1. What is the converse of the following assertion? I stay only if you go.
   a) I stay if you go
   b) If I stay then you go
   c) If you do not go then I do not stay
   d) If I do not stay then you go

2. The set {1, 2, 4, 7, 8, 11, 13, 14} is a group under multiplication modulo 15. The inverse of 4 and 7 are respectively
   a) 3 and 13
   b) 2 and 11
   c) 4 and 13
   d) 8 and 14

3. What is the possible number of reflexive relations on a set of 5 elements?
   a) 2^{10}
   b) 2^{15}
   c) 2^{20}
   d) 2^{25}

4. what is the size of the smallest MIS (Maximal Independent Set) of a chain of nine nodes ?
   a) 5
   b) 4
   c) 3
   d) 2

5. which of the following regular expression identifies are true ?
   a) r(*) = r*
   b) (r *s *)* = (r + s) *
   c) (r+ s *)* = r *+s *
   d) (r * s *)* = r *+s *

6. the string 1101 does not belongs to the set represented by
   a) 110 * (0+1)
   b) 1(0+1)*101
   c) (10)*(01)*(00+11)*
   d) (00+(11)*0)*

7. Given an arbitrary non-deterministic finite automaton (NFA) with N states, the maximum number of states in an equivalent minimized DFA is at least
   a) N^2
   b) 2^n
   c) 2N
   d) N!

8. Which of the following statement about regular language is NOT true ?

a) Every language has a regular superset
b) Every language has a regular subset
c) Every subset of a regular language is regular
d) Every subset of a finite language is regular

9. Which of the construction could lead to non-regular language?
a) Both I and IV
b) Only I
c) Only IV
d) Both II and III

10 . Which of the following addressing method does the instruction, MOV AX,[BX] represent?
a) Register indirect addressing mode
b) direct addressing mode
c) register addressing mode
d) register relative addressing mode

11 . Which of the following is the correct sequence of operations in a microprocessor?
a) Opcode fetch, memory read, memory write, I/O read, I/O write
b) Opcode fetch, memory write, memory read, I/O read, I/O write
c) I/O read, opcode fetch, memory read, memory write, I/O write
d) I/O read, opcode fetch, memory write, memory read, I/O write

12 The mode that is used to interrupt the processor by setting a suitable terminal count is
a) mode 0
b) mode 1
c) mode 2
d) mode 3

13 Which is of the following is true about SPHL instruction?
a) It uses indexed addressing mode
b) It is a 3-byte instruction
c) It requires three T-states
d) Contents of HL pair is moved to SP

14 For m = 1, 2, …, 4m+2 is a multiple of _____
a) 3
b) 5
c) 6
d) 2

15 By induction hypothesis, the series $1^2 + 2^2 + 3^2 + \ldots + p^2$ can be proved equivalent to
_____
a) [p2+2]/7
b) [p*(p+1)*(2p+1)]/6
c) [p*(p+1)]/4
d) $p+p^2$

16. The least number of computers required to connect 10 computers to 5 routers to guarantee 5 computers can directly access 5 routers is _____

    a) 74

    b) 104

    c) 30

    d) 67

17. The maximum number of edges in a bipartite graph on 14 vertices is _____

    a) 56

    b) 14

    c) 49

    d) 87

18. Which of the following concept of FSA is used in the compiler?

    a) Code optimization

    b) Code generation

    c) Lexical analysis

    d) Parser

19. Which of the following is correct regarding an optimizer Compiler?

    a) Optimize the code

    b) Is optimized to occupy less space

    c) Both of the mentioned

    d) None of the mentioned

20. Which of the following technique is used for building cross compilers for other machines?

    a) Canadian Cross

    b) Mexican Cross

    c) X-cross

    d) Brazilian Cross

21. Which grammar violates rules of an operator grammar?

(i) P-> QR

(ii) P -> Q s R

(iii) P -> ε

(iv) P ->Q t

a)(i) only

b) (i) and (iii) only

c) (ii) and (iii) only
d) (iii) and (iv) only

22. The DBMS acts as an interface between _____ and _____ of an enterprise-class system.

a) Data and the DBMS   b) Application and SQL

c) Database application and the database   d) The user and the software

23. Which of the following schemas does define a view or views of the database for particular users?

a) Internal schema   b) Conceptual schema

c) Physical schema   **d) External schema**

24 . Which of the following terms does refer to the correctness and completeness of the data in a database?

a) Data security   b) Data constraint

c) Data independence   **d) Data integrity**

25. Which of the following is a concurrency control problem?

a) lost update   b) dirty read

c) unrepeatable read   **d) All of the above**

26. Which of the following declaration is not supported by C language?

   a) String str;

   b) char *str;

   c) float str = 3e2;

   d) Both "String str;" and "float str = 3e2;"

 27.

   #include <stdio.h>

   enum birds {SPARROW, PEACOCK, PARROT};

   enum animals {TIGER = 8, LION, RABBIT, ZEBRA};

   intmain()

   {

   enumbirds m = TIGER;

```
int k;

 k = m;

printf("%d\n", k);

 return 0;

 }
```

28. What are the elements present in the array of the following C code?

intarray[5] = {5};

a) 5, 5, 5, 5, 5

b) 5, 0, 0, 0, 0

c) 5, (garbage), (garbage), (garbage), (garbage)

d) (garbage), (garbage), (garbage), (garbage), 5

29. Size of the union is determined by the size of

a) First member   **b) Largest Member**

c. Sum of size of all members   d. None of the above

30. Object being passed to a copy constructor _____

a) Must not be mentioned in parameter list

b) Must be passed with integer type

c) Must be passed by value

d**) Must be passed by reference**

31. Instance of which type of class can't be created?

a) Parent class

b) Abstract class

c) Anonymous class

d) Nested class

32. Which of the following is incorrect?

a) class student {}s;

b) class student {}; student s;

c) class student{}s[];

d) class student {}; student s[5];

33.What is a pure virtual function?

a) A virtual function defined inside the base class

b) A virtual function that has no definition relative to the base class

c) A virtual function that is defined inside the derived class

d) Any function that is made virtual

34. How to create a hyperlink in HTML?

a. Far western University

b.<a url = " www.fwu.edu.np " Far western University /a>

c.Far western University

d.<a>www.fwu.edu.np < Far western University /a>

35.Which JavaScript method is used to write into an alert box?

a.window.alertHTML()   **b.window.alert()**

c.window.alertBox()   \d.window.alertContent()

36. Which is the correct JavaScript statement to print the addition of two numbers 10 and 20 in a paragraph whose id is 'result'?

a.getElementById("result").innerHTML = 10+20;

b. getElementById("result").innerHTML = "10+20";

c.getElementById("#result").innerHTML = 10+20;

d.All of the above

37. which of the following expressions is not equivalent to $\overline{x}$?

a) x NAND x

b) x NOR x

c) x NAND 1

d) x NOR 1

38. The Boolean funcation $x'\,y'+xy + x'y$ is equivalent to

a) $x'+ y'$

b) $x+y$

c) $x+y'$

d) $x'+ y$

39. Assume that the memory is word addressable. The number of memory references for accessing the data in executing the program completely is

a) 10   b)11   c)20   d)21

40.RAID configuration of disks are used to provide

a) fault-tolerance   b) high speed

c) high data density   d) none of these

41. If the initial value of register A is A_0, the value of register B after the program execution will be

a) the number of 0 bits in A_0

b) the number of 1 bits in A_0

c) A_0

d) 8

42. In which of the following case(s) is it possible to obtain different results for call-by-reference and call-by-name parameter passing?

a) Passing an expression as a parameter

b) Passing an array as a parameter

c) Passing a pointer as a parameter

d) Passing an array element as a parameter

43. Faster access to non-local variables is achieved using an array of pointer to activation records called a

a) Stack   b) heap   c) display   d) activation tree

44. Heap allocation is required for language

a) That support recursion   b) that support dynamic data structure

c) That use dynamic scope rules   d) none o f these

45. What is the scope of m declared in the main program?

   a) PARAM, P, Q   b) PARAM,P   c) PARAM, Q   d)P, Q

46. Which scheduling policy is most suitable for a time-shared operating system?

   a) Shortest Job First   b) Round Robin

   c) First come first serve   c) Elevator

47. State an undesirable characteristic of each of the following criteria for measuring performance of an operating system:

   a) Turnaround time   b) Waiting Time

48. System calls are usually invoked by using

   a) a software interrupt   b) polling

   c) an indirect jump   d) a privileged instruction

49. Which of the following does not interrupt a running process?

   a) A device   b) Timer

   c) Scheduler process   d) Power failure

50. Where does the swap space reside?

   a) RAM   b) Disk   c) ROM   d) On-chip cache

51. How many bytes of data can be sent in 15 second over a serial link with baud rate of 9600 in asynchronous mode with odd parity and two stop bits in the frame?

   a) 10,000 bytes   b) 12,000 bytes   c) 15,000 bytes   d) 27,000 bytes

52. In the 4B/5B encoding scheme, every 4 bits of data are encoded in a 5-bit codeword, It is required that the codeword have at most 1 leading and at most 1 trailing zero. How many such codeword's are possible?

   a) 14   b)16   c)18   d) 20

53. In Ehernet when Manchester encoding is used, the bit rate is

   a) Half the baud rate   b) Twice the baud rate

   c) Same as the baud rate   d) none of these

54. In TCP, a unique sequence number assigned to each

a) byte   b) word   c) segment   d) message

55. A subnet has been assigned a subnet mask of 255.255.255.192.What is the maximum number of hosts that can belongs to this subnet?

         a) 14   b) 30   c) 62   d) 126

56. UML stands for

         a) Uniform modeling language   b) Unified modeling language

         c) Unit Modeling Language   d) Universal modeling Language

57. Alpha testing is done by

         a) Customer   b) tester   c) developer   d) All of these

58. Cyclomatic complexity is developed by

         a) BW Doehm   b) TJ Mccabe   c) BW Littlewood   d) Victor Basili

59. Acceptance testing is done by

         a) Developers   b) customers   c) tester   d) None of these

60. The first step of the implementation phase is

         a) Implementation planning

         b) Announce the implementation project

         c) Prepare physical facilities

         d) Select the computer

61. Waterfall model has ....steps or phase.

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

62. Design phase is followed by

         a) Coding   b) dubbing   c) testing   d) maintenance

63. Prototyping is preferred by

         a) Customers   b) developer   c) Both (a) and (b)   d) None of these

64. In the CRT display the monitor using

a) Vacuum glass tube

b) white board

c) Liquid crystal display

d) none of these

65. LCD stands for

a) Light Crystal Display

b) Light Critical Display

c) Local Common Display

d) Liquid Crystal Display

66. The access method used for magnetic tape is

a) Direct

b) random

c) sequential

d) None of these

67. Which of the following topologies is not of broadcast type?

a) Star

b) Bus

c) Ring

d) None of these

68. The execution engine reducing the graph to a normal form which represents the

a) Computed value

b) conventional value

c) Both (a) and (b)

d) None of these

69. In prolog a relation identifier is referred to as a

a) Predicate

b) subject

c) Both (a) and (b)

d) None of these

70................... is the process of finding a unifier for two atoms.

a) Unification

b) Combination

c) Integration

d) None of these

71. Prolog can be used for

a) Intelligent systems

b) Complicated knowledge database

c) Both (a) and (b)

d) None of the above

72. An intelligent robot

a) responds to change in its environment

b) follows instruction mindlessly

c) possesses no more intelligent than a dishwasher

d) All of the above

73. The knowledge base of an AI computing includes both facts and

a) Theories

b) Heuristics

c) Algorithms

d) Analysis

74. Which knowledge includes knowing, what we know vaguely as well as what we know clearly?

a) Accurate

b) Approximate

c) Common Sense

d) Repetitive

75. The ability to gain and apply knowledge and skills is known as

a) Intelligence

b) Experience

c) Both (a) and(b)

d) All of these

76.what is the probability of geeing head when a unbiased coin istossed ?

a) greater than 0.5   b) less than 0.5

c) not equal to 0.5   d) equal to 0.5

77.what is the probability of getting prime number and odd number when fair dice is thrown ?

a) 4/6   b) 3/6   c) 2/6   d) 5/6

78. What is range of multiple correlation coefficients?

a) 0 to 1   b) -1 to 0   c) -1 to +1   d) a and b

79. Which one is not a none parametric test?

a) H-test   b) U-test   c) Run test   d) Z-test

80. Which one the standard deviation of Poisson distribution?

a) λ b) λ^2 c) $\sqrt{\lambda}$ d) $\sqrt[3]{\lambda}$

81. Which partition value is similar to median?

a) P_{75} b) D_5 c) P_{25} d) Q_3

82. The nth derivative of x^n is

           a.   n   b. n!   c. 1   d. 0

83. If $y = e^{ax}$ then y_n is equal to

           a. e^{ax} b. ae^{ax} c. $a^n e^{ax}$ d. none

84. The value of $\int_0^{\pi/2} \frac{sinx\, dx}{sinx+cosx}$ is

           a. $\pi/2$ b. $\pi/4$ d. π d. 1

85. Which of the following sequence is convergent?

           a. $\frac{1}{n}$ b. $\frac{1}{2^n}$ d. $\frac{1}{n^2}$ d. all

86. Which of the following is basis for $\mathbb{R}^2$?

a. {(1,0) , (0,1)}   b. {(1,0) , (0,2)}   c. {(1,0) , (1,1)}   d. all

87. The magnitude of the vector $\vec{u} = 3\vec{i} + 4\vec{j}$ is

a. 25   b. 5   c. 7   d. $\sqrt{5}$

88. The system of linear equations is said to be inconsistent if it has

a. no solution   b. unique solution   c. infinite solution   d. more than one solution

89. The eigen value of the matrix $\begin{bmatrix} 2 & 1 \\ 1 & 4 \end{bmatrix}$ is

a. 1   b. 2   c. 3   d.4

90. The inverse of the matrix $\begin{bmatrix} 5 & 2 \\ 7 & 3 \end{bmatrix}$ is

a. $\begin{bmatrix} 5 & -2 \\ -7 & 3 \end{bmatrix}$ b. $\begin{bmatrix} 3 & -2 \\ -7 & 5 \end{bmatrix}$ c. $\begin{bmatrix} -5 & 2 \\ 7 & -3 \end{bmatrix}$ d. $\begin{bmatrix} -5 & 7 \\ 2 & -3 \end{bmatrix}$

91. The orthogonal projection of v onto u is

a. $\frac{v.u}{u.u}u$ b. $\frac{v.u}{u.u}v$ c. $\frac{v.u}{v.v}u$ d. $\frac{v.u}{v.v}v$

92. Which of the following statements are NOT true of simulation?

  A. Simulation model cannot prescribe what should be done about a problem

  B. Simulation models can be used to study alternative solutions to a problem

  C. Simulation models the behaviour of a system

  D. The equations describing the operating characteristics of the system are known

93. Select the valid reasons for using simulation.

  A. Relationship between the variables is nonlinear

  B. Optimized solutions are obtained

  C. Conduct experiments without disrupting the real system

  D. Answers 1 and 3

94. Monte Carlo simulation gets its name from which of the following?

  A. Data collection

  B.   Model formulation

  C. Random-number assignment

  D. Analysis

95. Simulation models can be used to obtain operating characteristic estimates in less time than with the real system using a feature of simulation called:

  A. Microseconds

  B. Warp speed

  C. Time compression

  D. None of the above

96. What is computer architecture?

  a) set of categories and methods that specify the functioning, organisation, and implementation of computer systems

  b) set of principles and methods that specify the functioning, organisation, and implementation of computer systems

  c) set of functions and methods that specify the functioning, organisation, and implementation of computer systems

  d) None of the mentioned

97. What is computer organization?

  a) structure and behavior of a computer system as observed by the user

  b) structure of a computer system as observed by the developer

  c) structure and behavior of a computer system as observed by the developer

  d) All of the mentioned

98. Which of the following is a type of computer architecture?

  a) Micro architecture

  b) Harvard Architecture

  c) Von-Neumann Architecture

  d) All of the mentioned

99. Which of the following is the subcategories of computer architecture?

  a) Micro architecture

  b) Instruction set architecture

  c) Systems design

  d) All of the mentioned

100. What does CSA stands for?

  a) Computer Service Architecture

  b) Computer Speed Addition

  c) Carry Save Addition

  d) None of the mentioned