1. Consider the following three algorithms:

    (i)   Bully algorithm   **Himexam.com**

    (ii)   Bus algorithm

    (iii)   Ring algorithm

    Which of the following represents election algorithms in a distributed system?

    (A)   Only (i) and (ii)   (B)   Only (ii) and (iii)

    (C)   Only (i) and (iii)   (D)   (i), (ii) and (iii)

2. The n-dimensional hypercube or n-cube is a highly concurrent multiprocessor architecture consisting of _____ nodes such that each node is connected to _____ neighbours.

    (A) 2^n, (n-1)   (B) 2^{n-1}, (n-1)

    (C) 2^n, n   (D) 2^{n-1}, n

3. A single control unit that dispatches the same Instruction to various processors is_____

    (A)   SIMD   (B)   SPMD

    (C)   MIMD   (D)   MISD

4. _____ permits many processes to run in parallel using shared resources without interfering with one another in a distributed system.

    (A)   Replication Transparency   (B)   Concurrency Transparency

    (C)   Scaling Transparency   (D)   Performance Transparency

5. Communication is achieved in distributed system by ……………........

    (A)   Disk Sharing   (B)   Shared memory location

    (C)   File sharing   (D)   Message passing

6. The distributed system is a collection of (P) and communication is achieved in distributed system by (Q), where (P) and (Q) are:

(A)   Loosely coupled hardware on tightly coupled software and disk sharing, respectively.

(B)   Tightly coupled hardware on loosely coupled software and shared memory, respectively.

(C)   Tightly coupled software on loosely coupled hardware and message passing, respectively.

(D)   Loosely coupled software on tightly coupled hardware and file sharing, respectively.

7.   Inter process communication in distributed systems :

(A)   allows processes to communicate and synchronize their actions using the same address space.

(B)   allows processes to communicate and synchronize their actions without using the same address space.

(C)   allows the processes to only synchronize their actions without communication.

(D)   allows processes to communicate without synchronizing their actions using the same address space.

8.   In which of the following algorithm, the disk arm starts at one end of the disk and moves toward the other end, servicing requests till the other end of the disk. At the other end, the direction is reversed, and servicing continues.

(A)   LOOK   (B)   C-LOOK

(C)   SCAN   (D)   C-SCAN

9.   Which of the following page replacement algorithm exhibits Belady's anomaly?

(A)   Least recently used   (B)   First in First out

(C)   Optimal page replacement (D)   Most recently used

10. Which of the following is correct statement?

(A)   CPU generates logical address while Memory management unit generates physical address.

(B)   Memory management unit generates logical address while CPU generates physical address.

(C)   Both logical address and physical address are generated by Memory management unit.

(D)   Both logical address and physical address are generated by CPU.

11.   A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which access takes place is called _____.

(A)   Starvation   (B)   Aging

(C)   Race condition   (D)   Data consistency

12.   An operating system follows round-robin scheduling with time quanta of 6 ms. Assuming that the CPU is free now and there are 30 processes waiting in the ready queue, the maximum amount of time that a process waits before getting into the CPU is :

(A)   186 ms   (B)   180 ms

(C)   174 ms   (D)   168 ms

13.   If the waiting time for a process is w and there are n processes in the memory then the CPU utilization is given by :

(A)   w/n

(B) w^n

(C) $n - w^n$

(D) $1 - w^n$

14.   Suppose that a fast wide SCSI-II disk drive spins at 7200 RPM, has sector size of 512 bytes, and holds 160 sectors per track. What is the sustained transfer rate of this drive?

(A)   2400 KB/s   (B)   4800 KB/s

(C)   9600 KB/s   (D)   10800 KB/s

15.   In first order logic, if a set of sentence is _____ then resolution will always be able to derive a contradiction.

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(A)	Unsatisfiable	(B)	Satisfiable
(C)	Conjunction of literals	(D)	Disjunction of literals

16. Hebbian learning is a form of :

(A)	Supervised learning	(B)	Unsupervised learning
(C)	Reinforced learning	(D)	Stochastic learning

17. In reinforcement learning, rather than finding a mapping from states to states, _____ finds a mapping from state / action pairs to values.

(A)	Value function	(B)	Value iteration
(C)	Q-Learning	(D)	Reinforcement function

18. Alpha-beta is guaranteed to compute the same value for the root node as computed by _____ with less or equal computation.

(A)	Breadth First Search	(B)	Minimax
(C)	Depth First search	(D)	Least cost-effective search

19. In Rank-based selection scheme, which of the following is not correct?

(A) The % area to be occupied by an individual i is given by $r_i / \sum_i^n r_i$.

(B) Two or more individuals with the same fitness values should have the same rank.

(C) Individuals are arranged in a descending order of their fitness values.

(D) The proportionate based selection scheme is followed based on the assigned rank.

20. In principal component analysis, the projected lower dimensional space corresponds to _____.

(A) Orthogonal vectors to the original co-ordinate axis

(B) Eigenvectors of the data covariance matrix

(C) Eigenvectors of the data distance matrix

(D) Subset of the original co-ordinate axis

21. A time series prediction problem Is often solved using _____.

(A) Logistic regression

(B) Sinusoidal regression

(C) Auto regression

(D) Quadratic regression

22. Which of the following is not true about DBSCAN algorithm?

(A) It is a density-based clustering algorithm

(B) It requires two parameters MinPts and epsilon

(C) It can generate non-convex cluster shapes

(D) Number of clusters need to be specified in advance

23. Which of the following is not true about K-means clustering algorithm?

(A) The final cluster obtained depends on the choice of initial cluster centres

(B) It is a partitional clustering algorithm

(C) It can generate non-convex cluster shapes.

(D) Number of clusters need to be specified in advance

24. Overfitting in Multilayer neural network is expected when we observe that:

(A) With training iterations, error on both training set and test set decreases

(B) With training iterations, error on both training set and test set increases

(C) With training iterations, error on training set decreases but test set increases

(D) With training iterations, error on training set decreases but test set decreases

25. Distance between two clusters in Single Linkage Clustering is defined as:

(A) Distance between the furthest pair of points between the clusters

(B) Distance between the closest pair of points between the clusters

(C) Distance between the centroids of the two clusters

(D) Distance between the centre of gravity of the two clusters

26. If the hyperplane **w.x**+ b =0 correctly classifies all the training samples (x_i, y_i), where y_i= {-1, +1}, then:

(A) $\|w - 1\| = 2$

(B) **w.x$_i$** + b =0 for all i.

(C) y_i (**w.x$_i$** + b) >=0 for all i.

(D) y_i (**w.x$_i$** + b) <=0 for all i.

27. The purpose of pruning a decision tree is:

(A) Tree balancing

(B) Improving classification accuracy of training set

(C) Dimensionality reduction

(D) Improving generalization performance

28. A store sells 8 items. The maximum possible number of candidate 3-itemsets is:

(A) 8   (B) 17   (C) 56   (D) 255

29. Cohen-Sutherland algorithm is used for :

(A) Line clipping   (B) Point clipping

(C) Fill-area clipping   (D) Both line and Point clipping

30. Transformations required to align View Coordinate with World Coordinate are translation and _____ .

(A) Rotation   (B) Scaling

(C) Shearing   (D) Shifting

31. In _____ projection, the projectors converge to a center of projection at finite distance.

(A) Finite   (B) Distant

(C) Parallel   (D) Perspective

32. Which of the following is not a color model?

(A) RGB   (B) CMY

(C) HSV   (D) YJQ

33. The process of removing objects that lie outside view volume is called :

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(A)   Projection transformation   (B)   Clipping

(B)   Hidden surface detection   (D)   Hidden surface removal

34.   Consider the following two statements:

S_1: Bezier curve allows the local control over the curve surface.

S_2: Polygons are used in Bezier and cubic polynomials in B-spline.

Which one of the following is correct?

(A) S_1 is true and S_2 is false   (B) S_1 is false and S_2 is true

(C)   Both S_1 and S_2 are true   (D)   Both S_1 and S_2 are false

35.   Which among the following is not a subcategory of space partitioning technique?

(A)   Mesh representation   (B)   Octrees

(C)   BSP trees   (D)   Constructive solid geometry

36.   When the intermediate nodes receive a message in full before sending it on to the next node, this is called-

(A)   Store and Forward Switching

(B)   Cut-through Switching

(C)   Store and deferred Forward Switching

(D)   Cut-through and Deferred Switching

37.   Signals that run from 0 up to a maximum frequency are called-

(A)   Channel Band   (B)   Grade Band

(C)   Pass Band   (D)   Base Band

38.   Which one is NOT an example of Error-correcting codes?

(A)   Hamming Code   (B)   Binary Convolution Codes

(C)   Reed-Solomon Codes   (D)   Nyquist Code

39.   In Network layer, a routing algorithm in which every incoming packet is set out on every outgoing line except the one is arrived on is called-

(A)   Flooding protocol   (B)   Distance Vector Protocol

(C)   Link State Protocol   (D)   Intermediate System Protocol

40. In the Internet, the inter-domain routing protocol is called-

(A) Interior Gateway Protocol

(B) Border Gateway Protocol

(C) Virtual Gateway Protocol

(D) Channel Gateway Protocol

41. In transport layer, an example of inverse-multiplexing is-

(A) Chained Buffer Protocol

(B) End-to-End Argument Protocol

(C) Stream Control Transmission Protocol

(D) ARQ Protocol

42. A type of network attack in which an attacker captures a valid network transmission and then retransmit it later, is knows as-

(A) DDoS Attack (B) Replay Attack

(C) Man in the Middle Attack (D) Bucket Brigade Attack

43. In E-R Diagram, in some cases the role name becomes essential for distinguishing the meaning of each participation. Such relationship types are called-

(A) Recursive Relationship (B) Strong Relationship

(C) Weak Relationship (D) Cross Relationship

44. Referential integrity constraint is used to-

(A) Join two tables

(B) maintain constraint integrity

(C) maintain entity integrity

(D) maintain the consistency among tuples in the two relations

45. Constraints that can be specified and entered within the application programs that update the database is called as-

(A) DDL (B) Trigger

(C) VDL (D) Retrievals

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46. A type of query "Retrieve the name of employees who work on all the projects that person 'X' works on" can efficiently be solved by-

    (A)   Project Operation   (B)   Select Operation

    (C)   Union Operation   (D)   Division Operation

47. A functional dependency state that for any two tuples t1 and t2 in relation R-

    (A) $t1[X] = t1[Y] \rightarrow t2[X] = t2[Y]$

    (B) $t1[X] = t2[X] \rightarrow t1[Y] = t2[Y]$

    (C) $t1[X] \neq t2[Y] \rightarrow t2[X] = t1[Y]$

    (D) $t1[X] \neq t2[X] \rightarrow t1[Y] = t2[Y]$

48. The problem when two transactions that access the same database items have their operation interleaved in a way that makes the value of some database items incorrect is called-

    (A)   Incorrect summary problem

    (B)   Cross- referential problem

    (C)   Lost-update problem

    (D)   Dirty-read Problem

49. In database recovery, deferred update can be implemented as-

    (A)   UNDO | NO-REDO   (B)   UNDO| REDO

    (C)   NO-UNDO/NO-REDO   (D)   NO-UNDO | REDO

50. Software Configuration Management process is a part of-

    (A)   Product Engineering Process

    (B)   Development Process

    (C)   Process Management Process

    (D)   Process Improvement Process

51. Which statement is TRUE for Prototyping SDLC model?

    (A)   Exception handling is included in the model.

    (B)   Recovery concept is included in the model.

    (C)   Minimal documentation is done for this model.

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(D)   Test case specification is required for prototyping.

52.   The general effort estimation model is-

$$E_i = a * (KLOC)^b$$

E_i is initial effort in person-month, KLOC is measure of size. The constants a and b are depend on :

(A)   Process Type   (B)   Project type

(C)   Attribute Type   (D)   Development Schedule

53.   Coincidental cohesion occurs when-

(A)   there is no meaningful relationship among the elements of a module

(B)   there is some logical relationship among the elements of a module

(C)   there is some temporal relationship among the elements of a module

(D)   there is some procedural relationship among the elements of a module

54.   A mechanism that can be used to check the correctness of the output of the program for the test case is known as-

(A)   uniqueness testing   (B)   test specification

(C)   test criteria   (D)   test oracle

55.   Beta testing is done-

(A)   within the organization

(B)   in the user's environment

(C)   during software inspection

(D)   during critical design review

56.   Which of the following UML diagram has a static version?

(A)   Collaboration Diagram   (B)   Use case Diagram

(C)   State chart Diagram   (D)   Activity Diagram

57. A web client sends request to a web server. Every retrievable piece of information on the web is identified by-

    (A)   IP address   (B)   Port address

    (C)   URL   (D)   Server location

58. In context of HTML5, what is DTD?

    (A)   Data Type Definition   (B)   Document Type Definition

    (C)   Data Tree Definition   (D)   Document Tree Definition

59. Text . The target attribute specifies where to open the link. By setting it to _blank, you tell the browser to-

    (A)   open it with read only mode

    (B)   open it in mobile device

    (C)   open it from root directory

    (D)   open it in a new tab

60. In Java Script, we use String.fromCharCode() as it is because-

    (A)   It is a dynamic method.

    (B)   It is a static method

    (C)   It uses String () constructor

    (D)   It helps to determine the number of characters

61. In Java Script, which one is slowest loop?

    (A)   while   (B)   DO

    (C)   For   (D)   For-in

62. In AJEX, the XHTMLRequest object provides access to two methods that facilitate connecting to web server. These are :

    (A)   open() and send()   (B)   send() and receive()

    (C)   open() and close()   (D)   send() and close()

63. On the server side, you can use the DOM and PHP in order to-

    (A)   Compose XML and JSON documents

(B)   Manipulate the HTML page

(C)   Create new XML at client side

(D)   Create new JSON at client side

64. Google workspace is an example of-

(A)   Infrastructure as a Service (IAAS)

(B)   Platform as a Service (PASS)

(C)   Function as a service (FAAS)

(D)   Software as a service (SAAS)

65. Grid computing-

(A)   is an approach to computer clustering typically connects some computer nodes via LAN network.

(B)   serve as a main data repository for an IT infrastructure

(C)   is a processor architecture that combines computer resources from different fields to achieve the main purpose.

(D)   create a layer of abstraction over computer hardware

66. Multi-tenancy in cloud computing-

(A)   allows the sharing of some computing resources by different subscribers without the subscribers being aware of it.

(B)   facilitate frequently changing demand of resource for a long number of users

(C)   maintain pools of computing resources to support all users computing need

(D)   provide basic metering function

67. Consumer's control over cloud deployment is minimum in-

(A)   Private cloud environment

(B)   Hybrid cloud environment

(C)   Public cloud environment

(D)   Community cloud environment

68. In Service Oriented Architecture, middleware maintains list of available services-

(A)	in the form of objects	(B)	in the form of metadata
(C)	in the form of registry	(D)	in the form of tables

69. A hosted hypervisor-

   (A) does not have direct access to the hardware resources

   (B) have direct access to hardware resources

   (C) can bypass the host OS

   (D) provide full support to real time OS.

70. In Mandatary Access Control (MAC), access policies are controlled by -

   (A) a central authority

   (B) by the owner of the object

   (C) by user's role

   (D) by user's privileges

71. Which of the following lake of Himachal Pradesh is not matched correctly with its district?

   (A) Kareri - Kangra

   (B) Nako - Lahaul & Spiti

   (C) Suraj Tal - Lahaul & Spiti

   (D) Kalasar - Mandi

72. Which of the following place of Himachal Pradesh is matched correctly with its district?

   (A) Darcha - Kullu

   (B) Chari - Una

   (C) Devi Kothi - Shimla

   (D) Lippa - Kinnaur

73. Identify from among following areas, the correct Sub-Humid tropical Zone, of Himachal Pradesh:

   (A) Parts of Mandi district & Nahan area of Sirmaur district

   (B) Shimla and Kullu districts

(C)   Paonta Sahib area of district Sirmaur, Indora area of Kangra district etc.

(D)   Dharamshala and Palampur areas of Kangra district.

74. The Praino type of marriage of the Khasa tribe of Himachal Pradesh is:

(A)   Marriage arranged by parents

(B)   Love Marriage

(C)   Forcible marriage against brides wishes

(D)   Swayambara type of marriage

75. The Mukhya Mantri Shodh Protsahan Yojana of Himachal Pradesh provides monthly fellowships to those researchers of Government Universities, who do not get any financial assistance. Which of the following amount is correct?

(A)   Rs. 3000 per month   (B)   Rs. 5000 per month

(C)   Rs. 7000 per month   (D)   Rs. 6000 per month

76. Identify from among the following, the correct overall ranking of Himachal Pradesh out of States / Union Territories etc. under Himalayan States category of Export Preparedness Index-2021?

(A)   13th   (B)   20th

(C)   18th   (D)   15th

77. Which of the following Public Sector Banks had the largest number of branches in Himachal Pradesh as of September, 2022?

(A)   State Bank of India   (B)   Punjab National Bank

(C)   UCO Bank   (D)   Central Bank of India

78. Which of the following is correct in Himachal Pradesh:

(A)   The Milk Production is expected to double in 2022-23 over 2021-22.

(B)   The production of eggs in 2022-23 was below 2021-22.

(C)   The Uttam Pashu Puraskar Yojana provides a Rs. 2500 reward per beneficiary per animal

(D)   Fish production has a compounded Annual Growth Rate of 12 percent.

79. Which of the following is the correct percentage of Votes, the Congress got in the State Assembly Election of Himachal Pradesh in 2022?

(A) About 44 percent
(B) About 50 percent
(C) About 51 percent
(D) About 54 percent

80. The European Commission has granted the protected Geographical Indication Status to Himachal Pradesh's product of :

(A) Kinnaur Golden Apples
(B) Kotgarh Apples
(C) Stone fruits of Rajgarh
(D) Kangra Tea

81. Which of the following is correct about the Baijnath Temple in Kangra District of Himachal Pradesh ?

(A) It was built in the 3rd century AD.
(B) It is a Nagara style temple and was built by two local merchants / brothers.
(C) It was built by Raja Gulab Singh of Kashmir.
(D) The shrine is built in Vessara style.

82. The Mahila Vikas Nigam was set up in Himachal Pradesh in :

(A) 1989
(B) 1985
(C) 1993
(D) 1987

83. Identify the correct statement from the following in Himachal Pradesh?

(A) There are only five fine-Arts colleges in the State
(B) Dr. Ambedkar Medhavi Chhatravriti Yojana scholarships are given to Scheduled Castes, Scheduled Tribes and OBC meritorious students of Himachal Pradesh.
(C) Upto 2022, 1430 Scheduled Caste students have been benefitted under Dr. Ambedkar Yojana
(D) 1359 OBC students have been benefitted under Dr. Ambedkar Yojana upto 2022.

84. Which among the following Shimla Hill States was the largest State?

(A) Koti
(B) Bhajji
(C) Theog
(D) Kumarsain

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85. Consider the following about the district Chamba of Himachal Pradesh:

    (i) Sahil Varman, the King of Chamba shifted his capital from Brahmapura (Bharmaur) to Chamba

    (ii) The historical portion of Chamba Vamshavali begins with the name of King Mushan Varman

    (iii) 84 - Yogis are stated to have visited King Meru Varman at Chamba

    (iv) The famous Bhuri Singh Museum at Chamba was inaugurated in 1908:

    Choose the correct answer from the following :

    (A) (i) & (iii)   (B) (i) & (iv)

    (C) (i) & (ii)   (D) (ii) & (iii)

86. Consider the following about India:

    (i) It has 28 States and 08 Union Territories

    (ii) The Eastern and Western Ghats meet at the Southern point of the plateau, formed by the Nilgiri hills

    (iii) The Deccan rivers are perennial like the Northern rivers

    (iv) The Bhagirathi and Alaknanda rivers meet at Rudra Prayag to form the Ganga in Uttarakhand

    Choose the correct answer from the following:

    (A) (i) & (ii)   (B) (ii) & (iii)

    (C) (iii) & (iv)   (D) (iv) & (i)

87. The Sukh-ashraya Sahayata Kosh has been set up by the Government of Himachal Pradesh by keeping a sum of Rupees _____.

    (A) 121 Crore   (B) 111 Crore

    (C) 101 Crore   (D) 151 Crore

88. Which of the following district of Himachal Pradesh has the highest density of population as per 2011 census?

    (A) Bilaspur   (B) Hamirpur

    (C) Kangra   (D) Solan

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89. Which of the following is correct about the Mizoram State Assembly Election, held in November, 2023?

    (A) Congress won 02 seats

    (B) BJP won 01 seat

    (C) M.N.F won 12 seats

    (D) Zoram People's Movement won 27 seats

90. Identify from the following, the names of the countries, whose athletes won the gold and silver medals in Javelin Throw, in the Asian Games 2023.

    (A) Both from India   (B) India & China

    (C) India & South Korea   (D) India & Vietnam

91. Which of the following three districts of Himachal Pradesh have the largest number of MLA seats ?

    (A) Shimla, Hamirpur and Kangra

    (B) Kangra, Mandi and Una

    (C) Kangra, Shimla and Sirmour

    (D) Kangra, Mandi and Shimla

92. The forest and tree cover of Assam covers its total geographical area:

    (A) 50.00 percent   (B) 37.33 percent

    (C) 45.00 percent   (D) 53.40 percent

93. Which of the following Amendment of Indian Constitution has introduced ten per cent reservation for Economically Weaker Sections in Central Government jobs and admission in Central Government run and private educational institutions?

    (A) 106th Amendment Act, 2020.   (B) 105th Amendment Act, 2020.

    (C) 101st Amendment Act, 2018.   (D) 103rd Amendment Act, 2019.

94. The share of European Union in World Population in 2022 was:

    (A) 8.00 percent   (B) 11.10 percent

    (C) 9.78 percent   (D) 7.30 percent

95. The D.P. Sood Commission was appointed in 2011 by the Government of Himachal Pradesh :

    (A)   To look / enquire into the issues relating to benami land deals in the State from 2003 to 2011.

    (B)   To suggest ways and means to strengthen the transport facilities in hilly areas.

    (C)   To report on the irregularities in Panchayat System from 2002 to 2010.

    (D)   To look into electricity facilities in urban and rural areas.

96. Identify from the following, the correct answer of Noble Prize-2023 in Chemistry:

    (A)   It was awarded to two scientists jointly

    (B)   All its recipients are the scientists of USA and Japan.

    (C)   This award is given for discovery and synthesis of quantum dots.

    (D)   It is awarded for the development of a method for genomediting.

97. The owners of which of the following cricket team picked up Renuka Thakur of Himachal Pradesh for the Women Premier League, 2023 ?

    (A)   Delhi Capitals   (B)   Royal Challengers, Bangalore.

    (C)   Mumbai Indians   (D)   Gujarat Giants

98. Which of the following is not a member of the ASEAN?

    (A)   Brunei   (B)   Myanmar

    (C)   Laos   (D)   Sri Lanka

99. Which of the following pair of three countries topped in the Renewable Energy Country Attractiveness Index- 2022?

    (A)   USA, China and India

    (B)   USA, Canada and Australia

    (C)   New Zealand , Germany and Singapore

    (D)   Australia, USA and Germany

100. Identify from the following State Assemblies of USA, which has passed a Resolution condemning the Hinduphobia:

    (A)   Seatle   (B)   Washington DC

    (C)   California   (D)   Georgia

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