintenance model ?

(1) Corrective maintenance

(2) Effective maintenance

(3) Adaptive maintenance

(4) Perfective maintenance

58. Which of the following is contention free protocol ?

(1) Pure Aloha

(2) Ethernet

(3) Non-persistent CSMA

(4) Token ring

59. For the N processes the number of election messages for the Bully and Ring Algorithms can be

(1) $(N^2 - 1)$ and $2N$

(2) $(N^2 + 1)$ and $2N^2$

(3) $(N^2 - 1)$ and N^2

(4) Both have N^2

60. The _____ are used to model a system's behaviour in response to internal and external events.

(1) Activity diagrams

(2) Data flow diagrams

(3) E-R diagrams

(4) State diagrams

61. The total delay in datagram networks is calculated as

(1) total transmission time + total propagation delay + total waiting time

(2) total transmission time + total waiting time

(3) total propagation delay + total waiting time

(4) total transmission time + total propagation delay

62. A block of addresses is granted to a small organization. If one of the address is 205.16.37.39/28. What is the value of first address and total number of addresses in the block ?

(1) 205.16.37.34, 14

(2) 205.16.37.32, 16

(3) 205.16.37.36, 12

(4) 205.16.37.38, 8

63. The approach of transport layer; in which if data comes into the sender node in small pieces, it sends the first piece and buffer all the rest until the first piece is acknowledged; is called

(1) Silly Window syndrome

(2) RTP (Real Time, Transport Protocol)

(3) Nagle's algorithm

(4) Slow start algorithm

64. Which is not a symmetric key algorithm ?

(1) SHA-2 (2) AES

(3) Triple DES (4) DES

65. It is not a valid socket primitive for TCP protocol :

(1) REJECT (2) BIND

(3) SOCKET (4) LISTEN

66. Which protocol is not used for electronic mail ?

(1) SMTP (2) MIME

(3) IMAP (4) SNMP

67. Which is not considered as data mining technique ?

(1) Parsing

(2) Decision tree

(3) Artificial neural network

(4) Regression

68. In JavaScript each window object has sub-objects, which called

(1) Features (2) Properties

(3) Characteristics (4) Qualifiers

69. Which protocol is not a transport layer protocol ?

(1) UDP (2) SCTP

(3) TCP (4) SNTP

70. Applications that work with cloud computing that have low margins and usually low risk are called _____ applications.

(1) high touch

(2) low touch

(3) moderate touch

(4) low touch and low risk

71. Which are not webservers among the following ?

(1) Apache & IIS

(2) PWS & IIS

(3) ASP & JSP

(4) Apache & Jigsaw

72. Which is not a valid cloud computing (service) model ?

(1) Infrastructure as a Service (IaaS)

(2) Platform as a Service (PaaS)

(3) Software as a Service (SaaS)

(4) Firmware as a Service (FaaS)

73. PHP scripts are executed on

(1) Client computer

(2) Server computer

(3) ISP computer

(4) It depends on PHP objects.

74. Data warehouses provides

(1) Transaction responsiveness

(2) Storage, functionality responsiveness to queries

(3) Demand and supply responsiveness

(4) Storage, demand and supply operation

75. The network capacity of a wireless network can be improved by

(1) increasing the number of cells

(2) decreasing the number of cells

(3) increasing the size of cells

(4) increasing the number of mobile user in a cell.

76. Which term is used to describe user's view of data item types and record types ?

(1) schema (2) view

(3) subschema (4) instance

77. A repository consists of 2^{20} documents and if the word w appears in 2^{10} of these documents, then the Inverse Document Frequency (IDF_W) shall be

(1) 2^2 (2) 2^{10}

(3) 10 (4) 20

78. Banker's algorithm is based on

(1) Ostrich algorithm

(2) Recovery algorithm

(3) Peterson algorithm

(4) Dijkstra algorithm

79. The following device is used to join different kinds of networks at data link layer :

(1) Repeater

(2) Gateway

(3) Router

(4) Bridge

80. If n is the number of flip-flops, then the register capacity will be

(1) n^2 (2) 2^n

(3) $(n + 2)$ (4) $\frac{n}{2}$

81. Which one of the following statement is correct about keys in databases ?

(1) A superkey is also a candidate key.

(2) A primary key is also a candidate key.

(3) A primary key is also a minimal key.

(4) A minimal superkey is a candidate key.

82. Which of the following is not a Non-functional testing ?

(1) Performance testing

(2) Unit testing

(3) Load testing

(4) Reliability testing

83. Which of the following is not a Unified Modeling Language (UML) diagram ?

(1) Class diagram

(2) Deployment diagram

(3) Sequence diagram

(4) Star diagram

84. Which of the following is the full form of URL ?

(1) Uniform Request Location

(2) Unicore Resource Locator

(3) Uniform Resource Locator

(4) Unified Request Locator

85. Alpha testing is done at

(1) User's end

(2) Developer's end

(3) User's and Developer's end

(4) Client's end

86. Binary addition of two 8-bit numbers 10101010 and 11001100 is

(1) 101110110 without any carry

(2) 01110110 with carry one (1)

(3) 10101011 with carry one (1)

(4) 10111011 with carry one (1)

87. The simplification of given function is

$F(A, B, C, D, E) = A + \bar{A} \cdot B + A \cdot D(B + E) \cdot (B \cdot C + D \cdot E)$

(1) A + C (2) A + D

(3) A + B (4) B + D

88. The minimum amount of time that data must be present after the clock trigger arrives is known as

(1) set up time (2) process time

(3) hold time (4) waiting time

89. An illegal nibble in BCD system is

(1) 1010 (2) 1000

(3) 0010 (4) 0110

90. It is not a logic family of digital ICs design :

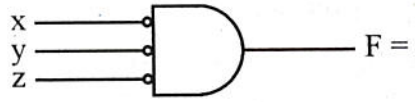
(1) MOS

(2) CMOS

(3) ECL

(4) Schottky ECL

91. The output of the following gate is :



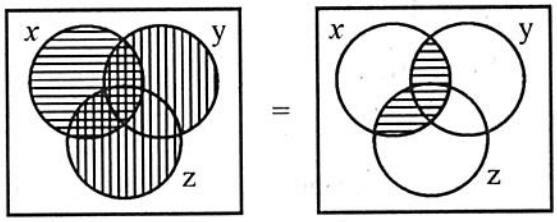
(1) $x + y + z$

(2) $(xyz)'$

(3) $x'y'z'$

(4) $((x + y + z)')'$

92. The following Venn diagrams represents :



(1) Distributive law

(2) Associative law

(3) Absorption law

(4) DeMorgan's law

93. A combinational circuit that converts binary information from n input lines to a maximum of 2^n unique output lines, is known as

(1) Demultiplexer

(2) Decoder

(3) Encoder

(4) Multiplexer

94. The decimal equivalent of the binary number 1001111 is

(1) 69 (2) 79

(3) 89 (4) 99

95. The minimum number of flip-flops required to make a counter that counts from 0 to 20 is

(1) 2 (2) 5

(3) 10 (4) 20

96. When an instruction is required to be brought from memory to CPU, on which one of the following bus is it fetched ?

(1) Address bus

(2) Data bus

(3) Control bus

(4) Peripheral bus

97. Whenever the two instructions needs the same hardware resource at the same instants of time, the following pipeline hazard occurs :

(1) Data hazard

(2) Structure hazard

(3) Control hazard

(4) Both control and data hazard

98. 9 can be represented in 8-bit EBCDIC code as

(1) 10010000 (2) 00011001

(3) 00111001 (4) 11111001

99. For a memory system having the following specification : size of the main memory is 4 K blocks, size of the cache is 128 blocks and the block size is 16 words. Assuming that the system uses associative mapping, the cache field parameters would be

(1) Word field = 6 bits, Tag field = 10 bits, No. of bits in main memory address = 14

(2) Word field = 4 bits, Tag field = 10 bits, No. of bits in main memory address = 14

(3) Word field = 6 bits, Tag field = 12 bits, No. of bits in main memory address = 16

(4) Word field = 4 bits, Tag field = 12 bits, No. of bits in main memory address = 16

100. How many RAM chips are required to construct 256 K × 16 memory using 16 K × 1 RAM ?

(1) 512

(2) 256

(3) 128

(4) 56

रफ कार्य के लिए स्थान / SPACE FOR ROUGH WORK