1. The Constituent Assembly met for the first time on 9th December in which year ?
   A) 1947   B) 1946   C) 1950   D) 1949

2. 'Objective Resolution' drafted and moved by Pandit Jawaharlal Nehru in the Constituent Assembly on
   A) 13 December, 1946
   C) 26 January, 1950
   B) 30 January, 1946
   D) 3 December, 1950

3. First Delimitation Commission was setup in India on
   A) 1976   B) 1955   C) 1951   D) 1960

4. The Prime Minister's Secretariat was renamed into Prime Minister's Office at the time of
   A) P. V. Narasimha Rao
   C) V. P. Singh
   B) Jawaharlal Nehru
   D) Morarji Desai

5. Who fixes the number of Judges in the Supreme Court ?
   A) The President
   C) The Parliament
   B) The Chief Justice
   D) Vice President

6. Malayalam newspaper 'Paschimodayam' published in 1847 by
   A) Maman Mapilla
   C) Benjamin Bailey
   B) Ramakrishna Pilla
   D) Herman Gundert

7. Kallumala agitation associated with
   A) Dress Code
   C) Political Changes
   B) Educational Reform
   D) Temple Entry

8. Name the work of K. Damodaran.
   A) Ritumati
   C) Adukkalayil ninum Arangathekku
   B) Pattabakhi
   D) Mathilukalkkapuram

9. Who has not participated in Vaikkam Sathyagraha ?
   A) K. Kelappan
   C) A. K. Gopalan
   B) K. P. Kesava Menon
   D) Mannath Padmanabhan

10. Who among the following became the member of 'Malayala Pradesh Congress Committee' ?
    A) Kuttimalu Amma
    C) Captain Lakshmi
    B) Kittur Channamma
    D) Akkama Cherian

11. Father of Indian Unrest
    A) Lala Lajpat Rai
    C) Bipin Chandra Pal
    B) Bhagat Singh
    D) Bal Gangadhar Tilak

12. Mathikettan Shola National Park is situated in which District ?
    A) Wayanad   B) Idukki   C) Palakkad   D) Pathanam Thitta

A

13. Bhakra Nangal Dam is across which river ?
    A) Kaveri   B) Mahanadi   C) Satluj   D) Krishna

14. Current General Manager of South Eastern Railway
    A) A. K. Goel   B) S. Gehlot   C) A. Datta   D) B. K. Jain

15. Which company has launched BBM money transfer service in India ?
    A) Microsoft   B) Sony   C) Apple   D) Black Berry

16. Who among the following is not the Goodwill Ambassador of India in Rio Olympics ?
    A) Sachin Tendulkar   B) Abinav Bindra
    C) Sushil Kumar   D) Salman Khan

17. 2015 Kendra Sahitya Academy Award Winning Book
    A) Agnisakshi   B) Ratrimazha
    C) Marannu Vecha Vasthukkal   D) Aarachaar

18. Which is known as Indian Education Commission ?
    A) Kothari Commission   B) Mudaliar Commission
    C) Radhakrishnan Commission   D) Saikia Committee

19. 'Tamasa' is the dance form of
    A) Gujarat   B) Rajasthan   C) Maharashtra   D) Bihar

20. Which day was celebrated as National Education Day ?
    A) September 10 B) November 11   C) October 2   D) December 20

21. If $\vec{v} = x^2 \hat{i} + y^2 \hat{j} + z^2 \hat{k}$, find div (curl $\vec{v}$).

    A) 0   B) $2(x+y+z)$

    C) $2\left(x\hat{i} + y\hat{j} + z\hat{k}\right)$ D) 1

22. Find the Laplace transform of cosh at

    A) $\dfrac{s}{s^2 + a^2}$ B) $\dfrac{a}{s^2 - a^2}$ C) $\dfrac{s}{s^2 - a^2}$ D) $\dfrac{a}{s^2 + a^2}$

23. Find the rank of $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{bmatrix}$

    A) 2   B) 3   C) 8   D) 0

A   -4-

24. Find the general solution of the differential equation $(D^3 - D^2 - D + 1) y = 0$.
    A) $c_1 e^x + c_2 e^x + c_3 e^{-x}$
    B) $c_1 e^{-x} + c_2 e^{-x} + c_3 e^x$
    C) $(c_1 + c_2 x) e^{-x} + c_3 e^x$
    D) $c_1 e^{-x} + (c_2 + c_3 x) e^x$

25. If C is the unit circle, $\oint_c \dfrac{dz}{z^2 + 4} = ?$
    A) $\dfrac{\pi}{4}$
    B) 0
    C) $\dfrac{\pi}{2}$
    D) $\dfrac{\pi}{6}$

26. Pick up the incorrect statement from the following :
    A) The straight distance between end points of a suspended tape is reduced by an amount called the sag correction.
    B) While measuring a distance with a tape of length 100.005 m, the distance should be increased by 0.005 m for each tape length.
    C) An increase in temperature causes a tape to increase in length and the measured distance is too large.
    D) A 100 m tape of cross section 10 mm × 0.25 mm stretches about 10 mm under 5 kg pull.

27. A stone of mass 1 kg is tied to a string of length 1 m and whirled in a horizontal circle at a constant angular speed 5 rad/sec. The tension in the string is
    A) 30 N
    B) 25 N
    C) 15 N
    D) 10 N

28. The ratio of the moment of inertia of a rectangle about its centroidal axis to that about its base, is
    A) 1/3
    B) 1/4
    C) 3/4
    D) 4

29. Ultimate strength to cement is provided by
    A) Di-calcium silicate
    B) Tri-calcium silicate
    C) Tri-calcium aluminate
    D) Tetra calcium alumino ferrite

30. The portion of the brick without a triangular corner equal to half the width and half the length, is called
    A) Brick bat
    B) Queen closer
    C) Squint brick
    D) King closer

31. An industrial heat pump operates between the temperatures of 27° C and –13° C. The rates of heat addition and heat rejection are 750 W and 1000 W respectively. The COP for the heat pump is
    A) 7.5
    B) 6.5
    C) 4.0
    D) 3.0

32. A hydraulic turbine develops 1000 kW power for a head of 40 m. If the head is reduced to 20 m, the power developed (in kW) is
    A) 177
    B) 354
    C) 500
    D) 800

A

33. Two mating spur gears have 40 and 120 teeth respectively. The pinion rotates at 1200 rpm and transmits a torque of 20 Nm. The torque transmitted by gear is
    A) 80 Nm
    B) 30 Nm
    C) 40 Nm
    D) 60 Nm

34. Misrun is a casting defect which occurs due to
    A) Very high pouring temperature of the molten metal
    B) Insufficient fluidity of the molten metal
    C) Absorption of gases by the liquid metal
    D) Improper alignment of the mould flasks

35. Which of the following arc welding process does not use consumable electrode ?
    A) GTAW
    B) GMAW
    C) SAW
    D) None of these

36. A 500 kVA transformer has full load efficiency of 95% at UPF. It gives the same efficiency at 60% of full load and at UPF. The iron loss of the transformer is
    A) 10.35 kW
    B) 9.87 kW
    C) 9.08 kW
    D) 10.71 kW

37. Leakage flux in an induction motor is the flux that
    A) Links stator and rotor windings
    B) Leaks through the machine
    C) Links stator winding or the rotor winding but not both
    D) Links none of the windings

38. It is desired to have a constant direct current through an ideal inductor, the nature of the voltage source must be
    A) Constant voltage
    B) Linearly increasing voltage
    C) Exponentially increasing voltage
    D) An ideal impulse

39. A filament bulb rated at 500 W, 100 V is to be connected in series with capacitance across 220 V, 50 Hz supply. What will be the value of the capacitor such that the voltage across the bulb and the power consumed by the bulb are according to the rating of the bulb ?
    A) 78 μF
    B) 81 μF
    C) 90 μF
    D) 86 μF

40. In delta to star transformation, if the three elements of the delta connection are scaled by a factor 'm', m > 0, the elements of the corresponding star equivalent will be scaled by a factor of
    A) m^2
    B) $\sqrt{m}$
    C) $\frac{1}{m}$
    D) m

A

41. In an OPAMP out offset voltage due to input offset current is given by

A) $V_o = I_{Io} R_i$

B) $V_o = I_{Io} \dfrac{R_f}{R_i + R_f}$

C) $V_o = I_{Io} R_f$

D) $V_o = -I_{Io} R_i$

42. For a PN diode, maximum reverse bias potential that can be applied before entering a zener region is called

A) Break down voltage

B) Peak inverse voltage

C) Reverse bias voltage

D) None of the above

43. In a fullwave rectifier the DC voltage is given by

A) $V_{dc} = 0.318 \, V_m$

B) $V_{dc} = 0.836$

C) $V_{dc} = 0.218 \, V_m$

D) $V_{dc} = 0.636 \, V_m$

44. Frequency of oscillation for an RC phase shift oscillator is given by

A) $f = \dfrac{1}{2\pi RC \sqrt{6 + \dfrac{4R_c}{R}}}$

B) $f = \dfrac{1}{2\pi RC}$

C) $f = \dfrac{1}{2\pi RC \sqrt{4 + \dfrac{6R_c}{R}}}$

D) $f = \dfrac{1}{2\pi \sqrt{RC}}$

45. If delay line is not used in vertical section of a CRO

A) Initial Part is lost

B) Final Part is lost

C) No signal in the display

D) Always shows a horizontal line

46. What will be the output of the following program ?
```
void main()
{
int i=1;
printf("%d", i=++i==1);
}
```
A) 0

B) 1

C) 2

D) error

A

47. What will be the value of 'f' after the execution of the following program ?

```
void main()
{
char a;
float f = 10;
for(a=1; a<=5;a++)
{f-=.2;}
printf("\nf=%g",f);
}
```

A) 5.0 B) 9 C) 9.0 D) error

48. What will be the output of the following program ?

```
#define abc(x,y) x*y
void main()
{
int a=1, b=2;
printf("%d",abc(a+1,b-2));
}
```

A) 0 B) 1 C) 2 D) 3

49. Which statement is added to the following program such that address of "r1" gets stored in "r2" ?

```
void main()
{
int*r2;
void abc(int **);
abc(&r2);
printf("%d", *r2);
}
void abc(int **r3)
{
int r1=5;
/*add statement here*/
}
```

A) *r2 = &r1 B) *r1 = &r3 C) *r3 = &r1 D) none of the above

50. The CPU can also be called as
    A) Processor hub   B) ISP
    C) Node   D) All the above

A   -8-

51. Numbers are represented in a computer in 2's complement because
    A) It requires less storage
    B) There is a unique representation for zero
    C) It produces less error when compared to other representations
    D) None of the above

52. Which of the following is equivalent to the expression $(\overline{A+B}) \cdot (\overline{A} \cdot \overline{B}) \cdot (A+B)$?

    A) F   B) T   C) $\overline{A+B}$ D) $\overline{A} \cdot \overline{B}$

53. Which of the following is an example of a combinational logic circuit ?
    A) MUX   B) Adder   C) Counter   D) Decoder

54. Which of the following is an example of a synchronous interrupt ?
    A) Keyboard interrupt   B) Pushing the reset button
    C) Divide by zero   D) None of the above

55. Which of the following is true ?
    A) Every instruction will have atleast one machine cycle
    B) The opcode of an instruction can never be one byte long
    C) Every instruction has opcode fetch and memory read operation
    D) None of the above

56. Matrix manipulation and sorting can be easily performed by which of the type of computer ?
    A) SISD   B) MIMD   C) MISD   D) SIMD

57. Operand forwarding helps to overcome
    A) Branch hazards   B) Data hazards   C) Both A) and B)   D) None of the above

58. Which of the flags will be affected by the instruction INC AL, if AL = FFH ?
    A) Zero, Carry   B) Zero, Auxiliary Carry, Carry, Overflow
    C) Zero only   D) Carry only

59. Which of the following methods is best suited for transferring 250 MB of data from hard disk to memory ?
    A) Polling   B) DMA
    C) Interrupt   D) None of the above

60. Which of the following is not true for a microcontroller ?
    A) Microcontrollers have special instructions for bit manipulation
    B) They are commonly used in embedded systems
    C) Microcontrollers with Harvard architecture are available
    D) Microcontrollers cannot run without external memory

A

72. Which of the following is likely to be the most expensive cost of quality in Software Engineering ?
    A) External Failure Cost
    B) Appraisal Cost
    C) Internal Failure Cost
    D) Prevention Cost

73. Which is the correct preorder traversal of the following binary tree ?
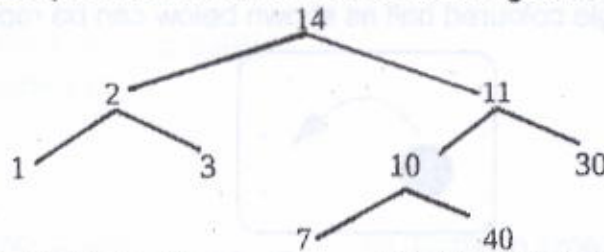
    A) 14, 2, 1, 3, 11, 10, 7, 30, 40
    B) 14, 2, 3, 1, 11, 10, 30, 7, 40
    C) 1, 2, 3, 7, 10, 11, 14, 30, 40
    D) 40, 30, 14, 11, 10, 7, 3, 2, 1

74. Suppose we're debugging a quicksort implementation that is supposed to sort an array in ascending order. After the first partition step has been completed, the contents of the array are in the following order :

    3 9 1 18 19 24 22 20

    Which of the following statements is correct about the partition step ?
    A) The pivot could have been 18, but could not have been 19
    B) The pivot could have been 19, but could not have been 18
    C) The pivot could have been either 18 or 19
    D) Neither 18 nor 19 could have been the pivot

75. Suppose you were implementing a data structure to store information about the paintings on display at an art dealer's showroom. Of the following data structures, which one is the right one to use ?
    A) Unordered array
    B) Sorted array
    C) Binary search tree
    D) It depends

76. What is the running time of the following code fragment ?
    for(int i = 0; i < 10; i++)
    for(int j = 0; j < N; j++)
    for(int k = N−2; k < N+2; k++)
    cout << i << " " << j << endl;
    A) O (log N)   B) O (N)   C) O (N log N)   D) O (N²)

77. Breadth first search
    A) Scans each incident node along with its children
    B) Scans all incident edges before moving to other node
    C) Is same as back tracking
    D) Scans all the nodes in random order

A

78. The Knapsack problem where the objective function is to minimize the profit is
    A) Greedy
    B) Dynamic
    C) Back tracking
    D) Branch and Bound

79. Choose the correct answer for the following statements :
    I. NP problem can run in polynomial time on a non-deterministic turing machine.
    II. All NP complete problem are NP-Hard.
    A) I is false and II is true
    B) I is true and II is false
    C) Both are false
    D) Both are true

80. A Hamiltonian cycle in a Hamiltonian graph of order 24 has
    A) 12 edges
    B) 23 edges
    C) 24 edges
    D) None of the above

81. Which of the following is not a group ?
    A) The integers under addition
    B) The non-zero integers under multiplication
    C) The non-zero real numbers under multiplication
    D) The complex numbers under addition

82. The binary relation $R = \{(0, 0), (1, 1)\}$ on $A = \{0, 1, 2, 3\}$ is
    A) Reflexive, Not Symmetric, Transitive
    B) Not Reflexive, Symmetric, Transitive
    C) Reflexive, Symmetric, Not Transitive
    D) Reflexive, Not Symmetric, Not Transitive

83. Let $R = \{(a, a), (a, b), (b, b), (a, c), (c, c)\}$ be a partial order relation on $\Sigma = \{a, b, c\}$. Let '<=' be the corresponding lexicographic order on Σ *. Which of the following is true ?
    A) bc <= ba
    B) abbac <= abb
    C) abbac <= abbab
    D) abbaaacc <= abbaab

84. What is the language of the grammar with the following production rules ?
    S → ASb | c
    A → a
    A) $\{a^n cb^n \mid n \in N\}$
    B) $\{xcb \mid x \in \{a\} * \}$
    C) $\{acy \mid y \in \{b\} * \}$
    D) All of the answers above are incorrect

85. Which of the following is not decidable ?
    A) Given a turing machine M, a string S and an integer k, M accepts S within k steps
    B) Equivalence of two given turing machines
    C) Language accepted by a given finite state machine is not empty
    D) Language generated by a context free grammar is not empty

86. Choose the correct statement.
    A) The recursively enumerable sets are closed under complementation
    B) Deterministic context free languages are closed under intersection
    C) Context sensitive languages are closed under homomorphism
    D) A is recursive if both A and its complement are accepted by turing machines

87. Which of the following statements is the most correct answer ?
    A) A language is ambiguous if every sentence has two or more parse trees
    B) A context-free grammar is ambiguous if the right-hand side of one of its production rules starts with the non-terminal that appears on the left-hand side
    C) A language is unambiguous if every sentence has a unique left-most derivation
    D) All three statements above are valid

88. What is a sentential form ?
    A) One line of a derivation
    B) An arbitrary string of grammar symbols
    C) The content of the LL(1) parse stack
    D) The string of symbols between the current point in the parse and the root of the parse tree

89. Which of the following is not used for synchronization ?
    A) The Banker's algorithm
    B) The Bakery algorithm
    C) Busy waiting with test and set
    D) Monitors

90. The problem of internal fragmentation can be lessened in systems employing a fixed partition memory management scheme by using
    A) Random size partitions
    B) Equal size partitions
    C) Unequal size partitions
    D) None of the above

91. The purpose of a TLB is
    A) To cache page translation information
    B) To cache frequently used data
    C) To hold register values while a process is waiting to run
    D) To hold page table start and end

92. Which of the following is not a web server ?
    A) Internet Information Server
    B) NetBeans
    C) Apache
    D) None of the above

93. Supply chain management refers to the coordination of all supply activities of an organisation from its suppliers and delivery of products to its customers. E-commerce transactions between a company and its stakeholders, be their consumers or businesses are often referred to as
A) C2C, C2B
B) B2B, C2B
C) B2C, B2B
D) B2C, C2C

94. Which of the following is not used for inter process communication ?
A) Message queue
B) Semaphore
C) Pipes
D) None of the above

95. A distributed file system exhibits location transparency if
A) The name of a file indicates exactly where the file can be found
B) The name of a file does not indicate where the file can be found
C) The name of a file does not need to be changed when the location of the file changes
D) The name of a file is not adequate for finding the file

96. The input and output ports of a router perform the _____ layer functions of the router.
A) Physical and data link layer
B) Network
C) Transport
D) None of the above

97. In distance vector routing, each node periodically shares its routing table with _____ whenever there is a change.
A) Every other node
B) One neighbour
C) Its immediate neighbours
D) None of the above

98. Which of the following is not an ICMP command ?
A) Ping
B) Traceroute
C) Ifconfig
D) None of the above

99. Which of the following is an application layer protocol ?
A) TCP
B) Ethernet
C) Bluetooth
D) HTTP

100. The _____ cipher reorders the plain text characters to create a cipher text.
A) Substitution
B) Transposition
C) Either A) or B)
D) Neither A) nor B)

Space for Rough Work