

D 144462

(Pages : 13)

Name.....

Reg. No.....

CALICUT UNIVERSITY COMMON ENTRANCE TEST (CU-CET), APRIL 2026

COMPUTER SCIENCE

Time : Two Hours

Maximum : 400 Marks

Each question carries 4 marks.

One mark will be deducted for each wrong answer.

Part I (Computer Science)

1. Which data structure follows the Last-in-First-Out (LIFO) principle ?
 - (a) Stack.
 - (b) Tree.
 - (c) Heap.
 - (d) Graph.
2. What is the time complexity of binary search in a stored array ?
 - (a) $O(n)$.
 - (b) $O(\log n)$.
 - (c) $O(n^2)$.
 - (d) $O(1)$.
3. Which of the following is NOT a programming paradigm ?
 - (a) Object-oriented.
 - (b) Functional.
 - (c) Procedural.
 - (d) Mechanical.
4. Which SQL command is used to remove all records from a table quickly without deleting the table structure ?
 - (a) DELETE.
 - (b) DROP.
 - (c) REMOVE.
 - (d) TRUNCATE.
5. What is the primary function of an operating system ?
 - (a) Manage hardware and Software resources.
 - (b) Compile programs.
 - (c) Design circuits.
 - (d) Create applications.
6. Which type of storage device uses flash memory technology for faster data access compared to traditional magnetic storage ?
 - (a) ROM.
 - (b) RAM.
 - (c) Hard Disk.
 - (d) SSD.

Turn over

7. A compiler translates :
- (a) Machine code to high-level code.
 - (b) High-level code to machine code.
 - (c) Assembly to high-level.
 - (d) Binary to decimal.
8. Which of the following is a NoSQL database ?
- (a) MySQL.
 - (b) Oracle.
 - (c) MongoDB.
 - (d) PostgreSQL.
9. In computer networking, which protocol ensures reliable, connection-oriented communication by performing error checking, flow control, and retransmission of lost packets ?
- (a) Transfer Control Protocol.
 - (b) Transmission Control Protocol.
 - (c) Transport Communication Process.
 - (d) Transmission Core Protocol.
10. In the context of function calls and memory management, which data structure is used to handle nested calls by ensuring that the most recently invoked function is executed first upon return ?
- (a) Queue.
 - (b) Stack.
 - (c) Graph.
 - (d) Heap.
11. In a relational database schema, which attribute or set of attributes uniquely identifies each tuple in a relation while enforcing entity integrity by disallowing duplicate and null values ?
- (a) A duplicate field.
 - (b) A unique identifier.
 - (c) A foreign key.
 - (d) A null field.
12. Which of the following statements most rigorously characterizes the necessary conditions for the occurrence of a deadlock in an operating system, as formalized by the Coffman conditions ?
- (a) Deadlock arises solely due to mutual exclusion when multiple processes compete for non-shareable resources.
 - (b) Deadlock occurs only when circular wait exists among processes requesting resources.

- (c) Deadlock can occur only if pre-emption is disallowed but does not depend on resource holding.
- (d) Deadlock arises when mutual exclusion, hold-and-wait, no pre-emption, and circular wait simultaneously hold.
13. Which sorting algorithm has best average-case performance ?
- (a) Bubble sort. (b) Selection sort.
- (c) Quick sort. (d) Insertion sort.
14. What is the role of DNS ?
- (a) Convert IP to MAC. (b) Convert domain name to IP.
- (c) Encrypt data. (d) Compress files.
15. Which of the following best describes the primary role of HTML in web development ?
- (a) Executing application logic on the client side.
- (b) Defining the structural layout and content of web pages.
- (c) Managing and querying relational databases.
- (d) Handling data communication between networked systems.
16. In the OSI model, which layer is responsible for end-to-end data delivery, including error detection and flow control ?
- (a) Network layer. (b) Transport layer.
- (c) Data Link layer. (d) Session layer.
17. Python is an example of :
- (a) Compiled language. (b) Interpreted language.
- (c) Assembly language. (d) Machine language.
18. Cache memory is used to :
- (a) Store permanent data. (b) Increase processing speed.
- (c) Replace RAM. (d) Backup data.
19. Cloud computing provides :
- (a) Storage. (b) Processing power.
- (c) Networking. (d) All of the above.
20. Java is mainly :
- (a) Procedural. (b) Object-oriented.
- (c) Functional. (d) Assembly-based.

21. Which of the following problems in NP-complete ?
(a) Sorting. (b) Searching.
(c) Travelling Salesman Problem. (d) Binary Search.
22. What is the worst-case time complexity of Quick Sort ?
(a) $O(n \log n)$. (b) $O(n^2)$.
(c) $O(\log n)$. (d) $O(n)$.
23. In a B-tree of order m , the maximum number of children is :
(a) $m - 1$. (b) m .
(c) $m + 2$. (d) $2m$.
24. Which scheduling algorithm may cause starvation ?
(a) FCFS. (b) Round Robin.
(c) Priority Scheduling. (d) FIFO.
25. Which of the following statements best justifies why the height of a height-balanced binary tree remains logarithmic in terms of the number of nodes ?
(a) Because each node has at most two children.
(b) Because the tree avoids skewness by maintaining near-equal subtree heights at every node.
(c) Because nodes are inserted in sorted order.
(d) Because the root always has two children.
26. Which protocol is used for secure web browsing ?
(a) HTTP. (b) FTP.
(c) HTTPS. (d) SMTP.
27. What is recursion ?
(a) Looping. (b) Function calling itself.
(c) Sorting method. (d) Data structure.
28. Which of the following data structures organizes elements in a hierarchical manner with parent-child relationships, rather than sequentially ?
(a) Array. (b) Linked List.
(c) Stack. (d) Tree.
29. What does an API do ?
(a) Stores data. (b) Provides interface for interaction.
(c) Compiles code. (d) Debugs programs.

30. Which algorithm is used to find the shortest path in a weighted graph without negative edges ?
- (a) BFS. (b) DFS.
(c) Dijkstra's Algorithm. (d) Kruskal's Algorithm.
31. What is the main function of the kernel in an operating system ?
- (a) To compile programs.
(b) To manage hardware resources and system cells.
(c) To design user interfaces. (d) To store files permanently.
32. Which paradigm ensures immutable, consensus-validated transactions in a decentralized peer-to-peer network without a central authority ?
- (a) Edge computing. (b) Blockchain Technology.
(c) Client-Server Model. (d) Distributed File System.
33. What is JSON primarily used for ?
- (a) Database storage. (b) Program execution.
(c) Data interchange format. (d) Image processing.
34. Which programming construct is used to execute a block of code repeatedly ?
- (a) Condition. (b) Loop.
(c) Class. (d) Variable.
35. When does a compiler error occur ?
- (a) During program execution. (b) Before execution during compilation.
(c) After program termination. (d) During debugging only.
36. What is the purpose of an IP address ?
- (a) Identify a user name. (b) Identify a website design.
(c) Identify a device on a network. (d) Store data.
37. What is blockchain technology mainly known for ?
- (a) Centralized storage. (b) Distributed and secure ledger system.
(c) Fast computation only. (d) Image rendering.
38. What is UML primarily used for in software engineering ?
- (a) Coding programs. (b) Modeling and designing systems.
(c) Testing software. (d) Debugging errors.

Turn over

39. What does SaaS stand for ?
- (a) System as a Service.
 - (b) Software as a Service.
 - (c) Storage as a System.
 - (d) Security as a Service.
40. In training deep neural networks, which technique helps mitigate the vanishing gradient problem by allowing gradients to flow more effectively through deep layers via identity mappings ?
- (a) Dropout.
 - (b) Batch normalization.
 - (c) Residual Connections (Skip connections).
 - (d) Max Pooling.
41. What is the primary goal of data mining ?
- (a) Store large data.
 - (b) Extract useful patterns from data.
 - (c) Delete unwanted data.
 - (d) Encrypt data.
42. What does encryption ensure in data communication ?
- (a) Speed.
 - (b) Security and confidentiality.
 - (c) Data loss.
 - (d) Data redundancy.
43. What does a pointer variable store ?
- (a) Data value.
 - (b) Instruction.
 - (c) Memory address.
 - (d) File name.
44. What is debugging in programming ?
- (a) Writing code.
 - (b) Compiling code.
 - (c) Identifying and fixing errors.
 - (d) Executing programs.
45. In classification problems, which evaluation metric is most appropriate when dealing with highly imbalanced datasets, where one class significantly outnumbers the other ?
- (a) Accuracy.
 - (b) Precision.
 - (c) Recall.
 - (d) F1-score.
46. What is produced by a compiler after successful compilation ?
- (a) Source code.
 - (b) Object code.
 - (c) High-level code.
 - (d) Pseudo code.

47. Which of the following statements most accurately characterizes the disciplinary relationship of Machine Learning within modern computational sciences ?
- (a) It is a fundamental concept limited to data organization in data structures.
 - (b) It is a specialized subset of Artificial Intelligence focused on enabling systems to learn from data without explicit programming.
 - (c) It is primarily concerned with the design and management of communication protocols in networking.
 - (d) It exclusively deals with structured data storage and retrieval in database systems.
48. What is the main function of a firewall ?
- (a) Increase speed.
 - (b) Provide security by filtering traffic.
 - (c) Provide security by filtering traffic.
 - (d) Process data.
49. How is data stored in a linked list ?
- (a) Contiguously in memory.
 - (b) Randomly in registers.
 - (c) Non-contiguously with pointers.
 - (d) Only in Cache.
50. What does Big-O notation represent in algorithm analysis ?
- (a) Exact running time.
 - (b) Lower bound of complexity.
 - (c) Upper bound on time/space complexity.
 - (d) Memory allocation only.

Part II (a) Electronics

51. Ohm's law states :
- (a) $V = IR$.
 - (b) $P = VI$.
 - (c) $I = V/R^2$.
 - (d) $V = I^2R$.
52. A diode allows current to flow in :
- (a) Both directions.
 - (b) One direction.
 - (c) No direction.
 - (d) Alternate direction.

Turn over

53. A transistor is used as :
- (a) Switch.
 - (b) Amplifier.
 - (c) Oscillator.
 - (d) All of the above.
54. Capacitor stores :
- (a) Charge.
 - (b) Energy only.
 - (c) Resistance.
 - (d) Voltage.
55. In an electric circuit, what is the primary effect of a capacitor when connected across a varying voltage source ?
- (a) It stores electric charge.
 - (b) It opposes changes in voltage.
 - (c) It increases current flow.
 - (d) It generates energy.
56. What is the cut-off frequency of an RC circuit ?
- (a) $1/RC$.
 - (b) $1/(2\pi RC)$
 - (c) RC .
 - (d) $2\pi RC$.
57. Silicon has how many valence electrons ?
- (a) 2.
 - (b) 8.
 - (c) 4.
 - (d) 5.
58. Amplifier increases :
- (a) Frequency.
 - (b) Signal strength.
 - (c) Resistance.
 - (d) Voltage only.
59. Oscillator generates :
- (a) DC signal.
 - (b) AC signal.
 - (c) Random signal.
 - (d) Noise.
60. Logic AND gate output is 1 when :
- (a) Any input is 1.
 - (b) Both inputs are 1.
 - (c) Both inputs are 0.
 - (d) One input is 0.

(b) Physics

61. SI unit of force :
- (a) Joule.
 - (b) Newton.
 - (c) Watt.
 - (d) Pascal.
62. Newton's second law :
- (a) $F = ma$.
 - (b) $E = mc^2$.
 - (c) $V = IR$.
 - (d) $P = IV$.

63. Speed of light is :
(a) 3×10^8 m/s. (b) 3×10^6 m/s.
(c) 3×10^5 km/s. (d) Both (a) and (c).
64. Energy unit is :
(a) Watt. (b) Joule.
(c) Volt. (d) Ampere.
65. Work done formula :
(a) $W = Fd$. (b) $W = ma$.
(c) $W = Pt$. (d) $W = VI$.
66. Gravitational force depends on :
(a) Mass. (b) Distance.
(c) Gravitational constant. (d) All of the above.
67. Power unit is :
(a) Joule. (b) Watt.
(c) Newton. (d) Volt.
68. Momentum is :
(a) mv^2 . (b) mv .
(c) ma . (d) m/a .
69. Frequency unit :
(a) Volt. (b) Hertz.
(c) Ohm. (d) Tesla.
70. Acceleration due to gravity is approximately :
(a) 9.8 m/s^2 (b) 8.9 m/s^2
(c) 10 m/s^2 (d) 9 m/s^2

(c) Mathematics

71. Derivative of x^2 is :
(a) x . (b) $2x$.
(c) x^2 . (d) 1.
72. $\int (1/x) dx$ equals :
(a) x . (b) $\ln |x|$.
(c) x^2 . (d) e^x .

Turn over

73. Determinant of matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is :
- (a) $ad - bc$. (b) $ab + cd$.
(c) $ac - bd$. (d) $ad + bc$.
74. Probability value lies between :
- (a) -1 to 1 . (b) 0 to 1 .
(c) 1 to 10 . (d) 0 to ∞ .
75. Identify : $\sin^2\theta + \cos^2\theta =$
- (a) 1 . (b) 0 .
(c) 2 . (d) θ .
76. Eigenvalues are associated with :
- (a) Scalars. (b) Matrices.
(c) Vectors only. (d) Functions.
77. Limit of constant function is :
- (a) 0 . (b) Constant.
(c) ∞ . (d) Undefined.
78. $\log_{10}(100) =$
- (a) 1 . (b) 2 .
(c) 10 . (d) 100 .
79. Magnitude of vector (x, y) is :
- (a) $x + y$. (b) $\sqrt{x^2 + y^2}$.
(c) $x^2 + y^2$. (d) xy .
80. A complex number is written as :
- (a) x/y . (b) $a + bi$.
(c) $\log x$. (d) e^x .

(D) Statistics

81. Which of the following best describes the concept of a sampling distribution ?
- (a) Distribution of raw data values.
(b) Distribution of a sample statistic over repeated samples.
(c) Distribution of population parameters.
(d) Distribution of measurement errors.

82. In hypothesis testing, what does a p -value represent ?
- (a) Probability that the null hypothesis is true.
 - (b) Probability of observing data as extreme as the sample, assuming the null hypothesis is true.
 - (c) Probability of accepting the alternative hypothesis.
 - (d) Level of significance of the test.
83. Which measure is most affected by extreme values (outliers) ?
- (a) Median.
 - (b) Mode.
 - (c) Mean.
 - (d) Quartiles.
84. What is the primary purpose of confidence intervals ?
- (a) To test hypotheses.
 - (b) To estimate a range for population parameters.
 - (c) To eliminate sampling error.
 - (d) To classify data.
85. Which distribution is characterized by its bell-shaped curve and symmetry ?
- (a) Binomial distribution.
 - (b) Poisson distribution.
 - (c) Normal distribution.
 - (d) Uniform distribution.
86. What does a Type I error refer to ?
- (a) Accepting a false null hypothesis.
 - (b) Rejecting a true null hypothesis.
 - (c) Accepting a true alternative hypothesis.
 - (d) Rejecting a false alternative hypothesis.
87. Which statistical measure indicates the strength and direction of a linear relationship between two variables ?
- (a) Variance.
 - (b) Standard deviation.
 - (c) Correlation coefficient.
 - (d) Skewness.
88. In regression analysis, what does the coefficient of determination (R^2) indicate ?
- (a) Strength of causation.
 - (b) Proportion of variance explained by the model.
 - (c) Number of predictors in the model.
 - (d) Error in prediction.

Turn over

89. Which sampling method ensures every member of the population has an equal chance of selection ?
- (a) Stratified sampling. (b) Systematic sampling.
(c) Convenience sampling. (d) Simple random sampling.
90. What is the main assumption of parametric tests ?
- (a) Data must be categorical.
(b) Data must follow a specific distribution (usually normal).
(c) Sample size must be small.
(d) Variables must be independent only.

(e) Chemistry

91. Atomic number represents :
- (a) Neutrons. (b) Protons.
(c) Electrons + Neutrons. (d) Mass.
92. pH less than 7 indicates :
- (a) Acid. (b) Base.
(c) Neutral. (d) Salt.
93. Avogadro number is :
- (a) 6.022×10^{23} . (b) 3×10^8 .
(c) 1.6×10^{-19} . (d) 9.8.
94. Covalent bond involves :
- (a) Transfer of electrons. (b) Sharing of electrons.
(c) Loss of protons. (d) Gain of neutrons.
95. Periodic table is arranged by :
- (a) Mass. (b) Atomic number.
(c) Density. (d) Volume.
96. Oxidation involves :
- (a) Gain of electrons. (b) Loss of electrons.
(c) Gain of neutrons. (d) Loss of protons.
97. Ideal gas equation is :
- (a) $PV = nRT$. (b) $V = IR$.
(c) $E = mc^2$. (d) $F = ma$.

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98. Catalyst function is to :

- (a) Stop reaction.
- (b) Slow reaction.
- (c) Speed up reaction.
- (d) Change products.

99. Isotopes differ in :

- (a) Protons.
- (b) Electrons.
- (c) Neutrons.
- (d) Atomic number.

100. Which of the following statements most accurately explains the molecular structure and bonding characteristics of water ?

- (a) Water consists of two hydrogen atoms linearly bonded to oxygen with no polarity.
- (b) Water has a bent molecular geometry due to lone pair repulsion on oxygen, resulting in a polar molecule.
- (c) Water is a nonpolar molecule with symmetrical charge distribution.
- (d) Water forms only ionic bonds between hydrogen and oxygen atoms.

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APRIL 2025

M.Sc. COMPUTER SCIENCE

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Part I

Computer Science

1. Row of a table in DBMS is also called as _____.
(a) Column. (b) Record.
(c) Field. (d) Tuple.
2. What is termed to maintain the data integrity and enforcing the data security ?
(a) User Address. (b) User Annotation.
(c) User Administration. (d) User Retrieval.
3. When a program is executed, the _____ Interacted by sending a message to one another.
(a) Objects. (b) Memory.
(c) Operating System. (d) Kernel.
4. Which language among the following support an Object Oriented approach ?
(a) Ada 95. (b) Modula-3.
(c) Modula-2. (d) Both (A) and (B).
5. A JK flip-flop in the toggle mode has :
(a) $K = 1$ and $J = 0$. (b) $K = 1$ and $J = 1$.
(c) $K = 0$ and $J = 1$. (d) $K = 0$ and $J = 0$.

Turn over

6. Out of these logic families, which one provides the minimum dissipation of power ?
- (a) TTL.
 - (b) CMOS.
 - (c) JFET.
 - (d) ECL.
7. At what frequency can we apply the digital data to a gate ?
- (a) Propagation Frequency.
 - (b) Operating Frequency.
 - (c) Run-time Frequency.
 - (d) AC Frequency.
8. If a page number is not found in the translation lookaside buffer, then it is known as a _____.
- (a) Translation Lookaside Buffer miss.
 - (b) Translation Lookaside Buffer hit.
 - (c) Buffer miss.
 - (d) All of the mentioned.
9. Who among the following can block the running process ?
- (a) Down.
 - (b) Read.
 - (c) Fork.
 - (d) All of these.
10. What is the use of directory structure in an Operating System ?
- (a) It is used to store the program in file format.
 - (b) It is used to solve the problem of the network connection in the Operating System.
 - (c) It is used to store files and folders hierarchically.
 - (d) All of the above.
11. Which of the following method is used to prevent threads or processes from accessing a single resourcee ?
- (a) PCB
 - (b) Job Scheduler.
 - (c) Semaphores.
 - (d) Non-contiguous Memory Allocation.

12. Which of the following is a valid long literal ?

- (a) ABH8097.
- (b) L990023.
- (c) 904423.
- (d) 0xnf029L.

13. Evaluate the following Java expression, if $x = 3$, $y = 5$, and $z = 10$:

$++z + y - y + z + x++$

- (a) 23.
- (b) 28.
- (c) 21.
- (d) 25.

14. An interface with no fields or methods is known as a _____.

- (a) Runnable Interface.
- (b) Marker Interface.
- (c) Abstract Interface.
- (d) CharSequence Interface

15. What is meant by the classes and objects that dependents on each other ?

- (a) Tight Coupling.
- (b) Cohesion.
- (c) Loose Coupling.
- (d) None of the above.

16. What will be the output of the following C code ?

```
#include <stdio.h>

int main(){
    int a = 11;
    while (a < 20) {
        printf("%d ", a);
        a += 2;
    }
    return 0;
}
```

- (a) 11 13 15 17 19 21.
- (b) 11 12 13 14 15 16 17 18 19 20.
- (c) 11 13 15 17 19.
- (d) None of these.

Turn over

17. What is the correct syntax to declare pointer to pointer i.e., double pointer ?
- (a) Type **pointer_name ; (b) Type *&pointer_name ;
(c) Type *(*pointer_name) ; (c) Type ** (pointer_name) ;
18. What will happen if a header file is included in a program twice ?
- (a) Program will throw an error.
(b) Program will throw an exception.
(c) Program will run as it is.
(d) None of these.
19. Which of the following is an incorrect call to the function void sample (int a, int b=0, int c=0) ?
- (a) Sample(1, 2, 3) ; (b) Sample() ;
(c) Sample (5) ; (d) Sample(3,4) ;
20. Which of the following function is used to get the dimensions of the given array ?
- (a) Getdimension. (b) Getarraydimension.
(c) Arrayrank. (d) Rank.
21. If we did not create any constructor in the class, then which of the following constructor is automatically added to the class ?
- (a) Copy constructor. (b) Default constructor.
(c) Parameterized constructor. (d) None of the above.
22. Which of the following algorithms is not used in asymmetric-key cryptography ?
- (a) RSA algorithm. (b) Diffie-Hellman algorithm.
(c) Electronic code book algorithm. (d) None of the mentioned.

23. Which of the following statement is true about error detection techniques used on communications link ?
- (a) Cyclic Redundancy Check (CRC) sequence can detect as well as correct errors.
 - (b) Error detection cannot be used on simplex links.
 - (c) Hamming code can detect up to 3-bit errors.
 - (d) All of the these.
24. POTS network works on the principle of :
- (a) Telephone switching.
 - (b) Proxy server.
 - (c) File system.
 - (d) Circuit system.
25. What network utility uses the time-To-Live (TTL) field in the IP header to elicit ICMP error messages ?
- (a) Ping.
 - (b) Route.
 - (c) Traceroute.
 - (d) Ifconfig.
26. What is the maximum data transfer rate of the ISDN ?
- (a) 1024 Mbps.
 - (b) 128 Mbps.
 - (c) 64 kbps.
 - (d) 1024 kbps.
27. Which of the following statements is correct about IRC ?
- (a) It sends the messages in virtual time.
 - (b) It is an application layer protocol.
 - (c) It works on the proxy model.
 - (d) All of the these.
28. How to create a hyperlink in HTML ?
- (a) `<a link = "www.thinkandlearn.com"> thinkandlearn.com </a>.`
 - (b) `<a> www.thinkandlearn.com <thinkandlearn.com /a>.`
 - (c) `<a href = "www.thinkandlearn.com"> thinkandlearn.com </a>.`
 - (d) `<a url = "www.thinkandlearn.com" thinkandlearn.com /a>.`

Turn over

29. What attribute do we use for data binding ?
- (a) Name.
 - (b) Mayscript.
 - (c) Datasrc.
 - (d) Datafld.
30. Which one of these helps us test if an old browser supports the geolocation ?
- (a) Modernizr.geolocation.
 - (b) Modernizr.
 - (c) Modernizr.js.
 - (d) Navigator.userAgent.
31. Who developed the Python language ?
- (a) Zim Den.
 - (b) Guido van Rossum.
 - (c) Niene Stom.
 - (d) Wick van Rossum.
32. PVM is often called _____.
- (a) Python interpreter.
 - (b) Python assembler.
 - (c) Python volatile machine.
 - (d) Portable virtual machine.
33. The external system bus architecture is created using from _____ architecture :
- (a) Pascal.
 - (b) Dennis Ritchie.
 - (c) Charles Babbage.
 - (d) Von Neumann.
34. The size of each segment in 8086 is :
- (a) 64 kb.
 - (b) 22 kb.
 - (c) 52 kb.
 - (d) 8 kb.
35. DIP stand for :
- (a) Deal in-line package.
 - (b) Dual in-line package.
 - (c) Direct in-line package.
 - (d) Digital in-line package.
36. Which causes the microprocessor to immediately terminate its present activity :
- (a) RESET signal.
 - (b) INTERRUPT signal.
 - (c) Both.
 - (d) None of these.

37. SDRAM refers to :
- (a) Sequential DRAM.
 - (b) Synchronous DRAM.
 - (c) Static DRAM.
 - (d) Semi DRAM.
38. Conversion of the +1000 decimal number into signed binary word results.
- (a) 0000 0011 1110 1000.
 - (b) 1111 1100 0001 1000.
 - (c) 1000 0011 1110 1000.
 - (d) 0111 1100 0001 1000.
39. Direction flag is used with
- (a) String instructions.
 - (b) Stack instructions.
 - (c) Branch instructions.
 - (d) Arithmetic instructions.
40. Which of the following prototypes does not associated with Prototyping Model ?
- (a) Domain Prototype.
 - (b) Vertical Prototype.
 - (c) Horizontal Prototype.
 - (d) Diagonal Prototype.
41. _____ is not considered as an activity of Structured Analysis (SA).
- (a) Transformation of a textual problem description into a graphic model.
 - (b) Functional decomposition.
 - (c) All the functions represented in the DFD are mapped to a module structure.
 - (d) All of the mentioned.
42. Which parameters are essentially used while computing the software development cost ?
- (a) Hardware and Software Costs.
 - (b) Effort Costs.
 - (c) Travel and Training Costs.
 - (d) All of the above.

Turn over

43. Once the requirements are stabilized, the basic architecture of the software can be established. Which of the following version of the COCOMO model conforms to the given statement ?
- (a) Application composition model.
 - (b) Post-architecture-stage model.
 - (c) Early design state model.
 - (d) All of the above.
44. What does RAD stand for ?
- (a) Rapid Application Document.
 - (b) Rapid Application Development.
 - (c) Relative Application Development.
 - (d) None of the above.
45. Which one of the following is a sequence of statements from one place in the program to another ?
- (a) Gateway.
 - (b) Route.
 - (c) Both (A) and (B).
 - (d) Sub-path.
46. What is an abbreviation of MTTF...
- (a) Mean-time-to-function.
 - (b) Manufacture-time-to-function.
 - (c) Mean-time-to-failure.
 - (d) None of the mentioned.
47. Bugs and failures in the software are due to ?
- (a) Software Developers.
 - (b) Software companies.
 - (c) None of these.
 - (d) Both (a) and (b).

48. Which of the following statement is false ?
- (a) Web-based system should be developed and delivered incrementally.
 - (b) Web brings the concept of software as service.
 - (c) Web-based systems have led to degradation of programming languages.
 - (d) The web has led to the availability of software services and the possibility of developing highly distributed service-based systems.
49. Which of the following models doesn't necessitate defining requirements at the earliest in the lifecycle ?
- (a) RAD and Waterfall.
 - (b) Prototyping and Waterfall.
 - (c) Spiral and Prototyping.
 - (d) Spiral and RAD.
50. The process of developing a software product using software engineering principles and methods is referred to as :
- (a) Software Engineering.
 - (b) Software Evolution.
 - (c) System Models.
 - (d) Software Models.

Part II

(a) *Electronics*

51. At room temperature the current in an intrinsic semiconductor is due to :
- (a) Holes.
 - (b) Electrons.
 - (c) Ions.
 - (d) Holes and electrons.
52. Voltage series feedback (Also called series-shunt feedback) results :
- (a) Increase in both I/P and O/P impedances.
 - (b) Decrease in both I/P and O/P impedances.
 - (c) Increase in I/P impedance and decrease in O/P impedance.
 - (d) Decrease in I/P impedance and increase in O/P impedance.

Turn over

53. How many free electrons does a p type semiconductor has ?
- (a) Only those produced by thermal energy.
 - (b) Only those produced by doping.
 - (c) Those produced by doping as well as thermal energy.
 - (d) Any of the above.
54. An electron in the conduction band :
- (a) Has higher energy than the electron in the valence band.
 - (b) Has lower energy than the electron in the valence band.
 - (c) Loses its charge easily.
 - (d) Jumps to the top of the crystal.
55. The dynamic resistance of a forward biased p - n diode :
- (a) Varies inversely with current.
 - (b) Varies directly with current.
 - (c) Is constant.
 - (d) Is either constant or varies directly with current.
56. For a NPN bipolar transistor, what is the main stream of current in the base region ?
- (a) Drift of electrons.
 - (b) Drift of holes.
 - (c) Diffusion of electrons.
 - (d) Diffusion of holes.
57. The dynamic resistance of a forward biased p - n diode :
- (a) Varies inversely with current
 - (b) Is either constant or varies directly with current
 - (c) Is constant.
 - (d) Varies directly with current.

58. In a half wave rectifier, the load current flows :

- (a) For full cycle.
- (b) Only for the positive half cycle of the input signal.
- (c) Only for the negative half cycle of the input signal.
- (d) For less than fourth cycle.

59. If too large current passes through the diode :

- (a) All holes will freeze.
- (b) All electrons will leave.
- (c) Diode will emit light.
- (d) Excessive heat may damage the diode.

63. In grand-canonical ensemble the expression for probability distribution is :
- (a) $\rho(E) = e[\Omega + n\mu - EkT]$. (b) $\rho(E) = e[\Omega + n - \mu EkT]$.
(c) $\rho(E) = e[\Omega + n - E\mu kT]$. (d) $\rho(E) = e[\Omega\mu + n - EkT]$.
64. Microcanonical ensemble is a collection of essentially independent systems having :
- (a) Same temperature, volume and no of identical particles.
(b) Same energy, volume and no of particles.
(c) Same temperature, volume and chemical potential.
(d) None of these.
65. If the mass of a particle is zero its speed must be :
- (a) c . (b) Infinite.
(c) 0. (d) Any speed less than c .
66. According to relativity theory a particle of mass m with a momentum of $2mc$ has a speed of :
- (a) $2c$. (b) $4c$.
(c) c . (d) $0.89c$.
67. The motion of a wave packet is similar to :
- (a) Photons. (b) Waves.
(c) Classical particle. (d) Quantum particle.
68. If kinetic energy of electron doubles, its de-Broglie wavelength changes by a factor :
- (a) 0.5. (b) 3.
(c) 2. (d) 0.707.
69. If a glass prism is dipped in water, what happens to its dispersive power ?
- (a) Increases. (b) Decreases.
(c) Does not change. (d) No effect.

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60. When diodes are connected in series to increase voltage rating the peak inverse voltage per junction :

- (a) Should not exceed one third the breakdown voltage.
- (b) May be equal to or less than breakdown voltage.
- (c) Should not exceed the breakdown voltage.
- (d) Should not exceed half the breakdown voltage.

(b) *Physics*

61. An ideal Carnot engine extracts 100J from a heat source and dumps 40J to a heat sink at 300K. The temperature of the heat source is :

- (a) 600K.
- (b) 750K.
- (c) 700K.
- (d) 650K.

62. Fermions have spin value :

- (a) $\frac{1}{2}$.
- (b) 1.
- (c) 0.
- (d) Any one.

Turn over

63. In grand-canonical ensemble the expression for probability distribution is :

- (a) $\rho(E) = e[\Omega + n\mu - EkT]$. (b) $\rho(E) = e[\Omega + n - \mu EkT]$.
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(c) Does not change. (d) No effect.

70. A convex lens is dipped in a liquid whose refractive index is equal to the refractive index of the lens. Then what is its focal length ?

- (a) Focal Length will become zero.
- (b) Focal Length will become infinite.
- (c) Focal length will reduce, but not become zero.
- (d) Remains unchanged.

(c) Mathematics

71. The Newton Raphson method is also called as _____.

- (a) Tangent method.
- (b) Secant method.
- (c) Chord method.
- (d) Diameter method.

72. The equation $f(x)$ is given as $x^3 + 4x + 1 = 0$. Considering the initial approximation at $x = 1$ then the value of x_1 is given as _____.

- (a) 1.6712.
- (b) 0.1856.
- (c) 0.1429.
- (d) 1.8523.

73. If each element of a line consists of m terms, the determinant can be expressed as the sum of _____ determinants.

- (a) $m - 1$.
- (b) m .
- (c) $m + 1$.
- (d) m^2 .

74. Find the positive root of the equation $3x + \sin x - e^x$ using Regula Falsi method and correct upto 4 decimal places.

- (a) 0.4604.
- (b) 0.4306.
- (c) 0.3604.
- (d) 0.4304.

Turn over

75. Which of the following option is correct when addition of two matrices A and B is possible ?
- (a) both are rectangular
 - (b) both have same order
 - (c) no of columns of A is equal to columns of B
 - (d) no of rows of A is equal to no of columns of B
76. What do we call the matrices obtained by changing rows and columns ?
- (a) Rectangular matrix.
 - (b) Transpose.
 - (c) Symmetric.
 - (d) Scalar
77. Objective function of an LP problem is :
- (a) A constant.
 - (b) A function to be optimized.
 - (c) A quadratic equation.
 - (d) An inequality.
78. Corner points of the bounded feasible region for an LP problem are (0, 4), (6, 0), (12, 0), (12, 16) and (0, 10). Let $z = 8x + 12y$ be the objective function. Match the following : (i) Minimum value of z occurs at _____ (ii) Maximum value of z occurs at _____ (iii) Maximum of z is ; (iv) Minimum of z is _____.
- (a) (i) (6, 0) (ii) (12, 0) (iii) 288 (iv) 48.
 - (b) (i) (0, 4) (ii) (12, 16) (iii) 288 (iv) 48.
 - (c) (i) (0, 4) (ii) (12, 16) (iii) 288 (iv) 96.
 - (d) (i) (6, 0) (ii) (12, 0) (iii) 288 (iv) 96.
79. If $f(z)$ is an analytic function whose real part is constant then $f(z)$ is :
- (a) Function of z .
 - (b) Function of x only.
 - (c) Function of y only.
 - (d) Fonstant.
80. A function which is analytic everywhere in a complex plane is known as :
- (a) Harmonic function.
 - (b) Differentiable function.
 - (c) Regular function.
 - (d) Entire function.

(d) Statistics.

81. A _____ has rows / column having non- basic cells for holding compensating (+)or (-) sign.
- (a) Cycle. (b) Dead - end.
- (c) Back track. (d) None of the above.
82. After determining every basic cell with in this cycle, adjustment is obtained as minimum value in basic cells . this is known as _____.
- (a) Adjustment amount. (b) aa.
- (c) Both (a) and (b). (d) Alternatives.
83. If E denotes the expectation the variance of a random variable X is denoted as ?
- (a) $(E(X))^2$. (b) $E(X^2) - (E(X))^2$.
- (c) $E(X^2)$. (d) $2E(X)$.
84. The random variables X and Y have variances 0.2 and 0.5 respectively. Let $Z = 5X - 2Y$. The variance of Z is ?
- (a) 3. (b) 4.
- (c) 5. (d) 7.
85. The probability of rejecting the null hypothesis when it is true is called :
- (a) Level of confidence. (b) Power of the test.
- (c) Level of significance. (d) Difficult to tell.
86. The number of independent values in a set of values is called _____.
- (a) Test statistic. (b) Level of freedom.
- (c) Degree of freedom. (d) Level of confidence.
87. What is the probability of committing a type I error ?
- (a) Effect size. (b) Power
- (c) Significance level. (d) Confidence level.

Turn over

88. Which of the following statements is correct ?
- (a) The direct oral investigation is a method for the collection of secondary data.
 - (b) The direct personal investigation is a method for the collection of secondary data.
 - (c) The collection of information through a questionnaire is a method for the gathering of secondary data.
 - (d) None of the above.
89. Which of the following statements about statistics is accurate ?
- (a) In a singular sense, statistics is a statistical law.
 - (b) In a singular sense, statistics is a statistical science.
 - (c) Both (a) and (b) are incorrect.
 - (d) Both (a) and (b) are correct.
90. Stochastic processes are :
- (a) Strict sense stationary process.
 - (b) Wide sense stationary process.
 - (c) All of the mentioned.
 - (d) None of the mentioned.
- (e) Chemistry
91. Bio diesel is produced by the _____ of the vegetable oil.
- (a) Fermentation.
 - (b) Distillation.
 - (c) Transesterification.
 - (d) Rectification.
92. The hydrogen-oxygen fuel cells have electrolyte solution of 2.5 % :
- (a) KOH.
 - (b) NaOH.
 - (c) $\text{Na}(\text{OH})_2$.
 - (d) $\text{Mg}(\text{OH})_2$.

93. The state of freezing involves :

- (a) Loss of kinetic energy.
- (b) Increased force of attraction.
- (c) Liquid solidifies.
- (d) All of above.

94. In the reaction $2A + B \rightarrow A_2B$, if the concentration of A is doubled and that of B is halved, then the rate of the reaction will :

- (a) Increase 2 times.
- (b) Increase 4 times.
- (c) Decrease 2 times.
- (d) Remain the same.

95. What is the value of gamma for gas if the pressure of the gas is proportional to the T^3 for adiabatic process ?

- (a) 2.
- (b) $3/2$.
- (c) $4/3$.
- (d) $5/3$.

96. Find the incorrect statement :

- (a) BOD value of clean water is less than 5 ppm.
- (b) Drinking water pH should be between 5.5-9.5.
- (c) carbon, sulphur and nitrogen oxides are the most widespread air pollutants.
- (d) dissolved oxygen concentration below 5 ppm is ideal for the growth of fish.

97. In the air, N_2 and O_2 occur naturally but they do not react to form oxides of nitrogen because :

- (a) Oxides of nitrogen are unstable.
- (b) Catalyst is required for the reaction.
- (c) The reaction is endothermic.
- (d) N_2 and O_2 do not react with each other.

Turn over

98. What will be the work done by 3 moles of an ideal gas when it expands spontaneously in a vacuum ?

- (a) Zero. (b) Infinite.
(c) 3 joules. (d) 9 joules.

99. A gas X has C_p and C_v ratio as 1.4, at NTP 11.2 L of gas X will contain number of atoms _____.

- (a) 1.2×10^{23} . (b) 3.01×10^{23} .
(c) 2.01×10^{23} . (d) 6.02×10^{23} .

100. Find the pair with sp^2 hybridisation of the central molecule :

- (a) NH_3 and NO_2^- . (b) BF_3 and NH_2^- .
(c) BF_3 and NO_2^- . (d) NH_2^- and H_2O .

P.G./INTEGRATED P.G. ENTRANCE EXAMINATION, APRIL 2023**COMPUTER SCIENCE**

Time : Two Hours

Maximum : 400 Marks

Part 1**Computer Science.***Each question carries 4 marks.**1 mark will be deducted for each wrong answer.*

1. Which of the following is the smallest unit of data in computer ?
(A) Nibble. (B) Byte.
(C) Bit. (D) Byte.
2. Computers can be classified to... generations :
(A) 3. (B) 6.
(C) 4. (D) 5.
3. Choose the correct sequence :
(A) KB - TB - GB - MB. (B) KB - MB - GB - TB.
(C) KB - GB - MB - TB. D. MB - KB - TB - GB.
4. Second generation computers are made of _____.
(A) LSI. (B) SLSI.
(C) Vacuum tubes. (D) Transistors.
5. _____ is the fastest memory.
(A) Cache memory. (B) Main memory.
(C) Registers. (D) Secondary memory.
6. Radix of octal number system is :
(A) 4. (B) 7.
(C) 8. (D) 80.

Turn over

7. _____ Is an example for language translator.
- (A) Compiler. (B) Interpreter.
(C) Assembler. (D) All of these.
8. Expand UPS :
- (A) Uninterrupted power supply. (B) Uniform power supply.
(C) Universal power supply. (D) United power supply.
9. Trackball is an output device :
- (A) False.
(B) True.
10. _____ byte is called nibble.
- (A) 2. (B) 1024.
(C) $\frac{1}{2}$. (D) 8.
11. In a synchronous modem, the receive equalizer is known as :
- (A) Adaptive equalizer. (B) Impairment equalizer.
(C) Statistical equalizer. (D) Compromise equalizer.
(E) None of the above.
12. Which of the following best describes the scopes on each DHCP server, in the absence of configuration problems with DHCP addresses, if you use multiple DHCP servers in your environment ?
- (A) Unique to that subnet only. (B) For different subnets.
(C) For no more than two subnets. (D) For no subnets.
(E) None of the above.
13. Which file transfer protocol uses UDP ?
- (A) NFS. (B) TELNET.
(C) TFTP. (D) FTP.
(E) None of the above.

14. You are working with a class C network. You are required to configure it for five subnets, each of which will support 25 nodes. What subnet should you use ?
- (A) 255.255.255.0. (B) 255.255.255.224.
(C) 255.255.255.240. (D) 255.255.255.248.
(E) 255.255.255.252.
15. Which of the following medium access control technique is used for bus/tree ?
- (A) Token ring. (B) Token bus.
(C) CSMA. (D) MAC.
(E) None of the above.
16. A batch processing terminal would not include a :
- (A) CPU. (B) Card reader.
(C) Card punch. (D) Line printer.
(E) None of the above.
17. The physical layer of a network :
- (A) Defines the electrical characteristics of signals passed between the computer and communication devices.
(B) Controls error detection and correction.
(C) Constructs packets of data and sends them across the network.
(D) All of the above.
(E) None of the above..
18. Which of the following allows devices on one network to communicate with devices on another network ?
- (A) Multiplexer. (B) Gateway.
(C) t-switch. (D) Modern.
(E) None of the above.

Turn over

19. The _____ layer is the layer closest to the transmission medium.
- (A) Transport. (B) Network.
(C) Data link. (D) Physical.
(E) None of the above.
20. In a _____ topology, if there are n devices in a network, each device has $n - 1$ ports for cables.
- (A) Ring. (B) Bus.
(C) Star. (D) Mesh.
21. The program that translates your code from a high-level language to the binary language is called _____.
- (A) Compiler. (B) Programmer.
(C) Translator. (D) Linker.
22. Which data type is most appropriate for storing the value 57,000 in a 32-bit system?
- (A) Signed short. (B) Unsigned short.
(C) Long. (D) Int.
23. What is a String in C?
- (A) Char variable. (B) An array of char
(C) An array of int. (D) An array of long.
24. When a double is converted to a float, its value is _____?
- (A) Rounded. (B) Truncated.
(C) Depends on compiler. (D) Depends on the standard.
25. Identify the wrong statement :
- (A) Putchar(65). (B) Putchar('x').
(C) Putchar("x"). (D) Putchar('.

26. The output of the following code is :

```
void main()
{
    int a;
    int &b = a;
    a=100;
    printf("b=%d\ta=%d", b,a)
}
```

(A) b=100 a=100.

(B) b=100 a=0.

(C) b=0 a=100.

(D) Error.

27. Unsigned char has a range from 0 to :

(A) 253.

(B) 254.

(C) 255.

(D) 256.

8. Prototype of a function means _____.

(A) Name of Function.

(B) Output of Function.

(C) Declaration of Function.

(D) Input of a Function.

29. If the function returns no value then it is called _____.

(A) Data type function.

(B) Calling function.

(C) Main function.

(D) Void function.

30. How many times will the following loop execute ?

```
for(j = 1; j <= 10; j = j-1)
```

(a) Forever.

(b) Never.

(c) 0.

(d) 1.

Turn over

31. In a one-to-many relationship of a table, 'many' side is called :
(A) Parent. (B) Child.
(C) Sister. (D) Master.
32. A data dictionary is a repository that manages _____.
(A) Memory. (B) Metadata.
(C) Spell Checker. (D) Data Validator.
33. Which one is preserved in execution of transaction in isolation ?
(A) Durability. (B) Consistency.
(C) Atomicity. (D) Isolation.
34. External database is :
(A) Database created using DBMS package.
(B) Database created in MS-Word.
(C) Database created in EXCEL.
(D) All of the above.
35. The _____ operation allows the combining of two relations by merging pairs of tuples, one from each relation, into a single tuple.
(A) Intersection. (B) Union.
(C) Join. (D) Select.
36. Which of the following data types can be integer, float, double precision, data etc., ?
(A) Numeric. (B) Enumerated.
(C) Primitive. (D) User defined.
37. Data independency in DBMS is known as _____.
(A) Data modeling. (B) Data hiding.
(C) Data consistency. (D) Data capturing.
38. In E-R diagram, relationship is represented by :
(A) Diamond shaped. (B) Dashed shaped.
(C) Ellipse shaped. (D) Rectangle shaped.

39. Collecting personal information and **effectively** posing as another individual is known as the crime of _____.
(A) Spooling. (B) Identity theft.
(C) Hacking. (D) Spoofing.
40. _____ is one of the reasons for **problems of data integrity**.
(A) Data redundancy.
(B) Security constraints.
(C) Data inconsistency.
(D) Data availability constraints.
41. All the users of the system who are not **members** of a project group are referred to as :
(A) Group users. (B) File owner.
(C) Group owner. (D) Other users.
42. Which kind of hardware is used the **most in the** input phase of a computer based information system ?
(A) Hard disk. (B) Monitor.
(C) Printer. (D) Keyboard.
43. Digitizing the coordinate values of a **continuous image** is called :
(A) Compression. (B) Quantization.
(C) Sampling. (D) Segmentation.
44. Linear analysis is called _____ in a compiler.
(A) Lexical analysis. (B) Scanning.
(C) Testing. (D) Both (a) and (b).
45. What is the name given to the weapons which use computerized guidance system ?
(A) Starwars weapons. (B) Dumb weapons.
(C) Smart weapons. (D) Guided weapons.

Turn over

46. Which of the following(s) is/are the characteristic(s) of UNIX ?
- (A) Multi user. (B) Multi tasking.
(C) Kernel Manages data. (D) All of these.
47. Additive, Multiplicative, shift, Bitwise logical and assignment operators is _____ operator.
- (A) Conditional. (B) Relational.
(C) Unary. (D) Binary.
48. If a binary tree satisfies shape and order property, it is known as :
- (A) Rooted tree. (B) Heap.
(C) Sequential search tree. (D) Binary search tree.
49. The blinking on and off of characters on a VDU screen is :
- (A) Flicker. (B) Flag.
(C) Flashing. (D) Flat bed plotter.
50. What is the abbreviation of HTML ?
- (A) Hyper Text Markup Language. (B) Hyper Tag Markup Language.
(C) Hyper Text Main Language. (D) Hyper Tag Main Language.

Part II

(a) Electronics.

51. The greatest negative number which can be stored is 8-bit computer using 2's complement arithmetic is _____.
- (A) - 128. (B) 128.
(C) 256. (D) - 256.
52. Which general purpose register holds eight-bit divisor and store the remainder especially after the execution of division operation ?
- (A) Registers R3 through R5. (B) A-Register.
(C) B-Register. (D) Both A and B Register.

53. How does the processor respond to an occurrence of the interrupt ?
- (A) By Interrupt Status Subroutine.
 - (B) By Interrupt Structure Subroutine.
 - (C) By Interrupt System Subroutine.
 - (D) By Interrupt Service Subroutine.
54. While coupling of LEDs with fibre, on which factor does the size of source and lighting angle generated within the semiconductor depend ?
- (A) Geometry of die.
 - (B) Refractive index of semiconductor.
 - (C) Encapsulation Medium.
 - (D) All of the above.
55. The output signal is fed back at the input side from the ——— point.
- (A) Summing.
 - (B) Take-off
 - (C) Differential.
 - (D) All of the above
56. The load impedance Z_L of a CE amplifier has R and L in series. The phase difference between output and input will be ———.
- (A) 180° .
 - (B) More than 180° but less than 270° .
 - (C) 0.
 - (D) More than 90° but less than 180° .
57. In an LC oscillator, the frequency of oscillator is ——— L or C.
- (A) Proportional to square of.
 - (B) Inversely proportional to square root of.
 - (C) Directly proportional to.
 - (D) Independent of the values of.

Turn over

58. ——— cannot be fabricated on an IC :
- (A) Large inductors and transformers.
 - (B) Diodes.
 - (C) Transistors.
 - (D) Resistors.
59. Which type of networks allow the physical separability of the network elements for analysis purpose ?
- (A) Distributed Networks.
 - (B) Unilateral Networks.
 - (C) Lumped Networks.
 - (D) Bilateral Networks.
60. What is the total resistance of a voltmeter on the 10 V range when the meter movement is rated for 50 μ A of full-scale current ?
- (A) 10 k Ω .
 - (B) 200 k Ω .
 - (C) 20 k Ω .
 - (D) None of the above.

(b) Physics

61. If electrical conductivity increases with the increase of temperature of a substance, then it is a :
- (A) Conductor.
 - (B) Semiconductor.
 - (C) Insulator.
 - (D) Carborator.
62. Which law is also called the law of inertia ?
- (A) Newton's Second law.
 - (B) Newton's First Law.
 - (C) Newton's Third Law.
 - (D) All of these.
63. A cyclist moves along a circular path of radius 70m. If he completes one round in 11s, calculate the total length of a path.
- (A) 440 m.
 - (B) 40 m.
 - (C) 0 m.
 - (D) 11 m.

64. What is the minimum number of **coplanar** vectors of different magnitudes which can give zero resultant ?
- (A) One. (B) Two.
(C) Three. (D) Four.
65. In a SHM, for what value of w , will the **magnitude** of maximum acceleration be greater than the magnitude of maximum velocity? Here, w is angular frequency.
- (A) $w > 1$.
(B) $w < 1$.
(C) $w = 0$.
(D) Not possible for any value of w .
66. The velocity of a car A is to $5\hat{i}$. The **velocity** of another car B is $22\hat{i} - 7\hat{j}$. What is the relative velocity of A with respect to B ?
- (A) $-17\hat{i} + 7\hat{j}$. (B) $7\hat{i} + 17\hat{j}$.
(C) $-7\hat{i} + 17\hat{j}$. (D) $-17\hat{i} + 7\hat{j}$.
67. A person is standing in an elevator. In which **situation** he finds his weightless ?
- (A) When the elevator moves upward **with constant acceleration**.
(B) When the elevator moves downward **with constant acceleration**.
(C) When the elevator moves upward **with uniform velocity**.
(D) When the elevator moves downward, **with uniform velocity**.
68. If the length of a simple pendulum is increased by 2%, then the time period ———.
- (A) Increases by 1 %. (B) Decreases by 1 %.
(C) Increases by 2 %. (D) Decreases by 2 %.
69. Which law states that, under the same conditions of temperature and pressure, equal volumes of all gas contains equal number of molecules.
- (A) Grahams law. (B) Colioli Effect.
(C) Pascal's Law. (D) Avogadro's Law.

Turn over

70. The speed of sound travel fastest through :

- (A) Solid. (B) Liquid.
(C) Gas. (D) None of the above.

(c) Mathematics

71. If A and B are symmetric matrices of the same order, then :

- (A) AB is a symmetric matrix.
(B) A - B is askew-symmetric matrix.
(C) AB + BA is a symmetric matrix.
(D) AB - BA is a symmetric matrix.

72. If A is a square matrix, then A - A' is a :

- (A) Diagonal matrix. (B) Skew-symmetric matrix.
(C) Symmetric matrix. (D) None of these.

73. If A is a square matrix, then A - A' is a :

- (A) Diagonal matrix. (B) Skew-symmetric matrix.
(C) Symmetric matrix. (D) None of these.

74. If A = diag (3, -1), then matrix A is :

(a) $\begin{bmatrix} 0 & 3 \\ 0 & -1 \end{bmatrix}$

(b) $\begin{bmatrix} -1 & 0 \\ 3 & 0 \end{bmatrix}$

(c) $\begin{bmatrix} 3 & 0 \\ 0 & -1 \end{bmatrix}$

(d) $\begin{bmatrix} 3 & -1 \\ 0 & 0 \end{bmatrix}$

75. The p^{th} derivative of a q^{th} degree monic polynomial, where p, q are positive integers and

$$2p^4 + 3pq \cdot \frac{3}{2} = 3q \cdot \frac{3}{2} + 2qp^3 \text{ is given by ?}$$

- (A) Cannot be generally determined.
(b) $(q-1)!$.
(c) $(q)!$.
(d) $(q-1)! * p^q$.

76. At the point of discontinuity, sum of the series is equal to ———.
- (A) $_{12}[f(x+0) - f(x-0)]$. (B) $_{12}[f(x+0) + f(x-0)]$.
- (C) $_{14}[f(x+0) - f(x-0)]$. (D) $_{14}[f(x+0) + f(x-0)]$.
77. Find the directional derivative of $\phi = xy^2 + yz^3$ at $(1, -1, 1)$, towards the point $(2, 1, -1)$.
- (A) 53. (B) -53.
- (C) 73. (D) 13.
78. The unit normal vector $n^{\wedge}$ of the cone of revolution $z^2 = 4(x^2 + y^2)$ at the Point P $(1, 0, 2)$ is ?
- (A) $[\pm 2/\sqrt{5}, 0, \mp 1/\sqrt{5}]$. (B) $[2/\sqrt{5}, 0, 1/\sqrt{5}]$.
- (C) $[-2/\sqrt{5}, 0, -1/\sqrt{5}]$. (D) $[\pm 2/\sqrt{5}, 0, \pm 1/\sqrt{5}]$.
79. Find $\partial z / \partial x$ where $Z = ax_2 + 2by_2 + 2bxy$:
- (A) $3by$. (B) $2ax$.
- (C) $3(ax + by)$. (D) $2(ax + by)$.
80. What is the order of the equation, $xy_3 (\partial y / \partial x)^2 + yx^2 + \partial y / \partial x = 0$?
- (A) Third Order. (B) Second Order.
- (C) First Order. (D) Zero Order.

(d) Statistics

81. The expectation of a random variable X ($E(X)$) can be written as ———.
- (A) $d/dt [MX(t)] (t=0)$. (B) $d/dx [MX(t)] (t=0)$.
- (C) $d_2/dt_2 [MX(t)] (t=0)$. (D) $d_2/dx_2 [MX(t)] (t=0)$.
82. What is the mean and variance for standard normal distribution ?
- (A) Mean is 0 and variance is 1.
- (B) Mean is 1 and variance is 0.
- (C) Mean is 0 and variance is ∞ .
- (D) Mean is ∞ and variance is 0.

Turn over

83. Find λ in Poisson's distribution if the probabilities of getting a head in biased coin toss as $\frac{3}{4}$ and 6 coins are tossed.
- (A) 3.5. (B) 4.5.
(C) 5.5. (D) 6.6.
84. Find the mean of tossing 8 coins.
- (A) 2. (B) 4.
(C) 8. (D) 1.
85. If 40 % of boys opted for maths and 60% of girls opted for maths, then what is the probability that maths is chosen if half of the class's population is girls.
- (A) 0.5. (B) 0.6.
(C) 0.7. (D) 0.4.
86. Suppose 5 men out of 100 men and 10 women out of 250 women are colour blind, then find the total probability of colour blind people. (Assume that both men and women are in equal numbers.
- (A) 0.45. (B) 0.045.
(C) 0.05. (D) 0.5.
87. Three companies A, B and C supply 25 %, 35 % and 40 % of the notebooks to a school. Past experience shows that 5 %, 4 % and 2 % of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?
- (A) $\frac{44}{69}$. (B) $\frac{25}{69}$.
(C) $\frac{13}{24}$. (D) $\frac{11}{24}$.
88. If ${}^{16}P_{r-1} : {}^{15}P_{r-1} = 16 : 7$ then find r .
- (A) 10. (B) 12.
(C) 7. (D) 8.
89. In a colony, there are 55 members. Every member posts a greeting card to all the members. How many greeting cards were posted by them?
- (A) 990. (B) 890.
(C) 2970. (D) 1980.

90. Find the sum of all four digit numbers that can be formed by the digits 1, 3, 5, 7, 9 without repetition.

- (A) 666700. (B) 666600.
(C) 678860. (D) 665500.
(e) Chemistry.

(e) Chemistry

91. Which one of the following exhibits rotational spectra ?

- (A) H_2 (B) Cl_2 .
(C) CO (D) CO_2 .

92. The order of polarity of NH_3 , NF_3 and BF_3 is :

- (A) $NF_3 < NH_3 < BF_3$. (B) $BF_3 < NF_3 < NH_3$.
(C) $BF_3 < NH_3 < NF_3$. (D) $NF_3 < BF_3 < NH_3$.

93. Select the pair with highest electronegativity difference

- (A) Li, F. (B) Na, Cl.
(C) Li, Br. (D) K, F.

94. Hybridisation of ClF_3 molecule is _____.

- (A) sp^3 . (B) sp^3d^2 .
(C) sp^3d . (D) sp^3d^3 .

95. The highest oxidation state is achieved by :

- (A) Cr. (B) V.
(C) Co. (D) Mn.

96. Neon lamps are used in botanical gardens and in green houses as they :

- (A) Provide better light. (B) Provide Oxygen.
(C) Stimulate growth of plants. (D) None of above.

97. Which has maximum ionization energy ?

- (A) Mg. (B) Mg^+ .
(C) Mg^{2+} . (D) All above have same level.

Turn over

98. Bond order of He molecule is :
- (A) 1. (B) 2.
(C) 3. (D) 0.
99. An aqueous solution of sucrose is :
- (A) Dextrorotatory and exhibit mutarotation.
(B) Laevorotatory and not exhibit mutarotation.
(C) Dextrorotatory and not exhibit mutarotation.
(D) Laevorotatory and exhibit mutarotation.
100. The Standard entropy of N_2 , O_2 and NO at 25 C are $210.45 \text{ JK}^{-1} \text{ mol}^{-1}$, $191.62 \text{ JK}^{-1} \text{ mol}^{-1}$ and $205.01 \text{ JK}^{-1} \text{ mol}^{-1}$ respectively. Calculate the standard entropy Change of the reaction.
- (A) 23.39 JK^{-1} . (B) 24.27 JK^{-1} .
(C) 25.17 JK^{-1} . (D) 22.66 JK^{-1} .

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(Pages : 16)

Name.....

Reg. No.....

P.G. ENTRANCE EXAMINATION, APRIL 2024

COMPUTER SCIENCE

Time : Two Hours

Maximum : 400 Marks

*Each question carries 4 marks.
1 mark will be deducted for each wrong answer.*

Part I

1. Which of the following is the first step in SDLC framework ?
 - (a) Feasibility Study.
 - (b) Requirement Gathering.
 - (c) Communication.
 - (d) System Analysis
2. The 4GT Model acts as a package of _____.
 - (a) Software Tools.
 - (b) Software Programs.
 - (c) CASE tools.
 - (d) None of the above.
3. Code is checked in which type of testing ?
 - (a) White box testing.
 - (b) Black box testing.
 - (c) Green box testing.
 - (d) Red box testing.
4. Which of these specifiers would be applied to the constructors only ?
 - (a) Explicit.
 - (b) Implicit.
 - (c) Protected.
 - (d) Public.
5. What is the name of the feature in which we enforce the definitions of the abstract function at the compile time ?
 - (a) Dynamic Polymorphism.
 - (b) Static Polymorphism.
 - (c) Dynamic or Static Polymorphism according to need.
 - (d) Polymorphism.

Turn over

6. Which of these types of values result from a delete operator ?
- (a) Null.
 - (b) Null pointer.
 - (c) Void pointer.
 - (d) Void.
7. A user can make any change in the image using :
- (a) Interactive computer graphics.
 - (b) Non-Interactive computer graphics.
 - (c) Both (a) and (b).
 - (d) None of the above.
8. DDA stands for _____.
- (a) Data differential analyzer.
 - (b) Direct difference analyzer.
 - (c) Digital differential analyzer.
 - (d) Direct Differential Analyzer.
9. According to the Cohen-Sutherland algorithm, where the line lies, if the 4-bit code of both ends is 0000, and also the logical OR gives 0000 ?
- (a) Half outside half inside.
 - (b) Completely inside.
 - (c) Completely outside.
 - (d) None of the above.
10. Which of the following statements regarding Build and Fix Model is wrong ?
- (a) No room for structured design.
 - (b) Code soon becomes unfixable and unchangeable.
 - (c) Maintenance is practically not possible.
 - (d) It scales up well to large projects.
11. Which normalization form is based on the transitive dependency ?
- (a) 1NF.
 - (b) 2NF.
 - (c) 3NF.
 - (d) BCNF.
12. _____ is a powerful language for working with RDBMS.
- (a) Embedded Programs.
 - (b) Dynamic Programs.
 - (c) Query Language.
 - (d) Static Language Programs.

13. Which contains information about a file needed by system programs for accessing file records ?
- (a) File blocks. (b) File operators.
(c) File headers. (d) None of these.
14. _____ is a statement that is executed automatically by the system.
- (a) Trigger. (b) Assertion.
(c) Durability. (d) Integrity constraint.
15. The only way to undo the effects of a committed transaction is to execute a _____.
- (a) Committed transaction. (b) Compensating transaction.
(c) Supplementary transaction. (d) Update query.
16. In _____, one or more users/programs attempt to access the same data at the same time.
- (a) Concurrency. (b) Transaction control.
(c) Locking. (d) Two-phase locking.
17. _____ when a process leaves a critical section and more than one process is waiting, the selection of a waiting process is arbitrary :
- (a) Busy waiting is employed. (b) Starvation is possible.
(c) Deadlock is possible. (d) All of the above.
18. _____ lends itself to implementation in distributed systems as well as in shared-memory multiprocessor and uni-processor systems.
- (a) Monitor. (b) Message passing.
(c) Strong semaphore. (d) Binary semaphore.
19. Which of the following is/are the requirements of memory management ? (i) Relocation ; (ii) Protection ; (iii) Sharing ; (iv) Memory organization.
- (a) (i), (ii) and (iii) only. (b) (ii), (iii) and (iv) only.
(c) (i), (iii) and (iv) only. (d) All (i), (ii), (iii) and (iv).

Turn over

20. The satisfaction of the relocation requirement increases the difficulty of satisfying the requirement.
- (a) Protection.
 - (b) Sharing.
 - (c) Logical Organization.
 - (d) Physical Organization.
21. What is the use of Bridge in Network ?
- (a) To connect LANs.
 - (b) To separate LANs.
 - (c) To control Network Speed.
 - (d) All of the above.
22. Which of the following layer of OSI model also called end-to-end layer ?
- (a) Presentation layer.
 - (b) Network layer.
 - (c) Session layer.
 - (d) Transport layer.
23. The processes on each machine that communicate at a given layer are called :
- (a) UDP process.
 - (b) Intranet process.
 - (c) Server technology.
 - (d) Peer-peer process.
24. What is the main function of the command interpreter?
- (a) To provide the interface between the API and application program.
 - (b) To handle the files in the operating system.
 - (c) To get and execute the next user-specified command.
 - (d) None of the mentioned.
25. For real time operating systems, interrupt latency should be _____.
- (a) One.
 - (b) Minimal.
 - (c) Maximum.
 - (d) Dependent on the scheduling.

26. Whenever a process needs I/O to or from a disk it issues a _____.
(a) System call to the operating system.
(b) A special procedure.
(c) System call to the CPU.
(d) All of the mentioned.
27. The _____ program initializes all aspects of the system, from CPU registers to device controllers and the contents of main memory, and then starts the operating system.
(a) Bootstrap. (b) Main.
(c) Bootloader. (d) Rom.
28. Which of the following is a popular front-end framework for building user interfaces in JavaScript ?
(a) Django. (b) Angular.
(c) Flask. (d) Node.js
29. What is the special feature of modern web applications ?
(a) Must load the document to manipulate.
(b) Can alter contents without loading document.
(c) Can't be altered at all.
(d) Remains static.
30. What are the disadvantages of arrays ?
(a) Index value of an array can be negative
(b) Elements are sequentially accessed
(c) Data structure like queue or stack cannot be implemented
(d) There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size

Turn over

31. Which of the following application makes use of a circular linked list ?
- (a) Recursive function calls.
 - (b) Undo operation in a text editor.
 - (c) Implement Hash Tables.
 - (d) Allocating CPU to resources.
32. The IA-32 system follows which of the following design ?
- (a) CISC.
 - (b) RISC.
 - (c) SIMD.
 - (d) None of the mentioned.
33. For a given FINITE number of instructions to be executed, which architecture of the processor provides for a faster execution ?
- (a) ANSA.
 - (b) Super-scalar.
 - (c) ISA.
 - (d) All of the mentioned.
34. The bit used to signify that the cache location is updated is _____.
- (a) Flag bit.
 - (b) Reference bit.
 - (c) Update bit.
 - (d) Dirty bit.
35. What's the key benefit of using deep learning for tasks like recognizing images ?
- (a) They need less training data than other methods.
 - (b) They're easier to explain and understand than other models.
 - (c) They can learn complex details from the data on their own.
 - (d) They work faster and are more efficient computationally.
36. What elements describe the Candidate-Elimination algorithm ?
- (a) Depends on the dataset.
 - (b) Just a set of candidate hypotheses.
 - (c) Just a set of instances.
 - (d) Set of instances, set of candidate hypotheses.

37. Which of the following statements is not true about boosting ?
- (a) It mainly increases the bias and the variance.
 - (b) It tries to generate complementary base-learners by training the next learner on the mistakes of the previous learners.
 - (c) It is a technique for solving two-class classification problems.
 - (d) It uses the mechanism of increasing the weights of misclassified data in preceding classifiers
38. Assembler is used as a translator for ?
- (a) Low level language.
 - (b) High Level Language
 - (c) COBOL.
 - (d) C.
39. Which of the following is not a process state ?
- (a) Terminated.
 - (b) Running.
 - (c) Blocked.
 - (d) Execution.
40. A person who designs the programs in a software package is called :
- (a) User.
 - (b) Software Manager.
 - (c) System Developer.
 - (d) System Programmer.
41. A pointer variable can be :
- (a) Passed to a function.
 - (b) Changed within a function.
 - (c) Returned by a function.
 - (d) Can be assigned an integer value.
42. Which of the following data type is supported in C++ but not in C ?
- (a) Bool.
 - (b) Char.
 - (c) Double.
 - (d) Float.
43. By which of the following can the if-else statement be replaced ?
- (a) Logical operator.
 - (b) Bitwise operator.
 - (c) Conditional operator.
 - (d) Arithmetic operator.

Turn over

44. Why is haptic feedback important ?
- (a) It helps with a sense of presence for a better immersive experience.
 - (b) It helps eyes to focus when there is a lot of contrasting light.
 - (c) It monitors the field of view and adjusts accuracy of digital images.
 - (d) It creates a mesh for a better view of the surrounding space.
45. What is the term for the ability to physically move around in a virtual space ?
- (a) Teleportation.
 - (b) Locomotion.
 - (c) Haptic feedback.
 - (d) Gesture recognition.
46. Which of these cannot be used for a variable name in Java ?
- (a) Identifier and keyword.
 - (b) Identifier.
 - (c) Keyword.
 - (d) None of the mentioned.
47. What is Truncation in Java ?
- (a) Floating-point value assigned to a Floating type.
 - (b) Floating-point value assigned to an integer type.
 - (c) Integer value assigned to floating type.
 - (d) Integer value assigned to integer type.
48. Which of the following statement is true ?
- (a) DELETE does not free the space containing the table and TRUNCATE free the space containing the table.
 - (b) Both DELETE and TRUNCATE free the space containing the table.
 - (c) Both DELETE and TRUNCATE does not free the space containing the table.
 - (d) DELETE free the space containing the table and TRUNCATE does not free the space containing the table.

49. What is the purpose of the SQL AS clause ?
- (a) The AS SQL clause is used to change the name of a column in the result set or to assign a name to a derived column.
 - (b) The AS clause is used with the JOIN clause only.
 - (c) The AS clause defines a search condition.
 - (d) All of the mentioned.
50. Which of the following is not an operator in C ?
- (a) ,
 - (b) sizeof()
 - (c) ~
 - (d) None of the mentioned.

Part II

(a) Electronics

51. An ideal Op-amp is an ideal :
- (a) Voltage controlled current source.
 - (b) Voltage controlled voltage source.
 - (c) Current controlled current source.
 - (d) Current controlled voltage source.
52. Free electrons exist in :
- (a) First band.
 - (b) Second band.
 - (c) Third band.
 - (d) Conduction band.
53. Which of the following is correct about semiconductors in electronic devices ?
- (a) Elemental semiconductors have direct band gap.
 - (b) Compound semiconductors have indirect band gap.
 - (c) Extrinsic semiconductors are injected with impurities.
 - (d) Doping is done in Intrinsic semiconductors.

Turn over

54. Which of the following semiconductor is mostly used to construct electronic circuits ?
- (a) Silicon.
 - (b) Germanium.
 - (c) Selenium.
 - (d) Tin.
55. Which of the following effects is responsible for violating the mass action law in degenerative type semiconductor electronic devices ?
- (a) Thermal effect.
 - (b) Bandgap narrowing effect.
 - (c) Lattice vibration effect.
 - (d) Electronic drift effect.
56. Which of the following is true about Zener diode ?
- (a) It is lightly doped
 - (b) It is mostly used in voltage regulator electronic circuits
 - (c) It is used in forward bias
 - (d) It has avalanche breakdown
57. Electromagnetic waves are produced by :
- (a) A static charge.
 - (b) An accelerated charge.
 - (c) A moving charge.
 - (d) Charged particles.
58. The ratio of the amplitude of the magnetic field to the amplitude of the electric field for electromagnetic wave propagation in a vacuum is equal to :
- (a) Unity.
 - (b) Speed of light in vacuum.
 - (c) Reciprocal of the speed of light in vacuum.
 - (d) The ratio of magnetic permeability to electrical susceptibility in a vacuum.
59. What kind of bonding cement is supposed to get cured instantaneously in the fabrication process of strain-gauge used as a pressure measuring transducer ?
- (a) Duco Cement.
 - (b) Epoxy Cement.
 - (c) Acrylic Cement.
 - (d) Phenolic Bakelite Cement.

60. How does the appearance of any noise rather than the electrical noise that intrude in the current output signal of two-wire transmitter get eliminated ?
- (a) By common-mode rejection of transmitting device.
 - (b) By common-mode rejection of interfacing device.
 - (c) By common-mode rejection of receiving device.
 - (d) None of the above.

(b) Physics

61. In the equilibrium state :
- (a) Probability is maximum.
 - (b) P parameters of two systems are equal.
 - (c) Both (a) and (b).
 - (d) Number of particles is maximum.
62. Out of n particles in a gas, the number of particles having exactly the most probable velocity
- (a) Zero.
 - (b) n .
 - (c) $n/2$.
 - (d) 10.
63. 59. A spaceship of mass 10^6 kg is to be accelerated to $0.80c$. How much energy does this require ?
- (a) $2.5 \times 10^{23} \text{ J}$.
 - (b) $1.5 \times 10^{23} \text{ J}$.
 - (c) $7.2 \times 10^{23} \text{ J}$.
 - (d) $6.0 \times 10^{23} \text{ J}$.
64. A satellite is powered by a small nuclear generator that puts out 15 W. How much matter is converted into energy over the 10 year life span of the generator ?
- (a) 53 μg .
 - (b) 56 g.
 - (c) 17 g.
 - (d) 16 kg.
65. What is the main point of the de-Broglie equation ?
- (a) The position of the light cannot be precisely determined.
 - (b) Matter only behaves like a particle.
 - (c) Matter has wave like properties.
 - (d) Einstein's theory of relativity was incorrect.

Turn over

66. The probability density of a particle is :
- (a) Always positive.
 - (b) Negative.
 - (c) Can be negative or positive.
 - (d) complex quantity.
67. How is information extracted from a wave function ?
- (a) Operators.
 - (b) Expectation value.
 - (c) Differential.
 - (d) Partial differential.
68. For which of the following is the field of view maximum ?
- (a) Concave mirror.
 - (b) Convex mirror.
 - (c) Plane mirror.
 - (d) Cylindrical mirror.
69. Which of the following statements is true for total internal reflection ?
- (a) Light travels from rarer medium to denser medium.
 - (b) Light travels from denser medium to rarer medium.
 - (c) Light travels in water only.
 - (d) Light travels in the air only.
70. For a telescope, the larger the diameter of the objective lens :
- (a) Greater the resolving power.
 - (b) Greater the magnifying power.
 - (c) Smaller the resolving power.
 - (d) Smaller the magnifying power.

(c) Mathematics

71. For a determinant containing 4 elements $a_1 b_1 a_2 b_2$, what will the elements of the leading diagonal ?
- (a) $a_1 b_1$.
 - (b) $a_1 b_2$.
 - (c) $a_2 b_1$.
 - (d) $a_2 b_2$.

72. Find the positive root of the equation $x^3 + 2x^2 + 10x - 20$ using Regula Falsi method and correct upto 4 decimal places.
- (a) 1.3688. (b) 1.3866.
(c) 1.4688. (d) 1.6488.
73. The converse of Cauchy- integral theorem is :
- (a) Euler's theorem. (b) Liouville's theorem.
(c) Morera's theorem. (d) Goursat's theorem.
74. Piecewise smooth curve is also known as :
- (a) Contour. (b) Smooth curve.
(c) Circle. (d) Regular curve.
75. The volume of a right circular cylinder depends on its ———.
- (a) Width. (b) Radius of curvature.
(c) Height. (d) Radius and height.
76. The volume of a rectangular box depends on its length, width and ———.
- (a) Height. (b) Area.
(c) Curvature. (d) Width.
77. Opposite vertical angles are also ———.
- (a) Scalene. (b) Equal
(c) Not equal. (d) Opposite.
(e) None of These.
78. Two angles are complementary, one of angle is of 52° . What will be the angle, of the second ?
- (a) 78° . (b) 90° .
(c) 38° . (d) 138° .
79. There is a metric space (E, d) such that every Cauchy sequence in (E, d) is convergent, then the metric space is :
- (a) Semi-complete. (b) Incomplete.
(c) Complete. (d) None of these.

Turn over

80. The metric space R^2 is a topological space is the union of open intervals is called real Eudidean —

- (a) Space.
- (b) Line.
- (c) Plane.
- (d) None of these.

(d) Statistics

81. The best fit line method for data in Linear Regression ?

- (a) Least Square Error.
- (b) Maximum Likelihood.
- (c) Logarithmic Loss.
- (d) Both (a) and (b).

82. Linear regression uses ————— for graphical representation in determining the strength of the relationship between two variables.

- (a) Barchart.
- (b) Pie chart.
- (c) Scatter diagram.
- (d) Anova.

83. The control charts and procedures of descriptive statistics which are used to enhance a procedure can be. classified into which of these categories ?

- (a) Behavioural tools.
- (b) Serial tools.
- (c) Industry statistics.
- (d) Statistical tools.

84. Company A produces 10 % defective products, Company B produces 20 % defective products and C produces 5 % defective products. If choosing a company is an equally likely event, then find the probability that the product chosen is defective.

- (a) 0.14.
- (b) 0.23.
- (c) 0.22.
- (d) 0.12.

85. The annual salaries of workers in a manufacturing factory are normally distributed with a mean of Rs. 48,000 and a standard deviation of Rs. 1,500. Find the probability of workers who earn between Rs. 35,000 and Rs. 52,000.

- (a) 22 %.
- (b) 42.1 %.
- (c) 63 %.
- (d) 76.2 %.

86. To find the optimal solution, we apply _____.
(a) LPP. (b) VAM.
(c) MODI Method. (d) Rim.
87. For maximization in TP, the objective is to maximize the total _____.
(a) Solution. (b) Profit Matrix.
(c) Profit. (d) None of the above.
88. Power spectral density function is a ?
(a) Real and even function. (b) Periodic.
(c) Non-negative function. (d) All of the mentioned.
89. Which of the following is not an assumption of parametric inference methods :
(a) Data is quantitative.
(b) Population has a known distribution.
(c) Sample is sufficiently large.
(d) Data is qualitative.
90. Parameters are constants in :
(a) Sample. (b) Probability distribution.
(c) Estimators 1 2. (d) None of the above
- (e) Chemistry
91. The _____ is used as the agricultural fertilizer.
(a) Bio ethanol. (b) Bio ethane.
(c) Bio methanol. (d) Digestrate.
92. One of the disadvantages of solid fuel is _____.
(a) Clinker formation. (b) Moderate ignition temperature.
(c) Storage. (d) Transportation.
93. The formation of coal is explained by _____.
(a) Nuclear theory. (b) In-situ theory.
(c) Molecular theory. (d) Ex-situ theory.

Turn over

94. Which of the mentioned is the formula of Oleum ?
(a) $\text{H}_2\text{S}_2\text{O}_8$. (b) $\text{H}_2\text{S}_2\text{O}_6$.
(c) $\text{H}_2\text{S}_2\text{O}_7$. (d) $\text{H}_2\text{S}_2\text{O}_5$.
95. Cryogenics deal with which of the following mentioned ?
(a) Production and utilization of low temperatures from 0 K to 123K.
(b) Production and utilization of low temperatures from 0 K to 273.15 K.
(c) Production and utilization of high temperatures from 273.15K to 1000K.
(d) Production and utilization of high temperatures from 273.15K to 500K.
96. Which of the following have lowest percentage of uranium present in them ?
(a) Pitchblende.
(b) Monazite sands.
(c) Camotite.
(d) Phosphate rock inclusions.
97. Which of the mentioned names is apt for Acetic Acid ?
(a) Methanoic Acid. (b) Ethanoic Acid
(c) Butanoic Acid. (d) Pentanoic Acid
98. Viscosity of liquid _____ with rise in temperature.
(a) Increases. (b) Is independent.
(c) Remains constant. (d) Decreases.
99. The vapor pressure is directly proportional to the temperature because of :
(a) More kinetic energy only.
(b) Faster particle movement only.
(c) More potential energy.
(d) More kinetic energy and faster particle movement.
100. What is S. I. unit of Surface Tension ?
(a) Dyne/meter. (b) Dyne-meter.
(c) Newton/meter. (d) Newton-meter.