

Tribhuvan University
Institute of Science and Technology
Central Department of Computer Science and Information Technology
MIT Entrance Model Question

Full Marks: 100

Time: 2 Hrs.

Pass Marks: 35

Attempt all questions. Please Tick/Encircle the correct answer. Any omission or correction to the answers is not allowed.

Basic Mathematics

1. The system: $x - y = 7$; $-x + y = 3$ has
 - a. one solution
 - b. no solution**
 - c. infinitely many solutions
 - d. two solutions

2. The vectors $\mathbf{a} = (2, 3)$ and $\mathbf{b} = (4, 6)$ are
 - a. Linearly dependent**
 - b. Orthogonal
 - c. Parallel
 - d. linearly independent

3. The matrix $A = \begin{bmatrix} 1 & 2 \\ 5 & 0 \end{bmatrix}$ is
 - a. triangular
 - b. diagonal
 - c. nonsingular**
 - d. symmetric

4. If $A = \begin{pmatrix} 1 & 2 \\ 3 & 5 \end{pmatrix}$ then A^{-1} is
 - a. $\begin{pmatrix} -1 & -2 \\ -3 & -5 \end{pmatrix}$
 - b. $\begin{pmatrix} 5 & -2 \\ -3 & 1 \end{pmatrix}$
 - c. $1/\begin{pmatrix} 1 & 2 \\ 3 & 5 \end{pmatrix}$
 - d. $\begin{pmatrix} 5 & -2 \\ -3 & 1 \end{pmatrix}$**



5. For all vectors \mathbf{a} and \mathbf{b} in a vector space V we have
- $|\mathbf{a} + \mathbf{b}| \leq |\mathbf{a}| + |\mathbf{b}|$
 - $|\mathbf{a} + \mathbf{b}| < |\mathbf{a}| + |\mathbf{b}|$
 - $|\mathbf{a} + \mathbf{b}| > |\mathbf{a}| + |\mathbf{b}|$
 - $|\mathbf{a} + \mathbf{b}| \geq |\mathbf{a}| + |\mathbf{b}|$
6. The set of positive integers with respect to addition operation is not a group as it has
- identity element
 - no inverse element**
 - no associative property
 - no commutative property
7. The range of $y = \sqrt{x-3}$ is
- $(-\infty, 3]$
 - $(0, 3)$
 - $[0, \infty)$**
 - $[-\infty, \infty]$
8. If $\lim_{x \rightarrow 2} \frac{x^k - 2^k}{x-2} = 32$, then $k = \dots\dots\dots$
- 0/0
 - 2
 - 0
 - 4**
9. The absolute maximum of $f(x) = x^3 + 3x^2$ on $[-3, 1]$ is
- 4**
 - 0
 - 2
 - 12
10. The integral $\int_a^b f(x) dx = \dots\dots\dots$
- $F(a) - F(b)$
 - $F(a) + F(b)$
 - $F(b) - F(a)$**
 - $F(x) + c$
11. The integral $\int_0^3 \frac{dx}{x-3}$
- converges
 - diverges**
 - is not an improper integral
 - none of the above



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12. The solution of $y' + y = 0$, $y(0) = 1$ is
- $e^{-x} + c$
 - e^x
 - $\ln x$
 - e^{-x}
13. The function $f(x) = x^3 - 12x - 5$, in $(-2, 2)$ is
- increasing
 - decreasing
 - neither increasing nor decreasing
 - none of the above
14. If $z = e^{xy}$ then $z_x = \dots\dots\dots$
- xy
 - zy
 - xz
 - e^{xy}
15. The equation of the plane through the point $P(-3, 0, 7)$ perpendicular to $\mathbf{n} = (5, 2, -1)$ is.....
- $5x - 2y - z - 22 = 0$
 - $5x - 2y + z + 22 = 0$
 - $x - 2y - z + 22 = 0$
 - $5x - 2y - z + 22 = 0$

Basic Statistics

16. If you are asked to choose the favorite color from the set of seven colors, what level of measurement would be used from the following?
- Nominal**
 - Ordinal
 - Interval
 - Ratio
17. The arithmetic mean of 6 observations is 2. If a constant value is subtracted from/added to each observation, then the arithmetic mean will
- not be changed
 - be multiple of that constant value
 - be decreased/increase by that constant value**
 - be reciprocal of that constant



18. If there are 20 observations each equal to 20, then the variance of this distribution is
- 400
 - 20
 - 1
 - 0
19. A student is to be selected for scholarship from two campus –Campus A , and campus B. The probability of selecting any one campus is 50%. The probability of selecting a student from Campus A is 80% and that from Campus B is 20%. What is the probability of selecting student from any campus?
- 0.40
 - 0.5**
 - 0.1
 - None of the above
20. Which of the following is true if the correlation coefficient between two variables X and Y is -0.9?
- There is strong correlation because of X
 - Correlation coefficient does not measure the cause and effect relationship between the variables**
 - There is strong correlation because of Y
 - None of the above statement is correct

Software Engineering

21. CMM stands for
- Capability Maturity Model**
 - Configuration Maturity Model
 - Capability Maturity Machine
 - Common Maturity Model
22. Use case diagram helps in gathering
- Non functional requirement
 - Functional requirement**
 - Virtual requirement
 - All of the above
23. The process of generating design specification from code is
- Reengineering
 - Reverse engineering**
 - Design engineering
 - Process engineering

24. Which of the following team structure assigns leader on a adhoc basis?
- a. Controlled Centralized
 - b. **Democratic Decentralized**
 - c. Controlled Decentralized
 - d. Democratic Centralized
25. "Are we building the product right?" resembles to
- a. Validation
 - b. Alpha-testing
 - c. Regression-testing
 - d. **Verification**

Digital Logic

26. Which of the following is the universal gate?
- a. AND
 - b. OR
 - c. **NAND**
 - d. NOT
27. Ripple counter is
- a. Synchronous
 - b. **Asynchronous**
 - c. Serial
 - d. Cyclic
28. Which of the following is true regarding Multiplexer?
- a. One to one
 - b. One to many
 - c. **Many to one**
 - d. Many to many
29. Flip flop can be considered as Element.
- a. **Memory**
 - b. Cache
 - c. Flip
 - d. Race
30. What is the base of BCD?
- a. 2
 - b. 8
 - c. **10**
 - d. 16

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Computer Networks

31. Which are valid ARQ?
- Stop and wait
 - Go back
 - Selective
 - All of the above**
32. Router lies in the Layer
- Physical
 - Data
 - Network**
 - Session
33. TCP header ranges from Bytes.
- 10-20
 - 20-40
 - 40-60**
 - 60-80
34. Which one of the following is true regarding IPv6?
- Classful
 - Classless**
 - Class A
 - Class C
35. Which of the following is true regarding coaxial Cable?
- Supports high bandwidth
 - Are reliable
 - Less affected by noise or cross talk
 - All of the above**

Microprocessor and Architecture

36. 8085 microprocessor consists of Pins.
- 20
 - 30
 - 40**
 - 55
37. Which of the following is true regarding address bus?
- Unidirectional**
 - Bidirectional
 - Any directional
 - All of the above



38. Which sequence is valid?
- a. Execute, fetch, decode
 - b. Fetch, execute, decode
 - c. Decode, fetch, execute
 - d. **Fetch, decode, execute**
39. Pipelining is a technique where instructions are
- a. Overturned
 - b. **Overlapped**
 - c. Overwhelmed
 - d. Overtuned
40. Which of the following is true regarding Booth's Algorithm?
- a. Binary division
 - b. Binary addition
 - c. **Binary multiplication**
 - d. Binary Subtraction

System Analysis and Design

41. Which one of the following information system development models focuses more on risk handling?
- a. Waterfall
 - b. Prototyping
 - c. **Spiral**
 - d. RAD
42. Which one of the following is process modeling tool in structured development?
- a. Class diagram
 - b. **Data flow diagram**
 - c. Entity relationship diagram
 - d. Use case diagram
43. Which one of the following is logic modeling tool in structured development?
- a. Decision table
 - b. Decision tree
 - c. Entity relationship diagram
 - d. **Both a and b**
44. Which one of the following is Agile development methodology?
- a. Scrum
 - b. Extreme Programming
 - c. Kanban
 - d. **All of the above**



45. User testing of a completed information system using simulated data is called
- a. **Alpha testing**
 - b. Beta testing
 - c. Gama testing
 - d. Stress testing

Database Management System

46. Which of the following SQL command is used to remove attributes from an existing relation?
- a. Create table
 - b. Drop table
 - c. **Alter table**
 - d. Create domain
47. Which one of the following normal forms removes transitive dependency?
- a. 1NF
 - b. 2NF
 - c. **3NF**
 - d. 4NF
48. Which one of the following concepts in database management system allows relationships between relationships?
- a. Specialization
 - b. Generalization
 - c. **Aggregation**
 - d. Both a and b
49. Which one of the following is the execution order of commands in SQL query?
- a. SELECT, FROM, WHERE
 - a. SELECT, WHERE, FROM
 - b. FROM, SELECT, WHERE
 - c. **FROM, WHERE, SELECT**
50. Which of the following recovery technique requires undo operation?
- a. Deferred update
 - b. Shadow paging
 - c. **Immediate update**
 - d. Checkpoint



Introduction to Information Technology

51. Components that provide internal storage to the CPU are
- Registers**
 - Program Counters
 - Controllers
 - Internal chips
52. Which of the following is designed to control the operations of a computer?
- System Software**
 - Application Software
 - Utility Software
 - User
53. Which one of the following devices provides communication between a computer and the outer world?
- Compact
 - I/O**
 - Drivers
 - Storage
54. A service that allows a user to log in into another computer somewhere on the Internet.
- Telnet**
 - FTP
 - e-mail
 - UseNet
55. Which one of the following is database management system?
- Word
 - Excel
 - Power point
 - Access**

Data Structure and Algorithm

56. Which of the following is a linear data structure?
- Array**
 - Binary Tree
 - Binary Search Tree
 - AVL tree



57. If the size of the stack is 10 and we try to add the 11th element in the stack then the condition is known as
- a. Underflow
 - b. Garbage Collection
 - c. **Overflow**
 - d. None of the above
58. Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?
- a. Insertion Sort
 - b. Quick Sort
 - c. **Merge Sort**
 - d. Selection Sort
59. How many swaps are required to sort the given array using bubble sort - { 2, 5, 1, 3, 4}
- a. **4**
 - b. 5
 - c. 6
 - d. 7
60. Which data structure is required to convert the infix to prefix notation?
- a. **Stack**
 - b. Linked List
 - c. Binary Tree
 - d. Queue

Computer Graphics

61. From the given list of options, which one is the accurate and efficient line-generating algorithm?
- a. Midpoint algorithm
 - b. DDA algorithm
 - c. **Bresenham's line algorithm**
 - d. None of the above
62. Which of the following is a Computer Graphics Curve?
- a. Bezier Curves
 - b. Implicit Curves
 - c. Explicit Curves
 - d. **All of the above**
63. The three primary colors define which of these color models?
- a. CMY and HSV
 - b. RGB and HSV
 - c. **RGB and CMY**
 - d. HSV and HLS



64. Geometric transformation include

- a. Transition
- b. Drawing
- c. **Scaling**
- d. None of the above

65. The process of positioning an object along a straight line path from one coordinate point to another is called

- a. **Translation**
- b. Reflection
- c. Shearing
- d. Transformation

E-Commerce

66. is an early form of E-commerce

- a. SCM
- b. **EDI**
- c. Both of these
- d. None of these

67. Which dimension of e-commerce enables commerce beyond the boundaries of the country?

- a. Richness
- b. Interactivity
- c. **Global Reach**
- d. Ubiquity

68. Which is the set of rules that limits access to information?

- a. Availability
- b. Integrity
- c. Authenticity
- d. **Confidentiality**

69. Which type of E - Commerce is Amazon?

- a. B2B
- b. **B2C**
- c. G2B
- d. G2C

70. Which is the function of specifying access rights to resources related to information security?

- a. OTP
- b. Pin
- c. **Authorization**
- d. Passcode



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C Programming

71. Let $a=4$, what will be the value of variable a after executing the statement $a=a<<1$.
- 1
 - 2
 - 4
 - 8**
72. Consider $a=4$ and $b=5$; what will be the values of c , a , and b after executing the statement: $c=++a + b++$;
- $a=5$ $b=6$ and $c=11$
 - $a=5$ $b=5$ and $c=10$
 - $a=5$ $b=6$ and $c=10$**
 - $a=4$ $b=6$ and $c=10$
73. Let that $c='a'$, what will be the output of following statements $c=c+1$; $\text{printf}("c=\%c",c)$;
- $c=a$
 - $c=b$**
 - $c=c$
 - Error
74. What will be the best size of character array for storing string of 10 characters?
- 11**
 - 10
 - 9
 - All of the above
75. Which operator is used to access content of a pointer variable?
- Amperсанд Operator
 - Indirection Operator**
 - Star Operator
 - Arrow Operator

Object Oriented Programming

76. Which of the following statement is FALSE about 'endl'?
- It takes cursor of next line
 - It is a manipulator
 - It is an IO stream**
 - It is used with cout.
77. Which of the following statement is TRUE about member variables?
- Memory for member variables is allocated at the time of class declaration
 - Memory for member variables is allocated at the time of object creation**
 - Memory for member variables is allocated at run time
 - None of the above



78. Which concept of C++ breaches data hiding principle of OOP?
- Protected Access Specifier
 - Friend Function**
 - Virtual Function
 - Abstract Class
79. We can define objects of one class within another class as member variables. What we call this feature of OOP?
- Encapsulation
 - Inheritance
 - Membership
 - Aggregation**
80. How can we resolve ambiguity due to multipath inheritance in C++?
- By using virtual base class**
 - By using virtual function
 - By using friend function
 - By using scope resolution operator

Operating Systems

81. Which of the following is example of shell?
- Command Prompt**
 - Disk cleaner
 - Disk defragmenter
 - All of the above
82. Which of the following is non busy waiting technique of interprocess communication?
- Lock variable
 - Peterson's solution
 - Strict Alteration
 - Sleep and wakeup**
83. Which of the following is not a deadlock recovery technique?
- Ostrich Algorithm**
 - Preemption
 - Rollback
 - Killing Processes
84. What will be the size of page number if virtual memory is of size 128 KB and page size is 4 KB
- 2 bit
 - 4 bit
 - 5 bit**
 - 7 bit


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85. What will be the size of bitmap for memory of size 256 KB with block size of 2 KB, if 50% memory is already occupied?
- a. 256 bit
 - b. 128 bit**
 - c. 64 bit
 - d. 32 bit

Web Technology

86. is not a heading tag in HTML.
- a. H0**
 - b. H1
 - c. H2
 - d. H3
87. Which of following is syntax for valid CSS selector?
- a. .id1**
 - b. #id1
 - c. %id1
 - d. \$id1
88. to print statement in PHP
- a. Echo**
 - b. Print
 - c. Echof
 - d. printf
89. Which of the following is used for defining schema of XML?
- a. DTD
 - b. XSD
 - c. Both a and b**
 - d. None of above
90. Which of following is valid variable definition in PHP?
- a. \$x y =2;
 - b. \$x_y=2;**
 - c. \$x_y=2
 - d. \$x y as 2;



Artificial Intelligence

91. Greedy Best First search expands nodes in the state space based on the evaluation function
- $F(n)=g(n)$
 - $F(n)=h(n)$**
 - $F(n)=h(n)+g(n)$
 - $F(n)=g(n)/2$
92. Which agent works based set of condition action rules?
- Simple reflex agent**
 - History agent
 - Model based agent
 - Prior goal based agent
93. Which of following is valid CNF?
- $P \rightarrow Q$
 - $(P \vee Q) \wedge (R \vee S)$**
 - $(P \wedge Q) \vee (R \wedge S)$
 - $P \leftrightarrow Q$
94. In alpha beta pruning, alpha is the best choice found for
- Min
 - Max**
 - min max Both
 - None of above
95. Training artificial neural networks includes
- updating weights**
 - updating inputs
 - updating outputs
 - updating number of input layers

Management Information System

96. Which of following is used for non-routine decision making for middle level management?
- Decision Support System**
 - Transaction Processing System
 - Management Information System
 - Executive Support System


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97. is a collection of independent firms that use information technology to coordinate their value chains to produce a product or service for a market collectively.
- a. Value chain
 - b. Value web**
 - c. Firm chain
 - d. Collective chain
98. Under the ethical principles of rules to make a decision, which of following describes “If an action cannot be taken repeatedly, it should not be taken at any time”.
- a. Golden Rule
 - b. Utilitarian Principle
 - c. Risk Aversion Principle
 - d. Descartes' rule of change**
99. Which of following defines the supply chain management systems based on build-to-order model?
- a. Push-based model
 - b. Pull-based model**
 - c. Build-to-Stock Model
 - d. None of above
100. Key performance indicators (KPIs), which are the measures proposed by for understanding how well the business firm is performing along any given dimension.
- a. clerical workers
 - b. junior management
 - c. senior management**
 - d. executives

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