1. _____ algorithm is an example of a greedy algorithm, as it makes the locally optimal choice at each stage with the hope of finding the global optimum.

(A) Kruskal's
(B) Dijkstra's
(C) Fulkerson's
(D) Warshell's
(E) Answer not known

2. _____ is a list of graph nodes with each node itself consisting of a linked list of its neighboring nodes.

(A) Path list
(B) Adjacency list
(C) Matrix list
(D) Directed list
(E) Answer not known

3. _____ is a connected graph with no cycles.

(A) Tree
(B) Loop
(C) path
(D) Degree
(E) Answer not known

4. In a directed graph, _____ of a vertex is the number of edges beginning at the vertex.

(A) Degree

(B) In degree

(C) Out degree

(D) Path

(E) Answer not known

5. The memory use of an adjacency matrix is _____, where n is the number of nodes in the graph

(A) $O(n+1)$

(B) $O(n)$

(C) $O(n^2)$

(D) $O(n-1)$

(E) Answer not known

6. Select the linked list for connecting real of the list is to its front

(i) Singly linked list

(ii) Doubly linked list

(iii) Circular linked list

(iv) Queue

(A) (iii)

(B) (i) and (ii)

(C) (iv) and (i)

(D) (i)

(E) Answer not known

7. Post fix expressions are efficiently evaluated using

(A) Queue

(B) Tree

(C) Array

(D) Stack

(E) Answer not known

8. Inserting a node at the beginning of the circular doubly linked list needs to modify _____ pointers

(A) 3

(B) 1

(C) 2

(D) Null

(E) Answer not known

9. _____ condition indicates that the stack is empty

(A) Top = Max
(B) Top = Max – 1
(C) Top = Null
(D) Top = Max + 1
(E) Answer not known

10. Typical time requirement for operations on queue is

(A) $O(n)$
(B) $O(n \log n)$
(C) $O(\log n)$
(D) $O(1)$
(E) Answer not known

11. _____ is an example for a postfix expression.

(A) $+ab*c$
(B) $a+b*c$
(C) $abc*+$
(D) $ab+d*c$
(E) Answer not known

12. In which of the following data structures, both insertion and deletion operations can take place at either end of them?

(A) Priority queue
(B) Stack
(C) Queue
(D) Deque
(E) Answer not known

13. _____ is also called as bucket sort

(A) Quick sort
(B) Shell sort
(C) Merge sort
(D) Radix sort
(E) Answer not known

14. What is the pre requisite for using binary search on an array?

(A) Array must be unsorted
(B) Array must have even number of elements
(C) Array must have odd number of elements
(D) Array must be sorted
(E) Answer not known

15. Which of the following is a common technique to handle collisions while hashing?

(A) Binary search
(B) Divide and conquer
(C) Merge and sort
(D) Linear probing
(E) Answer not known

16. Match the concept with its purpose in quick sort.

	Concept		Purpose
(a)	Divide	1.	Recursively sort the sub arrays
(b)	Conquer	2.	Choose a pivot and partition the array
(c)	In-place	3.	Does not use extra space for sorting
(d)	Recursive	4.	Function that calls itself

	(a)	(b)	(c)	(d)
(A)	2	1	3	4
(B)	1	2	3	4
(C)	1	3	2	4
(D)	1	4	2	3

(E) Answer not known

17. In a hash table, an element with key k is stored at index

(A) k (B) $\log k$

(C) $h(k)$ (D) k^2

(E) Answer not known

18. What is the worst case time complexity of insertion sort for an array size of n?

(A) $O(n)$ (B) $O(n \log n)$

(C) $O(n^2)$ (D) $O(\log n)$

(E) Answer not known

19. In _____ traversal, all the nodes at a level in a binary tree are accessed before going to the next level.

(A) Breadth first
(B) Depth first
(C) Post order
(D) In order
(E) Answer not known

20. The nodes which share the same parent are called

(A) successors
(B) descendants
(C) siblings
(D) ancestors
(E) Answer not known

21. Find the clock cycle timed for a system that uses a 500 KHz clock

(A) 5 μS
(B) 2 μS
(C) 2 mS
(D) 5 mS
(E) Answer not known

22. Choose the common uses of Flip-Flops from the following :

(i) Bounce elimination switch

(ii) Latch

(iii) Registers

(iv) Counters

(v) Memory

(A) (i), (ii), (iii), (iv), (v)
(B) (i), (ii), (iii), (iv)
(C) (ii), (iii), (iv), (v)
(D) (ii), (iii), (iv)
(E) Answer not known

23. For an n-stage binary ripple counter, the worst-case settling time is _____, when t_{pd} is the propagation delay time associated with each flip-flop.

(A) $n + t_{pd}$ (B) n / t_{pd}

(C) $n - t_{pd}$ (D) $n \times t_{pd}$

(E) Answer not known

24. How many decoding inputs are there in a 64×4 ROM?

(A) 6 (B) 7

(C) 8 (D) 9

(E) Answer not known

25. Simplify the Boolean function

$$F(x, y, z) = \sum(0, 2, 4, 5, 6)$$

(A) $F = y'z' + yz' + xy'$

(B) $F = z' + xy'$

(C) $F = x'z' + xz' + xy'$

(D) $F = x'y'z' + x'yz' + xy'z' + xy'z + xyz'$

(E) Answer not known

26. Boolean functions expressed as a sum of minterms or product of maxterms are said to be in _____ form.

(A) standard (B) non-standard

(C) canonical (D) non-canonical

(E) Answer not known

27. How many 3×8 decoders are required to construct a 4×16 decoder?

(A) 2 (B) 3

(C) 4 (D) 5

(E) Answer not known

28. If the register can shift in both directions and has parallel-load capabilities, it is referred to as a

(A) Unidirectional shift register
(B) Bidirectional shift register
(C) Universal shift register
(D) Shift right and shift left register
(E) Answer not known

29. Identify the read only memory among the following :

(i) ROM
(ii) PROM
(iii) EPROM
(iv) EEPROM
(v) EHPROM

(A) (i), (ii) and (iii) only
(B) (ii), (iii) and (iv) only
(C) (iii), (iv) and (v) only
(D) (i), (ii), (iii) and (iv) only
(E) Answer not known

30. Write the expression for BCD ($B_3\ B_2\ B_1\ B_0$) to Gray Code ($G_3\ G_2\ G_1\ G_0$) converter

(A) $G_0 = B_1 \oplus B_0,\ G_1 = B_2 \oplus B_1,\ G_2 = B_2 + B_3\ \ G_3 = B_3$

(B) $G_0 = B_1 + B_0,\ G_1 = B_2 + B_1,\ G_2 = B_2 \oplus B_3\ \ G_3 = B_2$

(C) $G_0 = B_1 \oplus B_0,\ G_1 = B_2 + B_1,\ G_2 = B_2 \oplus B_3\ \ G_3 = B_1$

(D) $G_0 = B_1 + B_0,\ G_1 = B_2 \oplus B_1,\ G_2 = B_2 + B_3\ \ G_3 = B_0$

(E) Answer not known

31. The input resistance (R_i) and output resistance (R_o) of an ideal op-amp should be

(A) infinite and infinite
(B) zero and zero
(C) zero and infinite
(D) infinite and zero
(E) Answer not known

32. The differential mode gain (A_{DM}) and common mode gain (A_{CM}) of an operational amplifier with $A_1(A_2)$ be the voltage amplification from input 1(2) to the output are computed as

(A) $A_{DM} = \frac{1}{2}(A_1 - A_2)$ and $A_{CM} = A_1 + A_2$

(B) $A_{DM} = \frac{1}{2}(A_1 + A_2)$ and $A_{CM} = A_1 - A_2$

(C) $A_{DM} = (A_1 + A_2)$ and $A_{CM} = \frac{1}{2}(A_1 - A_2)$

(D) $A_{DM} = (A_1 - A_2)$ and $A_{CM} = \frac{1}{2}(A_1 + A_2)$

(E) Answer not known

33. The damping coefficient (α) for low pass active RC filter is related to closed loop gain A_0 by

(A) $\alpha = (3 - A_0)$

(B) $\alpha = (3 + A_0)$

(C) $\alpha = \frac{3}{A_0}$

(D) $\alpha = \frac{A_0}{3}$

(E) Answer not known

34. In a voltage controlled oscillator, if input signal frequency $(f_s) = 20\,\text{kHz}$, free running frequency $f_0 = 21\,\text{kHz/v}$, voltage to frequency conversion factor k_v is 4 kHz/v. Find the change in the dc control voltage v_c during lock.

(A) 0.25 V
(B) 1 V
(C) 4 V
(D) 0.5 V
(E) Answer not known

35. When the emitter resistance R_E doubles, the ac emitter resistance

(A) Increases
(B) Decreases
(C) Remains the same
(D) Cannot be determined
(E) Answer not known

36. An audio amplifier is an amplifier that operates in the range of

(A) 20 Hz to 20 MHz
(B) 20 Hz to 20 kHz
(C) 20 Hz to 200 Hz
(D) 200 kHz
(E) Answer not known

37. With class A amplifier, the output signal should be

(A) unclipped
(B) clipped on positive voltage peak
(C) clipped on negative voltage peak
(D) clipped on negative current peak
(E) Answer not known

38. The differential amplifier has two input voltages (v_1 and v_2) and two collector voltages (v_{c_1} and v_{c_2}). The ac output voltage v_{out} is

(A) $v_{out} = v_1 - v_2$

(B) $v_{out} = v_{c_1} - v_{c_2}$

(C) $v_{out} = v_1 + v_2$

(D) $v_{out} = v_{c_1} + v_{c_2}$

(E) Answer not known

39. When a zener diode is in parallel with a load resistor, the current through the current limiting resistor equals the

(A) zener current – load current

(B) load current – zener current

(C) zener current * load current

(D) zener current + load current

(E) Answer not known

40. Voltage divider bias normally operates in the

(A) active region

(B) cutoff region

(C) saturation region

(D) breakdown region

(E) Answer not known

41. Which file mode would you use to open a file for appending (adding to the end)?

(A) ios : : in
(B) ios : : out
(C) ios : : app
(D) ios : : binary
(E) Answer not known

42. The parameter _____ can be used only with the files capable of output.

(A) ios : : app
(B) ios : : in
(C) ios : : ate
(D) ios : : out
(E) Answer not known

43. The default visibility-mode in inheritance is

(A) private
(B) public
(C) friend
(D) virtual
(E) Answer not known

44. A _____ member of a class cannot be inherited either in public mode or in private mode.

(A) private
(B) public
(C) protected
(D) friend
(E) Answer not known

45. The data-type is followed by an _____ symbol, which distinguishes a pointer variable from other variables to the compiler.

(A) *
(B) : :
(C) &
(D) .
(E) Answer not known

46. A _____ is a special member function whose task is to initialize the objects of its class.

(A) virtual function
(B) inline function
(C) constructor
(D) destructor
(E) Answer not known

47. The lifetime of an _____ variable is same as the lifetime of a program.

(A) External
(B) Automatic
(C) Local
(D) Register
(E) Answer not known

48. _____ involves specifying the name of the object, the name of the function and the information to be sent.

(A) Constructors
(B) Member functions
(C) Message passing
(D) Storage classes
(E) Answer not known

49. Find the output :

```
>>> L = ['abc', [(1, 2), ([3], 4)], 5]
>>> L [1] [1] [0] # output
>>> L [1] [1] [0] [0] # output
```

(A) ([3], 4)
(B) ([3], 3)
(C) ([1, 2], [3])
(D) ([1, 2], [3], 4)
(E) Answer not known

50. Which statement is wrong in python?

(i) A dictionary is a mutable object but keys are immutable objects.

(ii) A dictionary have duplicate keys.

(iii) Nested dictionaries are dictionaries. That are stored as values within another dictionary.

(iv) Items can be removed using del or pop method.

(A) (ii)
(B) (iii)
(C) (ii) and (iii)
(D) (ii) and (iv)
(E) Answer not known

51. Which module in python allows us to store almost any python object in a file directly?

(A) re
(B) pickle
(C) pandas
(D) shelve
(E) Answer not known

52. Write the output of "L" in the given python code.

```
>>> L = [1, 2, 1, 3, 2, 4, 5]
>>> L = list (set (L))
>> L
```

(A) [1, 2, 3, 4, 5]
(B) [1, 2, 1, 3, 2, 4, 5]
(C) [1, 2]
(D) [{1}, {2}, {3}, {4}, {5}]
(E) Answer not known

53. _____ is one of the file operation that sets the position to a desired point in the file.

(A) putw( )
(B) fseek( )
(C) rewind( )
(D) getw( )
(E) Answer not known

54. The process of assigning the address of a variable to a pointer variable is known as

(A) Initialization
(B) Target values
(C) Memory location
(D) Addresses
(E) Answer not known

55. _____ is a user-defined data type that allows different data types to be combined together to represent a data record.

(A) Structure
(B) Array
(C) Union
(D) Bit field
(E) Answer not known

56. Binary file is a collection of

(A) Bits
(B) Bytes
(C) ASCII
(D) Character
(E) Answer not known

57. The _____ function works almost like a string-assignment operator.

(A) Strcpy
(B) Strcmp
(C) Strcat
(D) Strlen
(E) Answer not known

58. Considering the size of char (character) variables as one byte, what will be the size of the array declared below?

Char array [ ] = “programming language”;

(A) 11 Bytes
(B) 21 Bytes
(C) 8 Bytes
(D) 20 Bytes
(E) Answer not known

59. What will be the value of y if $x = 8$? $y = (x > 6 ? 4 : 6)$;

(A) 0
(B) Compilation Error
(C) 4
(D) 6
(E) Answer not known

60. Match the following :

	Function		Action
(a)	Strcat ( )	1.	Copies one string over another
(b)	Strcmp ( )	2.	Finds the length of a string
(c)	Strcpy ( )	3.	Compares two strings
(d)	Strcen ( )	4.	concatenates two strings

	(a)	(b)	(c)	(d)
(A)	(4)	(3)	(1)	(2)
(B)	(2)	(4)	(3)	(1)
(C)	(3)	(4)	(1)	(2)
(D)	(4)	(3)	(2)	(1)

(E) Answer not known

61. The estimation technique in which samples of the quantizer output and the prediction error are used to derive estimates of the predictor co-efficients is called

(A) Adaptive prediction

(B) Prediction

(C) Adaptive prediction with backward estimation

(D) Adaptive prediction with forward estimation

(E) Answer not known

62. Assume the use of sinusoidal modulation $x(t) = a_0 \cos[2\pi f_0 t]$, the condition to avoid slope overload distortion in Delta modulation for a step size of 'δ' and sampling period T_s is

(A) $\left(\frac{\delta}{Ts}\right) \leq (2\pi f_0 a_0)$

(B) $\left(\frac{\delta}{Ts}\right) \leq \frac{1}{2\pi f_0 a_0}$

(C) $\left(\frac{\delta}{Ts}\right) \geq \frac{1}{2\pi f_0 a_0}$

(D) $\left(\frac{\delta}{Ts}\right) \geq (2\pi f_0 a_0)$

(E) Answer not known

63. An AM news broadcasting station uses a carrier signal of 1 MHz. If the speech signal has frequency components upto 8 kHz, then what is the lowest frequency, highest frequency present in the AM signal. Also what is the bandwidth of the AM signal?

(A) 0.992 MHz, 1.008 MHz, 16 kHz

(B) 992 MHz, 1008 MHz, 8 kHz

(C) 992 MHz, 1008 MHz, 16 kHz

(D) 99.2 MHz, 100.8 MHz, 16 kHz

(E) Answer not known

64. The modulation index in phase modulation is proportional to

(A) Modulating voltage only

(B) Modulation frequency only

(C) Modulating voltage and modulation frequency

(D) Independent of modulating voltage and modulation frequency

(E) Answer not known

65. The capacity of a channel of Bandwidth 'B' hertz, perturbed by additive white Gaussian noise of power spectral density $N_0/2$ and limited in Bandwidth to 'B' with an average transmitted power P is given by,

(A) $C = B\log_2\left[1+\frac{P}{N_0}\right]$ bits/sec

(B) $C = B\log_2\left[1+\frac{P}{N_0 B}\right]$ bits/sec

(C) $C = \log_2\left[1+\frac{P}{N_0 B}\right]$ bits/sec

(D) $C = B\log_2\left[1+\frac{N_0 B}{P}\right]$ bits/sec

(E) Answer not known

66. The average probability of symbol error for coherent binary PSK equals,

(A) $P_e = \frac{1}{2}\text{erfc}\left[\sqrt{\frac{2E_b}{N_0}}\right]$

(B) $P_e = \frac{1}{2}\text{erfc}\left[\sqrt{\frac{E_b}{2N_0}}\right]$

(C) $P_e = \frac{1}{2}\text{erfc}\left[\sqrt{\frac{4E_b}{N_0}}\right]$

(D) $P_e = \frac{1}{2}\text{erfc}\left[\sqrt{\frac{E_b}{N_0}}\right]$

(E) Answer not known

67. Nyquist criterion for distortionless baseband transmission in the absence of noise is given by,

(A) $\sum_{n=-\infty}^{\infty} P(f) = 0$

(B) $\sum_{n=-\infty}^{\infty} P(f - nR_b) = 0$

(C) $\sum_{n=-\infty}^{\infty} P(f - nR_b) = T_b$

(D) $\sum_{n=-\infty}^{\infty} P(f - nR_b) = 1$

(E) Answer not known

68. Match the following :

(a)	Convolutional codes decoder	1.	Hamming codes
(b)	Burst and random error correction	2.	Cyclic codes
(c)	Subclass of linear block codes	3.	Viterbis algorithm
(d)	Binary, single error correcting, perfect codes	4.	Interlaced codes

	(a)	(b)	(c)	(d)
(A)	(3)	(4)	(2)	(1)
(B)	(1)	(4)	(2)	(3)
(C)	(3)	(2)	(4)	(1)
(D)	(4)	(2)	(1)	(3)

(E) Answer not known

69. If I_{dc} is the direct current in amperes, q_e the magnitude of electron charge and B_n is the equivalent noise bandwidth in hertz, the mean square shot noise current is given by,

(A) $I_n^2 = 2q_eB_n$ amperes^2 (B) $I_n^2 = 2I_{dc}q_eB_n$ amperes^2

(C) $I_n^2 = 2I_{dc}^2q_eB_n$ amperes^2 (D) $I_n^2 = 2q_eI_{dc}$ amperes^2

(E) Answer not known

70. The code efficiency of a (5, 2) linear block code is,

(A) 0.33 (B) 0.25

(C) 0.4 (D) 0.57

(E) Answer not known

71. Algorithms in which the decomposition is based on decomposing the sequence $x(n)$, into successively smaller subsequences are called as

(A) DIF-FFT (B) DFT

(C) DIT-FFT (D) ZT

(E) Answer not known

72. $X(Z) = \dfrac{1 - z^{-1}\cos w_0}{1 - zz^{-1}\cos w_0 + z^{-2}}$ is the z-transform of

(A) $a^n u(n)$ (B) $(\sin w_0 n)u(n)$

(C) $(\cos w_0 n)u(n)$ (D) $n \cdot a^n u(n)$

(E) Answer not known

73. The filters that exhibit equiripple behaviour in both pass band and stop band are

(A) Cauer filters
(B) (A) and (D) both
(C) Butter worth filters
(D) Elliptic filters
(E) Answer not known

74. The signals that are defined for every value of time 't' and they take on values in the continuous interval (a,b) , where 'a' can be $-\infty$ and 'b' can be ∞

(A) Digital signals
(B) Analog signals
(C) Continuous time signals
(D) Both (B) and (C)
(E) Answer not known

75. Match the following sequences with the corresponding Discrete-Time Fourier transform

(a)	$\delta(n)$	1.	$2\pi\delta(w)$
(b)	$\delta(n-n_0)$	2.	$2\pi\delta(w-w_0)$
(c)	$e^{jn\omega_0}$	3.	$e^{-jn_0\omega}$
(d)	1	4.	1

	(a)	(b)	(c)	(d)
(A)	4	3	2	1
(B)	1	2	3	4
(C)	4	1	3	2
(D)	3	2	4	1

(E) Answer not known

76. Determine the Z-transform of $X(n) = n \cdot \alpha^n u(-n)$

(A) $X(z) = \dfrac{z}{1-\alpha^{-1} z}$

(B) $X(z) = -\dfrac{\alpha^{-1} z}{\left(1-\alpha^{-1} z\right)^2}$

(C) $X(z) = \dfrac{z}{1+\alpha^{-1} z}$

(D) $X(z) = \dfrac{\alpha^{-1}}{1-\alpha^{-1} z}$

(E) Answer not known

77. The impulse response of a linear time-invariant system is $h(n) = \{1, \underset{\uparrow}{2}, 1, -1\}$. Determine the response of the system to the *i/p* signal $x(n) = \{\underset{\uparrow}{1}, 2, 3, 1\}$

(A) $y(n) = \{...., 0, 0, 1, \underset{\uparrow}{8}, 5, 0, 0, ...\}$

(B) $y(n) = \{....., 0, 0, \underset{\uparrow}{1}, 5, 0, 0, ...\}$

(C) $y(n) = \{..., 0, 0, 1, \underset{\uparrow}{4}, 8, 8, 3, -2, -1, 0, 0\}$

(D) $y(n) = \{...., 0, 0, \underset{\uparrow}{8}, 8, 3, 0, 0, ...\}$

(E) Answer not known

78. The ideal Hilbert transformer is also called as

(A) 45° phase shifter
(B) 90° phase inverter
(C) 90° phase shifter
(D) 45° phase shifter
(E) Answer not known

79. Identify the IIR filter design methods

(i) Approximation of derivatives
(ii) Impulse invariance
(iii) Bilinear transformation

(A) (i) and (ii)
(B) (ii) and (iii)
(C) (i) and (iii)
(D) (i),(ii) and (iii)
(E) Answer not known

80. During the quantization, the round off error is symmetric about zero and falls in the range

(A) $\frac{-1}{2}(2^{-b} - 2^{-b_u}) \le Er \le \frac{1}{2}(2^{-b} - 2^{-b_u})$

(B) $-\frac{1}{2}(2^{-b} - 2^{-b_u}) \le Er \le 0$

(C) $0 \le Er \le \frac{1}{2}\left(2^{-b} - 2^{-bu}\right)$

(D) $0 \le Er \le \frac{1}{2}\left(2^{-b} + 2^{-bu}\right)$

(E) Answer not known

81. Consider the following statements

(1) SMPS generates both the electro magnetic and radio interference due to high switching frequency

(2) SMPS has high ripple in output voltage and its regulation in poor

(3) The output voltage of SMPS is less sensitive with respect to input voltage variation

Which of the above statements are correct?

(A) (1) and (3) only
(B) (2) and (3) only
(C) (1) and (2) only
(D) (1), (2) and (3)
(E) Answer not known

82. A single phase full bridge inverter can operate in load commutation mode if load consists of

(A) RL
(B) RLC under damped
(C) RLC over damped
(D) RLC critically damped
(E) Answer not known

83. A chopper circuit is operating on TRC control mode at a frequency of 2 kHz on a 230V dc supply. For output voltage of 170 V, the conduction and blocking periods of a thyristor in each cycle are respectively

(A) 0.386 ms and 0.114 ms
(B) 0.369 ms and 0.131 ms
(C) 0.390 ms and 0.110 ms
(D) 0.131 ms and 0.369 ms
(E) Answer not known

84. A three phase diode bridge rectifier is fed from a 400V rms, 50 Hz, three phase ac source. If the load is purely resistive, the peak instantaneous output voltage is equal to

(A) 400 V
(B) $400\sqrt{2}V$
(C) $400\sqrt{\frac{2}{3}V}$
(D) $\frac{400}{\sqrt{3}}V$
(E) Answer not known

85. Stand alone data acquisition systems are called

(A) data logger
(B) data B logger
(C) data V logger
(D) Digital B logger
(E) Answer not known

86. In a currents transformer

(A) number of turns of primary winding is loss than the number of turns of secondary winding

(B) number of turns of primary winding is greater than the number of turns of secondary winding

(C) number of turns of primary winding is equal to the number of turns of secondary winding

(D) there is no secondary winding

(E) Answer not known

87. Two Wattmeter method of measurement of power is used to measure three phase power in a

(A) three phase, 3 wire balanced load only

(B) three phase, 3 wire unbalanced load only

(C) three phase , 3 wire, balanced and unbalanced loads

(D) three phase four wire load

(E) Answer not known

88. In a moving coil instrument, the developed torque is

(A) directly proportional to square of the current

(B) inversely proportional to currents

(C) directly proportional to the flux density

(D) inversely proportional to the flux density

(E) Answer not known

89. Which of the following is not Piezo electric material?

(A) Quartz
(B) Cubic crystal
(C) Rochelle salt
(D) Barium titanate
(E) Answer not known

90. A metallic strain gauge with a gauge factor $k = 2$ is bonded to a steel member which is subjected to a stress of 10.5×10^9 N/m^2. If modulus of elasticity for steel is 21×10^{12} N/m^2, the fractional change in the resistance of the gauge due to the applied stress is

(A) 0.1%
(B) 0.01%
(C) 0.2%
(D) 0.02%
(E) Answer not known

91. The main function of limit switch in an electro pneumatic system is

(A) To generate compressed air
(B) To detect the position of an actuator
(C) To control the speed of an actuator
(D) To actuate the pneumatic cylinder
(E) Answer not known

92. In a building inspection a thermal image show a significant temperature gradient around a window frame, indicating

(A) Potential air leakage
(B) Sufficient insulation
(C) Surface reflectivity
(D) Inherent noise
(E) Answer not known

93. Synchronous capacitor is

(A) an ordinary static capacitor bank
(B) an under excited synchronous motor driving mechanical load
(C) an overexcited synchronous motor
(D) a synchronous motor running with normal excitation
(E) Answer not known

94. The condition for maximum efficiency in a DC machine is

(A) Iron losses - Copper losses
(B) Mechanical losses - Iron losses
(C) Variable losses - Constant losses
(D) Stray losses - Armature copper losses
(E) Answer not known

95. In a DC series motor, the torque developed is directly proportional to

(A) Armature current
(B) Square of armature current
(C) Speed
(D) Square of speed
(E) Answer not known

96. A 5 KVA, 400/200 V, 50 Hz single phase transformer has the following results during no load test 400 V, 1 A, 60 w. Calculate the resistance equivalent to core loss, R_o

(A) 2666.6 Ω
(B) 2000 Ω
(C) 1750 Ω
(D) 1000.7 Ω
(E) Answer not known

97. An AC voltage of 200 V at 50 Hz is applied to a coil which draws 5 amp and dissipates 1000 watts. The resistance and impedance of the coil respectively are

(A) 40 *ohms* and 40 *ohms*
(B) 10 ohms and 5 *ohms*
(C) 10 *ohms* and 30 *ohms*
(D) 200 *ohms* and 40 *ohms*
(E) Answer not known

98. Two resistors $R_1 = 12\,\Omega$ and $R_2 = 15\,\Omega$ are connected in parallel across a 9 V DC source. If the total current supplied by the source is 1.35 A, calculate the current drawn by $15\,\Omega$ resistor.

(A) 0.75 A
(B) 0.6 A
(C) 0.06 A
(D) 0.57 A
(E) Answer not known

99. In a serious RLC circuit, $R = 50\ \Omega$, $L = 0.1H$ $C = 5\mu F$. The bandwidth of the circuit is

(A) 1414.2 *Hz*
(B) 80.36 *Hz*
(C) 225 *Hz*
(D) 8 *kHz*
(E) Answer not known

100. The Resistance of a 100 W, 200 V lamp is

(A) 100 *ohm*
(B) 200 *ohm*
(C) 400 *ohm*
(D) 1600 *ohm*
(E) Answer not known

101. _____ are internet based voice and data communications where telecommunications applications, switching and storage are hosted by a third party outside of the organization using them and they are accessed over the public internet.

(A) Data communication services
(B) Telecommunication services
(C) Cloud communications
(D) Internet services
(E) Answer not known

102. Elastic ability in cloud computing means

(A) It provides the client with virtual machines in terms of physical machines
(B) It provides the ability to add and remove computing capacity on demand
(C) It provides the maximum capacity of systems
(D) It provides the fast deployment of physical machines
(E) Answer not known

103. Match the following regarding transport layer of computer networks.

(1)	Transport layer protocol	-	Ephemeral port number
(2)	Stop and wait protocol	-	Connectionless and connection oriented service
(3)	Defining processes	-	Error control-inefficient
(4)	Client program	-	Port number

(A) (4), (3), (1), (2) (B) (2), (3), (4), (1)

(C) (3), (2), (1), (4) (D) (2), (4), (1), (3)

(E) Answer not known

104. Check for the validity of the statements.

(i) Non adaptive algorithm do not base their routing divisions on measurements or estimates of the current traffic and topology.

(ii) Main function of the network layer is routing packets from source machine to destination machine.

(iii) Routing algorithm is a part of session layer.

(A) (i), (ii) and (iii) are true (B) (i) and (ii) are true

(C) (i) is true (D) (ii) and (iii) are true

(E) Answer not known

105. In _____ method of framing, each frame start and end with special bytes which is used as both starting and ending delimiter.

(A) flag bytes with byte stuffing (B) byte count
(C) flag bits with bit stuffing (D) flag bytes with bit stuffing
(E) Answer not known

106. Links that can be used in either direction but only oneway at a time is

(A) full duplex
(B) simplex
(C) half duplex
(D) both simplex and half duplex
(E) Answer not known

107. In HTTP response message, which status code indicates that a request was successful?

(A) 100 (B) 202
(C) 302 (D) 404
(E) Answer not known

108. The server responds to a client's RCPT command with a _____, which indicates that the user does not have a mailbox on this host.

(A) 231 code (B) 241 code
(C) 251 code (D) 261 code
(E) Answer not known

109. Which layer of the OSI model does MAC address operate on transmission?

(A) Application Layer
(B) Datalink Layer
(C) Network Layer
(D) Transport Layer
(E) Answer not known

110. Which of the following layer includes services of packetizing, using source and destination address in the packet header and CRC for error checking?

(A) Application Layer
(B) Datalink Layer
(C) Network Layer
(D) Transport Layer
(E) Answer not known

111. _____ replacement algorithm associates with each page the time when that page was brought into memory.

(A) LIFO
(B) FIFO
(C) FILO
(D) LRU
(E) Answer not known

112. Which one is implemented through cooperation between the operating system and the computer hardware?

(A) Addressing
(B) Texting
(C) Indexing
(D) Paging
(E) Answer not known

113. In _____, each process is contained in a single section of memory that is the section containing the next process.

(A) Primary memory allocation
(B) Process memory allocation
(C) Virtual memory allocation
(D) Contiguous memory allocation
(E) Answer not known

114. _____ is a technique that allows the execution of processes to share files easily and to implement shared memory.

(A) Main memory
(B) Virtual memory
(C) Logical memory
(D) Physical memory
(E) Answer not known

115. If there are 93 frames and 5 processors, each process will get 18 frames. The 3 leftover frames can be used as a free-frame byter tool. This scheme is called

(A) Equal allocation
(B) Proportional allocation
(C) Non-equal allocation
(D) None of the above
(E) Answer not known

116. _____ are particularly useful for sparse address spaces, where memory references are non contiguous and scattered throughout the address space.

(A) Inverted page table
(B) Hash page tables
(C) Page tables
(D) Clustered page tables
(E) Answer not known

117. Disk scheduling means

(A) Allocating RAM to processes
(B) Managing the CPU execution order
(C) Managing the order of disk I/O requests
(D) Replacing pages in memory
(E) Answer not known

118. The basic method for implementing paging involves breaking physical memory into fixed-sized blocks called

(A) Pages
(B) Blocks
(C) Frames
(D) Page offset
(E) Answer not known

119. Which of the following statements best describes a software interrupt?

(A) An interrupt caused by a physical device
(B) An interrupt initiated by a program instruction
(C) An interrupt that can only be disabled by the hardware
(D) An interrupt that always requires immediate attention
(E) Answer not known

120. The _____ for a page is set by the hardware whenever that page is referenced.

(A) Reference byte
(B) Reference bit
(C) Reference page
(D) Page fault
(E) Answer not known

121. The central idea behind the simple batch-processing scheme is the use of a piece of a software known as

(A) Monitor
(B) Kernel
(C) Editor
(D) Cursor
(E) Answer not known

122. The decision as to which available process will be executed by the processor is called

(A) Long term scheduling
(B) Medium term scheduling
(C) Short-term scheduling
(D) I/O scheduling
(E) Answer not known

123. What is the name of the program that runs first when a computer is turned on?

(A) Main memory
(B) Initializer
(C) Bootstrap program
(D) Kernel
(E) Answer not known

124. To overcome the problem of blocking threads is to use a technique refered to as

(A) Jacketing
(B) Swapping
(C) Deadlock
(D) Scheduling
(E) Answer not known

125. What is the main advantage of multicore programming?

(A) It allows a system to handle multiple programs simultaneously

(B) It improves the speed of sequential tasks by executing them on separate cores

(C) It enables multiple threads of a program to run simultaneously on separate cores

(D) It reduces the need for memory management

(E) Answer not known

126. If the wait for graph contains a cycle

(A) then a deadlock does not exist

(B) then a deadlock exists

(C) then the system is in a safe state

(D) neither deadlock exists or system is in a safe state

(E) Answer not known

127. A process is ———————— if it can affect or be affected by the other processes executing in the system.

(A) Cooperating

(B) Non-cooperating

(C) Independent

(D) Non-independent

(E) Answer not known

128. Consider the following table:

Process ID	CPU Burst	Arrival Time
P1	5	0
P2	7	2
P3	3	3

The completion order of the three processes under the policies FCFS and RR (CPU quantum of 2 time units) are:

(A) FCFS : P1, P2, P3 and RR : P1, P2, P3
(B) FCFS : P1, P2, P3 and RR : P3, P1, P2
(C) FCFS : P1, P2, P3 and RR : P3, P2, P1
(D) FCFS : P1, P3, P2 and RR : P1, P2, P3
(E) Answer not known

129. A unit of activity characterized by a single sequential thread of execution, a current state and an associated set of system resources is called

(A) Process
(B) Program
(C) Scheduling and resource management
(D) Memory management
(E) Answer not known

130. ———————— provides for communication among processors, main memory and I/O modules.

(A) System bug
(B) CPU
(C) Register
(D) Memory
(E) Answer not known

131. Arrange the ARM five stage instruction pipeline in chronological order

(1) Fetch – Loads an instruction from memory
(2) Execute – Process the instruction
(3) Decode – Identifies instruction to be executed
(4) Write – Write result back to a register
(5) Memory – Handles data access to/from memory

(A) (1), (2), (3), (4), (5)
(B) (3), (1), (2), (5), (4)
(C) (3), (2), (1), (5), (4)
(D) (1), (3), (2), (4), (5)
(E) Answer not known

132. Which of the following 8051 interrupts and their corresponding interrupt vector locations are incorrectly paired?

(1) Reset – 0000

(2) External hardware interrupt 0 – 0003

(3) Timer 0 interrupt – 0023

(4) Serial CoM interrupt – 000B

(A) (1) and (3) are incorrect

(B) (2) and (3) are incorrect

(C) (3) and (4) are incorrect

(D) (1) and (2) are incorrect

(E) Answer not known

133. Which among the following is not a valid bitwise operation in embedded C 8051 programming?

(A) $\sim 0 \times 55$

(B) $0 \times 54 \wedge 0 \times 78$

(C) $0 \times 04 \mid\mid 0 \times 68$

(D) 0×35 & 0×0 F

(E) Answer not known

134. Which among the following is correct expansion of AMBA?

(A) AMBA – ARM Microcontroller Bus Architecture

(B) AMBA – Advanced Microcontroller Based Account

(C) AMBA – Advanced Microcontroller Bus Architecture

(D) AMBA – ARM Microcontroller Based Architecture

(E) Answer not known

135. Which of the following IDE is incorrectly paired with its vendors?

(1) MPLAB – Microchip

(2) Pycharm – Czech

(3) Visual studio – Texas

(4) Code composer studio – Microsoft

(A) (1) and (3) are incorrect (B) (3) and (4) are incorrect

(C) (2) and (4) are incorrect (D) (1) and (2) are incorrect

(E) Answer not known

136. Which of the following statements are true about barrel shifter in an ARM processor?

(i) Barrel shifter perform shift and rotate instruction's operations on one of the operands.

(ii) Shift occurs within two cycle time of the instruction.

(iii) Preprocesses data before it enters the ALU.

(A) (i) and (iii) only (B) (i) and (ii) only

(C) (ii) and (iii) only (D) (i) only

(E) Answer not known

137. Arrange the following steps to build process for embedded software in chronological order.

(1) Linking all object files and locating on to single object file.

(2) Converting the object file in a form called hex file to ROM image.

(3) Compilation of project files such as source and library files.

(A) (3), (1), (2)
(B) (1), (2), (3)
(C) (2), (3), (1)
(D) (3), (2), (1)
(E) Answer not known

138. Which of the following results in an efficient structure arrangement in embedded C programming.

(i) Start structure with the smallest elements and finish with the largest.

(ii) Manually add podding.

(iii) Use lot of enum types in API structures.

(A) (i) and (ii) only
(B) (i) and (iii) only
(C) (iii) only
(D) (i) only
(E) Answer not known

139. Assertion [A] : Inline functions are used to declare new operations not supported by C compiler.

Reason [R] : Inline assembly is used to access ARM instructions supported by C compiler.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

140. Choose the correct pair of inter process communication

(1) Semaphores – POSIX IEEE standard

(2) Socket – Client server unidirectional link

(3) Process – Program in Execution

(4) Task control block – Stack pointer

(A) (1) and (3) are correct (B) (1) and (2) are correct

(C) (2) and (3) are correct (D) (3) and (4) are correct

(E) Answer not known

141. Match the instructions types with their corresponding mnemonics for 8051 microcontroller.

(a)	Logical	1.	ADD, SUBB, INC
(b)	Arithmetical	2.	ANL, URL, CQL
(c)	Branching	3.	MOV, XCH, PUSH
(d)	Data transfer	4.	LJMP, SJMP, AJMP

	(a)	(b)	(c)	(d)
(A)	2	3	4	1
(B)	2	1	4	3
(C)	4	3	2	1
(D)	3	4	1	2

(E) Answer not known

142. Select the pair of instruction with correct mapping address once the interrupts occur.

(1)	External 0	–	0003 H
(2)	Timer 0	–	0023 H
(3)	External 1	–	0013 H
(4)	Serial port	–	000 BH

(A) (2) and (3) are correct (B) (1) and (3) are correct

(C) (2) and (4) are correct (D) (1) and (4) are correct

(E) Answer not known

143. Choose the pair of incorrect operation of special function registers of 8051 microcontroller.

(1) DPL – Low bit data pointer
(2) DPH – High bit data pointer
(3) PSW – Program status word
(4) PCON – Power control

(A) (1) and (2) are correct
(B) (2) and (3) are correct
(C) (3) and (4) are correct
(D) (4) and (1) are correct
(E) Answer not known

144. Choose the pair of instructions whose operations are incorrectly stated

(1) PUSH F – Push flag to stack
(2) POP F – POP stack to flag
(3) SAHF – Store all to higher byte of flag register
(4) Load F – Load AH from lower byte of flag register

(A) (1) and (2)
(B) (2) and (3)
(C) (3) and (4)
(D) (4) and (1)
(E) Answer not known

145. Cache memory in embedded processors improves
(A) Code portability
(B) Memory fragmentation
(C) Performance
(D) Debugging
(E) Answer not known

146. Choose the correct matches of the features of 8086 microprocessor choose the right matches among type.

(1) Address Bus of 8086 – 20 bit

(2) Data Bus of 8086 – 32 bit

(3) Initial clock speed of 8086 – 15MHZ

(4) Addressable memory of 8086 – 1m

(A) (1) and (2) are correct
(B) (2) and (3) are correct
(C) (3) and (4) are correct
(D) (4) and (1) are correct
(E) Answer not known

147. Choose the pair of incorrect MNEMONICS for instructions which the operations are wrongly stated.

(1) LEA – Load Effective address

(2) XCHG – Exchange

(3) XLAT – Terminate

(4) SAHF – Stack All to lower byte of flag reg

(A) (1) and (2) are correct (B) (2) and (3) are correct

(C) (3) and (4) are correct (D) (4) and (1) are correct

(E) Answer not known

148. Assertion [A] : 8086 is best seed execution and more powerful Instruction set

Reason [R] : More process capacity due to 8086 16 bit data circle 16 bit process.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true

(C) Both [A] and [R] are false

(D) [A] is false and [R] is true

(E) Answer not known

149. Assertion [A] : When a microprocessor communicates with the outside world, it provides the data in byte - sized chunk such as printers. In this case 8-bit data path is expensive

Reason [R] : Serial communication is used for transferring data between two system located at distance of hundreds of feet to millions of miles apart.

(A) [A] is true but [R] is false

(B) [A] is false but [R] is true

(C) Both [A] and [R] are true and [R] is the correct explanation of [A]

(D) Both [A] and [R] are true and [R] is not the correct explanation of [A]

(E) Answer not known

150. Emulators would be helpful in embedded system for

(A) Running software in faster manner

(B) Converting code into machine language

(C) Simulating target system behavior during development

(D) Minimizing RAM usage

(E) Answer not known

151. Which of the following is not true about Logical data Independence

(1) Capacity to change the internal schema without changing the conceptual schema

(2) Capacity to change conceptual schema without changing external schema

(3) Capacity to change internal schema by changing the conceptual schema

(4) Capacity to change conceptual schema changing the internal schema

(A) (1) and (2)
(B) (1), (3) and (4)
(C) (1) only
(D) (2) only
(E) Answer not known

152. Match the transaction properties below

(a)	Atomicity	1.	Ensures that once transaction is completed, updates and modification are written to disk.
(b)	Consistency	2.	Ensures that each transaction appears to execute in isolation when multiple transactions execute concurrently
(c)	Isolation	3.	Ensures that either all the Database operations in a transaction are executed or none
(d)	Durability	4.	Ensures that a database remains in a valid state before and after a transaction

	(a)	(b)	(c)	(d)
(A)	3	4	2	1
(B)	4	3	1	2
(C)	3	1	4	2
(D)	2	3	1	4

(E) Answer not known

153. Which of the following is not the advantage of DBMS

(1) Redundancy control

(2) Restricting unauthorized Access

(3) Analysing code

(4) Providing Backup and Recovery

(A) (1) and (3) (B) (3) only

(C) (2) and (4) (D) (2) only

(E) Answer not known

154. ———————— describes database structure, size of datatypes, constraints, authorisation

(A) Dictionary (B) Meta data

(C) Database schema (D) Querry Processor

(E) Answer not known

155. ———————— is the logical design of the database and ———————— is the snapshot of the data in the database at a given instant in time.

(A) Relational table, table values

(B) Database schema, Database instance

(C) Relational schema, Entity values

(D) Database schema, No of rows in the table

(E) Answer not known

156. ———————— SQL features allow SQL code to be called from a host language such as C or COBOL.

(A) Embedded
(B) Dynamic
(C) DDL
(D) DML
(E) Answer not known

157. An index is said to be ———————— if it contains (atleast) one data entry for each search key value that appears in a record in the indexed file.

(A) Dense
(B) Sparse
(C) Clustered
(D) Forest
(E) Answer not known

158. The pages in a hashed file are grouped into.

(A) Hashed
(B) Buckets
(C) Overflow
(D) Function
(E) Answer not known

159. A relations R is in ———————— if and only if the following conditions are satisfied simultaneously

(1) R is already in 4NF

(2) It cannot be further non-loss decomposed

(A) 2 NF
(B) 5 NF
(C) BCNF
(D) 3 NF
(E) Answer not known

160. If A is the determinant and B is the determined then we say that A ———————— B and is graphically represented as A → B.

(A) Component
(B) Value of
(C) Functionally determines
(D) Attribute of
(E) Answer not known

161. Which of the following structures, plastic deformation by twinning occurs.

(1) Body – centered cubic

(2) Face – centered cubic

(3) Hexagonal close – Packed

(A) (1) and (2) only
(B) (1) and (3) only
(C) (2) and (3) only
(D) (1), (2) and (3)
(E) Answer not known

162. Match it correctly

(a)	Ferromagnetism	1.	Magnetic moments of atoms cancel out
(b)	Ferrimagnetism	2.	Alignment of electron spins when the magnetic field is applied
(c)	Paramagnetism	3.	Alignment of magnetic moment in the same direction
(d)	Anti Ferromagnetism	4.	Magnetic moments aligned in antiparallel arrangement

	(a)	(b)	(c)	(d)
(A)	3	4	2	1
(B)	3	4	1	2
(C)	4	3	2	1
(D)	4	3	1	2

(E) Answer not known

163. Which of the following is/are true regarding non polar dielectrics

(1) The centre of gravity of the positive and negative charges coincide in the absence of an external field.

(2) In an external electric field, an induced dipole moment appears which is inversely proportional to the electric field intensity

(A) (1) only

(B) (2) only

(C) Both (1) and (2)

(D) Both (1) and (2) are incorrect

(E) Answer not known

164. Which plastic have the structure of a thermoplastic but the non melting characteristic of a thermoset?

(A) Polycarbonates
(B) Polyimides
(C) Polystyrenes
(D) Polysulfones
(E) Answer not known

165. Assertion [A] : In the case of highly cross-linked polymers, the slope of the curve changes only gradually near glass-transition temperature in the plot between specific volume and temperature.

Reason [R] : So it is easy to determine glass-transition temperature for cross-linked polymer.

(A) Both [A] and [R] are true; and [R] is the correct explanation of [A]
(B) [A] is true but [R] is false
(C) [A] is false but [R] is true
(D) Both [A] and [R] are true; and [R] is not the correct explanation of [A]
(E) Answer not known

166. Which of the following statements are true regarding joining test?

(1) It used to evaluate hardenability

(2) An martensite steel bar is quenched at one end only

(3) It producing a range of cooling rates along the bar

(A) (1) and (2) only
(B) (2) and (3) only
(C) (1) and (3) only
(D) (1), (2) and (3)
(E) Answer not known

167. Match it correctly

(a)	Ductile cast iron	1.	Graphite in flakes form
(b)	Grey cast iron	2.	Graphite precipitates in sphere form
(c)	Malleable cast iron	3.	Cementite decomposes to produce rounded clumps of graphite
(d)	White cast iron	4.	Produces cementite rather than graphite

	(a)	(b)	(c)	(d)
(A)	1	2	3	4
(B)	1	2	4	3
(C)	2	1	3	4
(D)	2	1	4	3

(E) Answer not known

168. A line on a phase diagram that shows constant chemical composition

(A) Tie line
(B) Isopleth
(C) Isotherm
(D) Liquidus
(E) Answer not known

169. Which of the following is/are false regarding Homogenization heat treatment?

(1) It reduce the microsegregation caused by equilibrium solidification
(2) It reduce the microsegregation caused by non equilibrium solidification
(3) It reduce the macrosegregation caused by equilibrium solidification
(4) It reduce the macrosegregation caused by non equilibrium solidification

(A) (1) and (2) only
(B) (2) and (4) only
(C) (1), (3) and (4) only
(D) (2), (3) and (4) only
(E) Answer not known

170. Which of the following statements are true with respect to solid-solution strengthening?

(1) The yield strength of the alloy are greater than those of pure metals

(2) The ductility of the alloy is less than that of the pure metal

(3) The electrical conductivity of the alloy is much higher than that of pure metal

(4) The resistance to creep and strength at elevated temperatures is reduced by solid-solution strengthening

(A) (1) and (2) only
(B) (3) and (4) only
(C) (1) and (3) only
(D) (2) and (4) only
(E) Answer not known

171. A line shaft rotating at 200 rpm is to transmit 22 kW. The shaft may be assumed to be made of mild steel. Determine the torque transmitted by the shaft

(A) 950 N.m
(B) 1050 N.m
(C) 1250 N.m
(D) 1550 N.m
(E) Answer not known

172. A circular bar of length (l) uniformly tappers from diameter (d_1) at one end to diameter (d_2) at the other end. If the bar is subjected to an axial tensile load (p), then its elongation is equal to

(A) $Ed_1d_2/4p$ (B) $4\,pl/Ed_1d_2$

(C) $4l/\pi\, d_1\, d_2$ (D) $4\,pl/\pi\, Ed_1\, d_2$

(E) Answer not known

173. The friction torque for the flat pivot with uniform pressure is given by where,

μ – Coefficient of friction

W – Axial load

R – Radius of pivot

(A) 6/7 μWR (B) 8/5 μW

(C) 4/10 WR (D) 2/3 $\mu\, WR$

(E) Answer not known

174. The curve traced by a particle while moving along a screw thread is known as

(A) Helix (B) Lead

(C) Pitch (D) Helix Angle

(E) Answer not known

175. _____ is a gear at the center of a gear train, whereas the planet gears are the gears whose axes move around that gear.

(A) Sun gear
(B) Annular gear
(C) Compound gear
(D) Simple gear
(E) Answer not known

176. The minimum number of teeth on the pinion which will mesh with 20° stub involute gear without interference is

(A) 12
(B) 10
(C) 17
(D) 14
(E) Answer not known

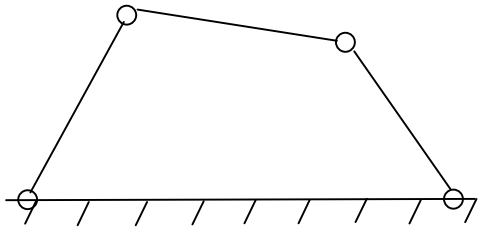
177. _____ is the radial distance of the tooth above pitch circle.

(A) Tooth thickness
(B) Circular pitch
(C) Addendum
(D) Dedendum
(E) Answer not known

178. Find the mass moment of Inertia of the disc. The given datas are : mass of the disc = 5 kg and radius of gyration = 0.06 m

(A) 1.217 kgm^2
(B) 0.757 kgm^2
(C) 0.617 kgm^2
(D) 0.018 kgm^2
(E) Answer not known

179. Find the degree of freedom for the following figure of four-bar kinematic chain with revolute joints.



(A) 2 (B) 1

(C) 4 (D) 3

(E) Answer not known

180. The relation between the number of Pairs (P) and number of Links (L) in a planar four link kinematic chain is given by

(A) $L = 8 - 6P$ (B) $L = 2P - 4$

(C) $L = 6\ P - 8$ (D) $L = P - 2$

(E) Answer not known

181. The mathematical model of an linear programming problem is important because

(A) It helps in converting the verbal description and numerical data into a mathematical expression

(B) Decision makers prefer to work with formal models

(C) It captures the relevant relationship among decision factors

(D) It enables the use of algebraic technique

(E) Answer not known

182. What is the rule for the earliest start time in Critical Path Method (CPM)?

(A) It compares the activity's start time to that of a successor activity

(B) It compares the activity's end time to that of a previous activity

(C) It specifies when a project may begin

(D) It establishes the start date for a project

(E) Answer not known

183. The similarity between assignment problem and transportation problem is

(A) Both are rectangular matrices

(B) Both can be solved by graphical method

(C) Both have negativity constraints

(D) Both have objective function and non-negative constraints

(E) Answer not known

184. How many occupied cells must a transportation matrix with 8 rows and 7 columns have so that it does not degenerate?

(A) 15 (B) 14

(C) 55 (D) 56

(E) Answer not known

185. The ordering cost per order and average unit carrying cost are constant and demand suddenly falls by 75% then EOQ will be

(A) Decreases by 50%
(B) Does not change
(C) Increases by 50%
(D) Decreases by 40%
(E) Answer not known

186. The cost of providing service in a queuing system increases with

(A) Increased mean time in the queue
(B) Decreased mean time in the queue
(C) Increased arrival rate
(D) Decreased arrival rate
(E) Answer not known

187. On an average 120 customers arrives at a place each hour, and on the average the server can process 150 customers per hour. What will be the proportion of time the server is idle?

(A) 0.2
(B) 0.1
(C) 0.3
(D) 0.4
(E) Answer not known

188. Assignment of work to manpower and machinery is known as

(A) Formulation
(B) Scheduling
(C) Loading
(D) Reporting
(E) Answer not known

189. If there are 'm' sources and 'n' destinations in a transportation matrix, the total number of basic variables in a basic feasible solution is

(A) $m + n + 1$ (B) m

(C) $m + n - 1$ (D) $m + 1$

(E) Answer not known

190. Which of the following is a type of plant layout in which the machines and equipments are arranged in small groups according to their function?

(A) Process layout (B) Combined layout

(C) Fixed position layout (D) Cellular layout

(E) Answer not known

191. Alloying of tungsten with steel yields

(A) Improves hardness at elevated temperature

(B) Improves machinability at elevated temperature

(C) Improves refractory property at elevate temperature

(D) None of the above

(E) Answer not known

192. When rolled steel is stretched during sheet forming, it experiences yield point elongation that results in _____. This effect is controlled by _____ rolling, which involves a reduction of 0.5 – 1.5%.

(A) Wavy edges, temper rolling
(B) Luder's bands, temper rolling
(C) Alligatoring, temper rolling
(D) Cracks, temper rolling
(E) Answer not known

193. The common method of avoiding crown in case of rolling is

(A) Providing thermal camber for sheets
(B) Providing camber for rolls
(C) Providing crown removers at strips
(D) None of the above
(E) Answer not known

194. A major advantage of abrasive water set machining over conventional machining is :

(A) Minimal heat affected zone
(B) Start hole is required
(C) Amount of burr generated is extremely high
(D) Most parts require extensive fixturing
(E) Answer not known

195. In ultrasonic machining, the tool does not

(A) Make high frequency vibrations
(B) Contact the workpiece directly
(C) Transfer ultrasonic vibrations to abrasive particles
(D) Remove material by micro-chipping
(E) Answer not known

196. In ECM process MRR is based on

1. Atomic weight
2. Valency
3. Current passed
4. Time of current flow

(A) 1, 2 only
(B) 3, 4 only
(C) 1, 2, 3 only
(D) 1, 2, 3 and 4
(E) Answer not known

197. Vitrified bond in grinding process is also called as

(A) Ceramic bond
(B) Chemical bond
(C) Self lubricated bond
(D) Mechanical bond
(E) Answer not known

198. In a broach tool, the cutting teeth are arranged in :

(A) Random order

(B) Increasing order of size

(C) Equal size throughout

(D) Decreasing order of size

(E) Answer not known

199. The lead screw of a centre lathe has a pitch of 6 mm. If a thread with a pitch of 1.5 mm is to be cut on a workpiece rotating at 120 rpm, what should be the rpm of the lead screw?

(A) 20 rpm

(B) 30 rpm

(C) 120 rpm

(D) 180 rpm

(E) Answer not known

200. How does a mold's solidification process take place?

1. Contraction of the molten metal ASIT cools prior to it's solidification.

2. Contraction of the metal during phase change (Latent heat of fusion)

3. Contraction of casting as its temperature drops to ambient temperature

(A) by 1 only

(B) by 1, 2 only

(C) by 1, 2, 3

(D) by 3 only

(E) Answer not known