Tribhuvan University
Faculty of Humanities and Social Sciences
Office of the Dean
Master of Computer Application (MCA)
Entrance Examination

Format of the Entrance Test Paper

1. The duration of the Entrance Exam will be 2 hours.
2. The question paper will consist of 100 multiple choice questions with four options.
3. There will be no negative marking.
4. Calculators will not be allowed. However, Log Tables may be used.

Syllabus for Entrance Test

1. Mathematics & Statistics: 20 marks
2. Data Structure and Algorithms: 10 marks
3. Object Oriented Programming: 10 marks
4. System Analysis and Design: 5 marks
5. Software Engineering: 5 marks
6. Computer Organization and Architecture: 5 marks
7. Operating System: 10 marks
8. Database Management System: 10 marks
9. Web Technology: 5 marks
10. Computer Network: 10 marks
11. Cloud Computing: 5 marks
12. Emerging trends in computer applications: 5 marks

Detailed content and reference materials are similar to the content mentioned in syllabus of TU, FoHSS, BCA Program for above specified subjects.

Model Questions

Tribhuvan University
Faculty of Humanities and Social Sciences
Office of the Dean
Master of Computer Application (MCA)
Entrance Examination

Time: 2 hours

Full Marks: 100
Pass Marks: 50

Circle (O) the correct answer.

1. If n(U)=100, n(A)=70, and n(B)=40 then the maximum value of n($A \cap B$) is

   a)40   b) 70   c) 100   d) 110

2. If $6 + 4x \leq 12$ then the value of x is

   a) $x \leq \frac{1}{2}$ b) $x \leq 1$ c) $x \leq \frac{2}{3}$ d) $x \leq \frac{3}{2}$

3. If $a + ib = \sqrt{\frac{1+i}{1-i}}$ then the value of a is

   a) $\frac{2}{3}$ b) $\frac{2}{\sqrt{3}}$ c) $\frac{1}{2}$ d) $\frac{1}{\sqrt{2}}$

4. Inverse of the function $f(x) = 3x + 5$ is

   a) $3x - 5$ b) $5x - 3$ c) $\frac{x-5}{3}$ d) $\frac{x-3}{5}$

5. Value of the function $f(x) = \log_a a^x$ is equal to

   a) a^x b) x^a c) a^{-x} d) x

6. Slope of the curve $y = \frac{1}{x}$ at $x = a$ is

   a) a^2 b) $\frac{1}{a^2}$ c) $-\frac{1}{a^2}$ d) $-\frac{1}{a}$

7. The absolute maximum value of the function $f(x) = x^2$ on [-2, 1] is

   a) -2   b) 0   c) 1   d) 4

8. If a function $y = f(x)$ satisfies all the conditions of Rolle's theorem, then the tangent at a point c ϵ (a, b) is

   a) Parallel to y axis   b) Parallel to x axis

   c) Parallel to the line joining a and b.   d) perpendicular to the line joining a and b.

9. Integration of the function $\int \log x \, dx$ is equal to

   a) $x \log x - 1$ b) $x \log x + 1$ c) $\log x - 1$ d) $\log x + 1$

10. The curve $y = x^2$ is symmetric about

a) x axis   b) y axis   c) about the line $y = x$ d) about the line $y =- x$

11. How many types of data are there on the basis of sources of data collection?

    a) One   b) Two   c) Three   d) Four

12. Which is suitable central tendency to find the average of ready-made garments?

    a) Arithmetic mean   b) Median   c) Mode   d) All of above

13. What is the minimum value of Correlation?

    a) 5   b) 0   c) -1   d) 0.5

14. If r=0.2 then coefficient of determination implies that

    a) 20% of total variation in dependent variable has been explained by independent variable.

    b) 40% of total variation in dependent variable has been explained by independent variable.

    c) 2% of total variation in dependent variable has been explained by independent variable.

    d) 4% of total variation in dependent variable has been explained by independent variable.

15. What is the maximum value of Probability in percentage?

    a) 1   b) 100%   c) 1%   d) None of above

16. In case of Poisson distribution

    a) Mean > Variance   b) Mean = Variance   c) Mean $\leq$ Variance d) Mean $\geq$ Variance

17. How do you determine sample size if level of significance and power of test is known?

    a) $\dfrac{(\sigma(Z_{1-\beta}+Z_{1-\alpha}))^2}{(\mu_{1-\mu_2})^2}$ b) $\dfrac{Z_{\alpha/2}^2 PQ}{d^2}$ c) none of above   d) both of above

18. The variance of t-distribution is

    a) $\dfrac{n}{n-2}$ b) $\dfrac{n}{n-1}$

    c) $\dfrac{n}{n-3}$ d) $\dfrac{n}{n-1^2}$

19. How do you obtain degree of freedom in one way ANOVA?

    a) (k, n-1)   b) (k, n-k)

    c) (k-1, n-1)   d) k-1, n-k)

20. In case of ANOVA, C.F. can be obtained as:

a) $\frac{T}{n}$ 　　　　　　　　　　　　　　b) $\frac{T^2}{n-1}$

c) $\frac{T}{n-1}$ 　　　　　　　　　　　　d) $\frac{T^2}{n}$

21. Which of the following data structure is non-linear?

    a) Queue 　　　　　b) Stack 　　　　　c) Linked List 　　　d) Tree

22. What is the overflow condition in stack?
    a) top==MAXSIZE 　b) top=MAXSIZE-1 　c) top==-1 　　　d) top==0

23. Which of the following type of linked list does not contain NULL pointer?
    a) Singly linked list 　　　　　　b) Doubly linked list
    c) Circular linked list 　　　　　d) Multiple linked list

24. Which of the following data structure can be used to remove recursions?
    a) Stack 　　　　　b) Queue 　　　　　c) Linked list 　　　d) Tree

25. What is the worst-case time complexity of selection sort?
    a) $O(n)$ 　　　　　b) $O(n^2)$ 　　　　c) $O(nlogn)$ 　　d) $O(nlogn^2)$

26. _____ are non-contiguous.
    a) Arrays 　　　　b) Linked Lists 　　　c) Stack 　　　　　d) Queue

27. The postfix form of A*B+C/D is _____.
    a) AB*CD/+ 　　　b) ABCD+/* 　　　c) *AB/CD+ 　　　d) A*BC+/D

28. Which of the following is an external sorting?
    a) Bubble sort 　　b) Insertion sort 　　c) Selection sort 　d) Merge sort

29. What is the best-case time complexity of merge sort?

    a) $O(n)$ 　　　　　b) $O(n^2)$ 　　　　c) $O(nlogn)$ 　　d) $O(1)$

30. Which of the following in not hash function?
    a) Linear probing 　b) Folding 　　　c) remainder division 　d) mid square

31. The code generated after compiling a Java program is called

    a) Source code 　　b) Byte code 　　c) Machine code 　d) All of the above

32. Which one of the following is primitive data type in Java?

    a) float 　　　　　b) Float 　　　　　c) Double 　　　　d) Both b and c

33. Which one of the following is not a valid identifier in Java?

    a) _123var 　　　　b) Var123 　　　　c) -123var 　　　　d) Var_123

34. Which one of the following is bitwise operator?

    a) && 　　　b) || 　　　c) + 　　　d) &

35. Which one of the following is entry-controlled loop?

    a) For 　　　　　　b) While 　　　　　c) Do-while 　　　d) Both a and b

36. Which one of the following concepts is used when an object is passed to a method?

    a) By value 　　　b) By reference 　　c) By pointer 　　d) All of the above

37. Defining different methods with the same name but with different parameters (either parameter type or number of parameters) within a class is called

a) Inheritance b) Abstraction c) Method overloading d) Method overriding

38. Which one of the following is true in Java?

a) A class can extend any number of super classes

b) A class can extend any number of interfaces

c) A class can extend only one super class

d) None of the above

39. Which one of the following is true for abstract classes?

a) Abstract classes cannot be instantiated

b) Abstract classes can be instantiated

c) Abstract classes cannot be inherited

d) Abstract classes are same as interfaces

40. Which one of the following Java packages contains String class?

a) java.awt   b) java.lang   c) java.swing   d) javax.swing

41. The outcome of the analysis phase is the:

a) Feasibility Analysis document   b) System proposal document

c) System specification document   d) System request document

42. In the SDLC (Systems Development Life Cycle), what comes after the analysis phase?

a) Approval phase   b) Design phase

c) Development phase   d) Implementation phase

43. The primary objective of the systems analyst is to:

a) Create value for the organization   b) Create a system proposal

c) Determine ROI   d) Assess risk for the project

44. Rita is preparing an economic feasibility study. She is calculating the payback period. It means She is calculating:

a) Cash flow   b) ROI   c) Break-even point   d) Net present value

45. Which of the following methodology might be most appropriate if you have a system project

with clear requirements; very familiar technologies; not all that complex; reasonably reliable; a very long-time schedule and the schedule visibility is not important.

a) Waterfall   b) Parallel   c) Iterative   d) System prototyping

46) Which three framework activities are present in Adaptive Software Development?

    a) Analysis, Design and Coding

    b) Requirement gathering, Adaptive Cycle Planning, Iterative development

    c) Speculation, Collaboration, Learning

    d) All of the above

47) User requirements are expressed as ………….. in Scrum method.

    a) implementation tasks b) functionalities c) product backlog d) none of the above

48) Which one of the following is not a step of requirement engineering?

    a) elicitation   b) design   c) analysis   d) documentation

49) Which one of the following is a functional requirement?

    a) Maintainability   b) Portability   c) Robustness   d) None of the mentioned

50) The agile software development model is built based on _____.

    a) Linear Development   b) Incremental Development

    c) Iterative Development   d) Both Incremental and Iterative Development

51. What is the size of program counter in basic computer?

    a) 24   b) 16   c) 8   d) 12

52. How many selection lines are used in basic computer to determine specific output for the bus lines at any given time?

    a) 4   b) 2   c) 3   d) 5

53. Which operation is performed during T 1 of the fetch cycle?

    a) AR<-PC   b) IR <- M[AR]

    c) PC<-PC + 1, AR<-PC   d) IR <- M[AR], PC<-PC + 1

54. Which computer Architecture primarily contain hardwired control unit?

    a) Intel   b) RISC   c) CISC   d) IBM

55. What is the size of address bus in 8085 microprocessor?

    a) 8 bits   b) 16 bits   c) 20 bits   d) 32 bits

56. Which of the following is responsible for allocating the CPU to the process picked up from the ready queue?

    a) Dispatcher   b) Scheduler   c) Thread   d) CPU

57. To speed up processing, jobs with the same needs are grouped together and executed called _____.

    a) multi-programming   b) multi-processing

    c) Batch processing   d) parallel processing

58. _____ serves as a repository of information about a process and varies from process to process.

    a) Scheduling Block   b) Process Control Block

    c) Thread Control Block   d) User Control Block

59. The interval of time between submission and completion of a process is called_____.

    a) Dispatch time   b) turnaround time   c) execution time   d) waiting time

60. A process waiting for a currently unavailable resource is said to be _____.

    a) Blocked   b) Terminated   c) Executed   d) Waiting

61. Which of the following is the non-preemptive scheduling algorithm?

    a) FCFS   b) SJF   c) Round-robin   d) SRTF

62. When resources have multiple instances, _____ is used for deadlock Avoidance.

    a) Resource allocation graph   b) Banker's algorithm

    c) Process allocation graph   d) Multiple allocation graph

63. CPU switching from one process to another requires saving the state of the current process and loading the latest state of the next process is called ____.

    a) Task switching   b) Process reloading

    c) Context switching   d) Inter-process switching

64. _____ algorithm requires each process to make in advance the maximum number of resources of each type that it may need.

    a) Deadlock detection   b) Deadlock avoidance

    c) Deadlock termination   d) Deadlock recovery

65. A system is said to be in a ____state if it can allocate resources upto the maximum available resources.

a) deadlocked b) reusable c) safe d)unsafe

66. Which of following is used to ensure minimizing the insertion, deletion, and update anomalies?

   a) Anomalization b) Minimization c) ER Design d) Normalization

67. Which of following defines actual content of database at a particular time?

   a) Database Instance b) Physical Schema c) Logical Schema d) Entity

68. Which of following defines attributes that are made up of one or more attributes?

   a) Null valued b) Derived c) Multivalued d) Composite

69. Which of following is used to uniquely identify the tuples in a relational table?

   a) Primary Key b) Foreign Key c) Secondary Key d) Tuple Key

70. Which of following join requires that the two join attributes, or each pair of corresponding join attributes, have the same name in both relations?

   a) Theta Join b) Outer Join c) Natural Join d) Cartesian Join

71. In ………….. lock mode, more than one transaction can apply the lock on a data item X

for reading its value but no write lock can be applied on X by any other transaction.

   a) Exclusive b) Shared c) Two Phase d) Inclusive

72. Which of following can be thought of as a 'daemon' that monitors a database, and is

executed when the database is modified in a way that matches the event specification?

   a) Stored Procedure b) Audit c) Trigger d) Monitor

73. By default, the order by clause in SQL lists items in ………………… order

   a) descending b) same c) random d) ascending

74. Which SQL query is used to remove a table and all its data from the database?

   a) create table b) drop table c) alter table d) delete table

75. …………. defines that same entity may be the member of more than one subclass.

   a) Disjointness b) Multi Subclass c) Overlap d) General Subclass

76. Which of the following can read and render HTML web page

   a) Server. b) Browser c) Database d) None of the above

77. On which model is WWW based upon

   a) Localhost b) 3 tier c) Client server d) None of the above

78. Why XPATH is used?

a) To address server   b) To store IP address of the server

c) To address the document by specifying a location path   d) None of them

79. HTML is a subset of

a) SGML   b) XML   c) XSLT   d) XHTML

80. Symbol used at the beginning of the HREF to point location of same page

a) #   b) $ c) &   d) ^

81. What is the size of IPv6?

a) 2 bytes   b) 4 bytes   c) 8 bytes   d) 16 bytes

82. What is the size of MAC Address?

a) 4 bytes   b) 5 bytes   c) 6 bytes   d) 8 bytes

83. Which of the following network layer device?

a) Router   b) Modem   c) Hub d) NIC

84. Which of the following is invalid IP address?

a) 192.168.1.01   b) 192.168.1.1   c) 192.168.1.10   d) 192.168.192.168

85. Which one of the following port number is used by SNMP protocol?

a) 80   b) 21   c) 161   d) 137

86. What is the meaning of 10base5?

a) 10 mbps upto 500 meter   b) 5 mbps upto 1000 meter

c) 10 gbps upto 500 meter   d) 5 gbps upto 1000 meter

87. What is the size of sequence number in TCP header?

a) 8 bits   b) 16 bits   c) 24 bits   d) 32 bits

88. Which of the following is not a type of firewall?

a) Packet-filtering firewall   b) Circuit-level gateway

c) Stateful Inspection firewall   d) Network firewall

89. Which of the following is random access protocol?

a) ALOHA   b) TDMA

c) Token Passing   d) Reservation

90. Which of the following is not symmetric key algorithm?

a) DES   b) IDEA   c) RSA   d) 3-DES

91. Which one of the following is Cloud Platform by Amazon?

a) Azure   b) AWS   c) Cloudera   d) All of the mentioned

92. Cloud computing architecture is a combination of?

a) service-oriented architecture and grid computing

b) Utility computing and event-driven architecture.

c) Service-oriented architecture and event-driven architecture.

d) Virtualization and event-driven architecture

93. Which one of the following refers to the user's part of the Cloud Computing system?

a) Back End   b) Management   c) Infrastructure   d) Front End

94. Which of the following is one of the backend's built-in components of cloud computing?

a) Security   b) Application c) Storage   d) Service

95. Which one of the following given programs provides the isolation (abstraction) and

partitioning?

a) System hypervisor   b) Software hypervisor

c) Hardware hypervisor   d) Virtualization hypervisor

96. Who is the pioneer of Artificial Intelligence?

a) Geoffrey Hinton   b) Andrew Ng c) John McCarthy   d) Jurgen Schmidhuber

97. Which of the following machine requires input from the humans but can interpret the outputs themselves?

a) Actuators   b) Sensor   c) Agents   d) AI system

98. Which of the of the following is machine learning algorithm?

a) supervised learning algorithm   b) unsupervised learning algorithm

c) re-enforced learning algorithm   d) all of above

99. what is the full form of ChatGPT?

a) Chat Generative Pre-trained Transformer b) Chat Generative Pre-trained Translator

c) Chat Generative Pre-Processed Transformer d) Chat General Pre-trained Transformer

100. 'Siri' virtual assistant does not belong to ….

a) iOS   b) tvOS   c) Android OS   d) macOS