

1. Which of the following is a square matrix?

- a) 2×3 matrix
- b) 3×3 matrix
- c) 4×2 matrix
- d) 1×4 matrix

2. What is the determinant of a 2×2 matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$?

- a) $ad - bc$
- b) $ac - bd$
- c) $ab - cd$
- d) $bc - ad$

3. The equation of a straight line passing through the points (2, 3) and (4, 7) can be written as:

- a) $y = 2x + 1$
- b) $y = 2x + 3$
- c) $y = 4x - 1$
- d) $y = 4x + 1$

4. What is the value of $\sin(\pi/6)$?

- a) $1/2$
- b) $\sqrt{3}/2$
- c) 1
- d) 0

Answer: a) $1/2$

5. The derivative of $f(x) = 3x^2 - 2x + 1$ is:

- a) $6x - 2$
- b) $6x + 2$
- c) $6x - 1$
- d) $6x + 1$

6. The integral of $\int (3x^2 + 2x) dx$ is:

- a) $x^3 + x^2 + C$
- b) $x^3 + x + C$
- c) $x^2 + x + C$
- d) $3x^2 + 2x + C$

7. The area under the curve $y = 2x$ from $x = 1$ to $x = 3$ is:

- a) 2
- b) 4
- c) 6
- d) 8

8. The determinant of a 3×3 matrix can be found using:

- a) Cramer's Rule
- b) Gaussian Elimination
- c) Inverse Matrix Method
- d) Laplace Expansion

9. The slope of a line parallel to the line $y = 2x + 3$ is:

- a) 2
- b) -2
- c) 3
- d) -3

10. What is the value of $\cos(\pi/3)$?

- a) $1/2$
- b) $\sqrt{3}/2$
- c) 1
- d) 0

11. The derivative of $f(x) = 5x^3 + 2x^2 - 3x + 1$ is:

- a) $15x^2 + 4x - 3$
- b) $15x^2 + 4x + 3$
- c) $15x^2 + 2x - 3$
- d) $15x^2 + 2x + 3$

12. The integral of $\int(4x^3 - 2x^2 + 5x) dx$ is:

- a) $x^4 - (2/3)x^3 + (5/2)x^2 + C$
- b) $x^4 - (2/3)x^3 + 5x^2 + C$
- c) $4x^4 - (2/3)x^3 + 5x^2 + C$
- d) $4x^4 - (2/3)x^3 + (5/2)x^2 + C$

13. The area under the curve $y = 3x^2$ from $x = 0$ to $x = 2$ is:

- a) 4
- b) 8
- c) 12
- d) 16

14. The rank of a 2×2 matrix is:

- a) 0
- b) 1
- c) 2
- d) 3

15. The equation of a line perpendicular to $y = 3x + 2$ can be written as:

- a) $y = -3x + 2$
- b) $y = 3x - 2$
- c) $y = -1/3x + 2$
- d) $y = 1/3x - 2$

16. What is the value of $\tan(\pi/4)$?

- a) 1
- b) $\sqrt{2}$
- c) 0
- d) -1

17. The derivative of $f(x) = 4x^2 + 3x - 2$ is:

- a) $8x + 3$
- b) $8x - 3$
- c) $4x + 3$
- d) $4x - 3$

18. The integral of $\int (2x^2 - 3x + 4) dx$ is:

- a) $(2/3)x^3 - (3/2)x^2 + 4x + C$
- b) $(2/3)x^3 - (3/2)x^2 - 4x + C$
- c) $2x^3 - (3/2)x^2 + 4x + C$
- d) $2x^3 - (3/2)x^2 - 4x + C$

19. The area under the curve $y = x^2$ from $x = -1$ to $x = 1$ is:

- a) $1/3$
- b) $2/3$
- c) $4/3$
- d) $8/3$

20. The determinant of a 4×4 matrix can be found using:

- a) Cramer's Rule
- b) Gaussian Elimination
- c) Inverse Matrix Method
- d) Laplace Expansion

21. What is the purpose of statistical data collection?

- A) To store data in databases
- B) To gather information and analyze it for interpreting and making conclusions
- C) To generate random numbers
- D) To display data in charts and graphs

22. Which of the following is NOT a type of statistical data collection?

- A) Experimental data collection
- B) Sampling data collection
- C) Census data collection
- D) Logical data collection

23. Which of the following is a measure of dispersion used in statistics?

- A) Percentile
- B) Median
- C) Standard deviation
- D) Histogram

24. What is the objective of summarizing data in statistics?

- A) To collect as much numerical data as possible
- B) To present the main features of a dataset in a concise and meaningful way
- C) To identify outliers in a dataset
- D) To perform advanced statistical analysis

25. What is Python programming commonly used for?

- A) Data analysis, web development, and automation
- B) Hardware engineering
- C) Graphic design
- D) Video game development

26. Which of the following is NOT a data type in Python?

- A) String
- B) Integer
- C) Index
- D) Boolean

27. What is the purpose of using variables in Python programming?

- A) To store and manipulate data during program execution
- B) To display output on the screen
- C) To define functions and classes
- D) To import external libraries

28. What does the 'print()' function do in Python?

- A) It reads input from the user
- B) It displays the specified message or value on the screen
- C) It performs mathematical operations
- D) It creates a new variable

29. What is the output of the following code in Python?

```
numbers = [1, 2, 3, 4, 5]  
print(sum(numbers))
```

- A) -15
- B) 120
- C) 15
- D) 5

30. Which of the following operators is used to perform exponentiation in Python?

- A) //
- B) ^
- C) *
- D) **

31. What is the purpose of a loop in Python programming?

- A) To make decisions based on conditions
- B) To repeat a set of instructions multiple times
- C) To store a collection of values
- D) To calculate complex mathematical equations

32. What does the 'len()' function do in Python?

- A) It converts a value to an integer data type
- B) It returns the number of elements in a sequence or the length of a string
- C) It calculates the logarithm of a number
- D) It generates a random number

33. Which Python keyword is used to exit a loop prematurely?

- A) continue
- B) return
- C) pass
- D) break

34.What is the output of the following code in Python?

```
for i in range(5):
```

```
    print(i)
```

```
else:
```

```
    print('Loop finished')
```

A) 0 1 2 3 4

Loop finished

B) Loop finished

C) 0 1 2

Loop finished

D) 5 6 7 8 9

Loop finished

35.What is the purpose of business process automation?

A) To increase manual work and improve communication within an organization

B) To decrease efficiency by relying on outdated processes

C) To disrupt business operations and hinder productivity

D) To streamline and optimize business operations through the use of technology

36.Which statement best describes the basics of coding?

A) Coding is only used in the development of web applications

B) Coding is the process of automating business processes

C) Coding involves writing instructions for computers to perform specific tasks

D) Coding is a creative process used to design web pages

37.In the context of web development, what does 'HTML' stand for?

A) Home Tool Management Language

B) Hyper Texturing Markup Library

C) Highly Textual Markup Language

D) Hypertext Markup Language

38.Which programming language is commonly used for developing web pages?

A) C++

B) Java

C) JavaScript

D) Python

39.What is the purpose of an ERP system?

- A) To simplify individual department operations by reducing collaboration
- B) To create organizational chaos by introducing complex systems
- C) To limit the scale and growth potential of an organization
- D) To integrate and automate business processes across multiple departments

40.What role does design play in the development of web pages?

- A) Design only deals with backend development tasks
- B) Design is irrelevant to the overall development process
- C) Design focuses on creating user-friendly interfaces and visually appealing content
- D) Design primarily concerns itself with business process automation

41.Which programming language is considered the backbone of most web development?

- A) JavaScript
- B) CSS
- C) HTML
- D) Python

42.What does 'CSS' stand for in web development?

- A) Client-Side Scripting
- B) Cascading Style Sheets
- C) Content Security System
- D) Computer System Services

43.How does automation benefit business processes?

- A) Automation often leads to significant financial losses
- B) Automation diminishes employee satisfaction and engagement
- C) Automation improves efficiency, reduces errors, and increases productivity
- D) Automation increases manual work and slows down operations

44.What is the primary goal of streamlining business operations?

- A) To eliminate redundancies and optimize processes for maximum efficiency
- B) To complicate operations and introduce unnecessary complexities
- C) To hinder collaboration and limit growth potential
- D) To promote inefficiencies and waste organizational resources

45. Which aspect focuses on the appearance and layout of web pages?

- A) User Interface (UI) design
- B) Back-end development
- C) Business analysis
- D) Database management

46. What is another term commonly used for 'business process automation'?

- A) Workflow automation
- B) Task simplification
- C) Employee engagement
- D) Strategic planning

47. In relation to web pages, what does 'PHP' stand for?

- A) Personal Homepage
- B) Packet Handling Protocol
- C) Public Hosting Provider
- D) Hypertext Preprocessor

48. Which term refers to the process of improving the visibility of a web page in search engine results?

- A) Customer Relationship Management (CRM)
- B) Search Engine Optimization (SEO)
- C) Content Management System (CMS)
- D) User Experience (UX) Design

49. What does 'FTP' stand for in the context of web development?

- A) Friendly Technology Provider
- B) Form Testing Process
- C) Faster Text Processing
- D) File Transfer Protocol

50. What is the primary purpose of coding in the context of web development?

- A) To test the functionality of the website
- B) To make the web page more visually appealing
- C) To enhance the user experience on the website
- D) To instruct the computer to perform specific tasks or calculations

51. Why is it important to design and develop web pages that are user-friendly?

- A) To ensure that visitors can easily navigate and use the website
- B) To reduce the loading time of web pages on different devices
- C) To improve the website's search engine rankings
- D) To prevent unauthorized access to sensitive information

52.What is the main purpose of business process automation in an ERP system?

- A) To streamline and optimize repetitive tasks and workflows
- B) To enhance the security measures of the ERP system
- C) To generate comprehensive reports for decision making
- D) To improve communication and collaboration among employees

53.Which statement best describes ERP (Enterprise Resource Planning)?

- A) An integrated software system that manages core business processes
- B) A design pattern commonly used in website layouts
- C) A programming language used for web development
- D) A methodology for optimizing business automation processes

54.What is the role of coding in business process automation?

- A) To automate manual tasks and enable efficient data processing
- B) To optimize resource planning and allocation in an organization
- C) To define and manage user roles and permissions in an ERP system
- D) To create visually appealing interfaces for ERP systems

55.What skillset is essential for a web developer to design and develop web pages?

- A) Expertise in graphic design and multimedia content creation
- B) Experience in project management and database administration
- C) Strong knowledge of marketing strategies and SEO techniques
- D) Proficiency in programming languages, HTML, CSS, and JavaScript

56.In web development, what is the purpose of CSS (Cascading Style Sheets)?

- A) To control the visual appearance and layout of web pages
- B) To establish server-client communication for real-time updates
- C) To store and organize data in a structured manner
- D) To create dynamic and interactive elements on web pages

57.What is the primary focus of User Interface (UI) design in web development?

- A) To ensure the website is accessible and user-friendly
- B) To optimize the website's speed and responsiveness
- C) To create an intuitive and visually appealing interaction between users and the website
- D) To improve the ranking of web pages in search engine results

58. Why is it important to thoroughly test web pages before deploying them on the internet?

- A) To ensure compatibility with all web browsers and devices
- B) To protect sensitive data from cybersecurity threats
- C) To improve the overall performance and scalability of the website
- D) To identify and fix any potential bugs or usability issues

59. What are the primary benefits of implementing an ERP system in a business?

- A) Increased brand recognition and online visibility
- B) Enhanced customer engagement and satisfaction
- C) Reduced maintenance and hardware costs
- D) Improved operational efficiency, streamlined processes, and centralized data management

60. What is the difference between front-end and back-end web development?

- A) Front-end involves database management, while back-end handles graphic design
- B) Front-end emphasizes performance optimization, while back-end concentrates on security
- C) Front-end focuses on user-facing elements, while back-end deals with server-side functionality
- D) Front-end is related to web design, while back-end pertains to content creation

61. Which programming language is commonly used for server-side web development?

- A) HTML
- B) JavaScript
- C) PHP
- D) Python

62. What does ERP stand for in the context of business automation systems?

- A) Enhanced Robotic Processing
- B) Electronic Records Preservation
- C) Efficient Resource Provisioning
- D) Enterprise Resource Planning

63. What feature allows businesses to integrate various departments and functions in an ERP system?

- A) Integration with external tools and third-party applications
- B) Centralized data management and real-time data sharing
- C) Data encryption and secure access control
- D) Automated financial reporting and forecasting

64. When it comes to web development, what does UX stand for?

- A) Universal Execution
- B) User Interface
- C) Uniformed XML
- D) User Experience

65.What is the term used to describe the protection against unauthorized access to computer systems or data?

- A) Phishing
- B) Cybersecurity
- C) Encryption
- D) Malware

66.Which of the following is NOT a common type of cyber attack?

- A) Authentication
- B) Phishing
- C) Ransomware
- D) Denial of Service

67.What is the process through which data is made unreadable by encrypting it using a specific code or key?

- A) Encryption
- B) Backdoor
- C) Firewall
- D) Spoofing

68.Which of the following refers to the practice of tricking individuals into providing sensitive information such as passwords or credit card details?

- A) Spyware
- B) Phishing
- C) Hacking
- D) Spyware

69.What is a software program that is designed to disrupt, damage, or gain unauthorized access to computer systems?

- A) Authentication
- B) Encryption
- C) Malware
- D) Firewall

70.Which of the following refers to the unauthorized copying, distribution, or use of digital media such as software or music without proper permission?

- A) Denial of Service
- B) Spoofing
- C) Piracy
- D) Ransomware

71.What is a forged or falsified email in which the sender pretends to be from a reputable source for malicious purposes?

- A) Cybersecurity
- B) Hacking
- C) Backdoor
- D) Spoofing

72.Which of the following is a preventive security measure designed to block unauthorized access to a computer network?

- A) Malware
- B) Encryption
- C) Phishing
- D) Firewall

73.What type of cyber attack involves crashing a computer network or service by overwhelming it with a flood of internet traffic?

- A) Piracy
- B) Authentication
- C) Denial of Service
- D) Ransomware

74.What is a secret pathway or program within a computer system that allows hackers to gain unauthorized access and control over the system?

- A) Backdoor
- B) Spyware
- C) Firewall
- D) Authentication

75.Which of the following refers to the process of searching and analyzing vast amounts of data to uncover patterns, trends, and insights?

- A) Malware
- B) Ransomware
- C) Phishing
- D) Data mining

76.What is a form of cyber attack where an attacker requests a ransom in exchange for decrypting and restoring access to locked data?

- A) Spoofing
- B) Ransomware
- C) Encryption
- D) Denial of Service

77.Which of the following is a situation in which a computer application or system seems to be functioning correctly while being used, but is actually performing unauthorized tasks in the background?

- A) Trojan horse
- B) Firewall
- C) Phishing
- D) Cybersecurity

78.What is the process of deliberately accessing, manipulating, or damaging someone's online reputation through false information or rumors?

- A) Cyber defamation
- B) Piracy
- C) Malware
- D) Spoofing

79. Which of the following refers to securing the physical devices (e.g., laptops, smartphones) and physical spaces where data is stored to prevent unauthorized access?

- A) Data mining
- B) Backdoor
- C) Encryption
- D) Physical security

80. What is the minimum distance required between high voltage and low voltage equipment?

- A) 5 meters
- B) 2 meters
- C) 4 meters
- D) 3 meters

81. Which of the following is the most common cause of electrical fires?

- A) Equipment malfunctions
- B) Improper grounding
- C) Faulty wiring
- D) Overloaded circuits

82. What is the function of an earth leakage circuit breaker?

- A) To prevent power surges
- B) To supply emergency backup power
- C) To compensate for power fluctuations
- D) To detect small current leakages

83. What does RCD stand for?

- A) Reactive Current Detector
- B) Residual Current Device
- C) Rapid Circuit Disconnect
- D) Responsibility Consideration Directorate

84. What is the purpose of a fuse?

- A) To prevent power surges
- B) To amplify electrical signals
- C) To regulate voltage output
- D) To protect against excessive current

85. What safety precautions should be taken while working with electrical appliances?

- A) Wear metal jewelry
- B) Avoid using gloves
- C) Have wet hands
- D) Use insulated tools

86. What happens if an electrical wiring circuit is not properly grounded?

- A) Reduced electrical resistance
- B) Increased power supply
- C) Enhanced energy efficiency
- D) Risk of electric shock

87. Which of the following should not be used for electrical wiring?

- A) Silver
- B) Copper
- C) Aluminum
- D) Gold

88. What is the purpose of a surge protector?

- A) To protect against voltage spikes
- B) To regulate current flow
- C) To extend battery life
- D) To reduce power consumption

89. What safety measure should you take before working on electrical circuits?

- A) Ensure all circuit breakers are in 'on' position
- B) Switch off the main power supply
- C) Unplug only the specific equipment being worked on
- D) Leave the power supply on for testing purposes

90. What is the purpose of bonding in electrical installations?

- A) To prevent electric shock
- B) To enhance electrical conductivity
- C) To increase voltage levels
- D) To reduce power losses

91. What is the main purpose of protective devices in an electrical circuit?

- A) To prevent damage or injury from electrical faults
- B) To enhance the power output of the circuit
- C) To regulate the flow of electricity
- D) To increase the efficiency of electricity usage

92. Which of the following is NOT a function of a fuse in an electrical circuit?

- A) To control the voltage level
- B) To interrupt the circuit during a fault
- C) To protect against overcurrent
- D) To provide a sacrificial element

93. What type of circuit breaker uses air as the medium for arc extinction?

- A) Magnetic circuit breaker
- B) Thermal circuit breaker
- C) Oil circuit breaker
- D) Air circuit breaker

94. Which of the following is used to extinguish the arc in a high-voltage electrical circuit breaker?

- A) Fuse links
- B) Special arc-extinguishing devices
- C) Electromagnetic coils
- D) Thermal devices

95. In DC machines, armature reaction refers to the effect of ____.

- A) Field magnetic flux on armature current
- B) Armature temperature on field current
- C) Armature voltage on field flux
- D) Armature resistance on overall machine efficiency

96. In a three-phase induction motor, the stator winding is ____.

- A) Rotating along with the rotor
- B) Externally excited
- C) Fixed and stationary
- D) Directly connected to the power source

97. What happens when the negative terminal of a battery is connected to the positive terminal of another battery?

- A) The batteries form a series connection
- B) The batteries short-circuit
- C) The batteries repel each other
- D) The batteries form a parallel connection

98. In the context of electronic devices, what does the acronym 'LED' stand for?

- A) Low-end electronic device
- B) Liquid electrolyte dispenser
- C) Light-emitting diode
- D) Longitudinal energy detector

99. Which of the following is a characteristic of digital signal processing?

- A) Single phase analysis
- B) Continuous representation of signals
- C) Analog to digital conversion
- D) High-speed computation using algorithms

100. What is the primary purpose of a flip-flop circuit in digital electronics?

- A) To amplify analog signals
- B) To perform mathematical calculations
- C) To store one bit of binary information
- D) To generate clock pulses

| MODEL QUESTION PAPER-2/KEY ANSWERS | | | | | | | | | |
|------------------------------------|---|----|---|----|---|----|---|-----|---|
| 1 | B | 21 | B | 41 | C | 61 | C | 81 | C |
| 2 | A | 22 | D | 42 | B | 62 | D | 82 | D |
| 3 | D | 23 | C | 43 | C | 63 | B | 83 | B |
| 4 | A | 24 | B | 44 | A | 64 | D | 84 | D |
| 5 | A | 25 | A | 45 | A | 65 | B | 85 | D |
| 6 | B | 26 | C | 46 | A | 66 | A | 86 | D |
| 7 | C | 27 | A | 47 | D | 67 | A | 87 | C |
| 8 | D | 28 | B | 48 | B | 68 | B | 88 | A |
| 9 | A | 29 | C | 49 | D | 69 | C | 89 | B |
| 10 | B | 30 | D | 50 | D | 70 | C | 90 | A |
| 11 | A | 31 | B | 51 | A | 71 | D | 91 | A |
| 12 | A | 32 | B | 52 | A | 72 | D | 92 | A |
| 13 | C | 33 | D | 53 | A | 73 | C | 93 | D |
| 14 | B | 34 | A | 54 | A | 74 | A | 94 | B |
| 15 | C | 35 | D | 55 | D | 75 | D | 95 | A |
| 16 | A | 36 | C | 56 | A | 76 | B | 96 | C |
| 17 | C | 37 | D | 57 | C | 77 | A | 97 | D |
| 18 | A | 38 | C | 58 | D | 78 | A | 98 | C |
| 19 | C | 39 | D | 59 | D | 79 | D | 99 | D |
| 20 | A | 40 | C | 60 | C | 80 | D | 100 | C |