



- C Mixture of fuel and air      D Any one of above
11. A 100 c.c. IC engine means that its
- A Swept volume is 100 c.c.      B Clearance volume is 100 c.c.
- C Clearance + swept volume is 100 c.c.      D Swept – clearance volume is 100 c.c.
12. Three resistors, each having value of  $0.069\text{M}\Omega$ , are connected in parallel. The total resistance of the parallel combination is
- A  $23\Omega$       B  $23\text{K}\Omega$
- C  $204\Omega$       D  $0.2\text{M}\Omega$
13. In an electrical network, junction of branches at a common point is called
- A Loop      B Mesh
- C Node      D Joint branch
14. Kirchhoff laws fail in the case of
- A linear networks      B nonlinear networks
- C dual networks      D distributed parameter networks
15. Principle of statically induced emf is used in
- A Transformer      B electric motor
- C Generator      D Battery
16. Priming is required in
- A Gear pump      B Screw pump
- C Reciprocating pump      D Centrifugal pump
17. The usual expansion device used in window air conditioner is
- A Capillary tube      B Automatic expansion valve
- C Float valve      D Hand expansion valve
18. The ratio of the ultimate stress to the design stress is known as
- A Elastic limit      B Strain
- C Factor of safety      D Bulk modulus
19. The unit of linear acceleration is
- A Kg-m      B m/s
- C  $\text{m/s}^2$       D  $\text{rad/s}^2$
20. The mechanism forms a structure, when the number of degree of freedom (n) of a mechanism is equal to

- |   |   |   |   |
|---|---|---|---|
| A | 0 | B | 1 |
| C | 2 | D | 4 |
21. Dual of a Dual of given problem is
- |   |             |   |               |
|---|-------------|---|---------------|
| A | Primal      | B | Dual          |
| C | Primal dual | D | None of these |
22. Transportation problem is basically a
- |   |                       |   |                    |
|---|-----------------------|---|--------------------|
| A | Maximization model    | B | Minimization model |
| C | Transshipment problem | D | Iconic model       |
23. VAM in operations research stands for
- |   |                    |   |                              |
|---|--------------------|---|------------------------------|
| A | Value added method | B | Value assessment method      |
| C | Vogel Adam method  | D | Vogel's approximation method |
24. The Assignment Problem of operations research is solved by
- |   |                  |   |                  |
|---|------------------|---|------------------|
| A | Simplex method   | B | Hungarian method |
| C | Graphical method | D | Vector method    |
25. Group replacement policy is most suitable for
- |   |                    |   |                 |
|---|--------------------|---|-----------------|
| A | Trucks             | B | Infant machines |
| C | Street light bulbs | D | New cars        |
26. The objective of Operations Research is
- |   |                                         |   |                                           |
|---|-----------------------------------------|---|-------------------------------------------|
| A | To find new methods of solving Problems | B | To derive formulas                        |
| C | To utilize the services of scientists   | D | Optimal utilization of existing resources |
27. Pressure is defined as
- |   |                       |   |                       |
|---|-----------------------|---|-----------------------|
| A | Area per unit force   | B | Force per unit volume |
| C | Volume per unit force | D | Force per unit area   |
28. Weight of any substance is defined as
- |   |                                   |   |                 |
|---|-----------------------------------|---|-----------------|
| A | Mass x gravitational acceleration | B | Mass x pressure |
| C | Mass x force                      | D | Mass x density  |
29. Force on piston is calculated as
- |   |                             |   |                                    |
|---|-----------------------------|---|------------------------------------|
| A | Piston area x piston volume | B | Pressure x piston area             |
| C | Pressure x piston diameter  | D | Pressure x temperature in cylinder |

30. Twisting couple in a shaft introduces in it
- |   |                |   |              |
|---|----------------|---|--------------|
| A | Bending moment | B | Deflection   |
| C | Shear strain   | D | Shear stress |
31. Mohr's circle can be used to determine following stress on inclined surface
- |   |                   |   |                      |
|---|-------------------|---|----------------------|
| A | Principal stress  | B | Normal stress        |
| C | Tangential stress | D | Maximum shear stress |
32. Shear force diagram for a cantilever beam carrying a uniformly distributed load over its length is a
- |   |           |   |           |
|---|-----------|---|-----------|
| A | Triangle  | B | Rectangle |
| C | Hyperbola | D | Parabola  |
33. A bar when subjected to an axial pull P
- |   |                                                        |   |                                                        |
|---|--------------------------------------------------------|---|--------------------------------------------------------|
| A | Decrease in length and width and increase in thickness | B | Decrease in length and increase in width and thickness |
| C | Increase in length and decrease in Width and thickness | D | Increase in length, width and thickness                |
34. In the elastic region of material deformation stress is
- |   |                            |   |                        |
|---|----------------------------|---|------------------------|
| A | Not proportional to strain | B | Proportional to strain |
| C | Unrelated to strain        | D | None of these          |
35. When the tool moves parallel to the lathe axis, the movement is termed as
- |   |                 |   |                   |
|---|-----------------|---|-------------------|
| A | Cross feed      | B | Angular feed      |
| C | Rotational feed | D | Longitudinal feed |
36. A dynamometer is a device used for the measurement of
- |   |                          |   |                                |
|---|--------------------------|---|--------------------------------|
| A | Chip thickness ratio     | B | Forces during metal cutting    |
| C | Wear of the cutting tool | D | Deflection of the cutting tool |
37. Long and flat surfaces can be manufactured on
- |   |         |   |               |
|---|---------|---|---------------|
| A | shaper  | B | Planar        |
| C | Slotter | D | None of these |
38. What is the shape of cross section, when a cylinder whose diameter is equal to its length, is cut along its axis?
- |   |          |   |          |
|---|----------|---|----------|
| A | Ellipse  | B | Triangle |
| C | Pentagon | D | Square   |
39. Multipoint cutting tools are used on \_\_\_\_\_ machine.

- |   |         |   |                   |
|---|---------|---|-------------------|
| A | Lathe   | B | Shaper            |
| C | Milling | D | None of the above |
40. In which view, true length of a line is seen, when it is parallel to horizontal plane and inclined to vertical plane.
- |   |            |   |              |
|---|------------|---|--------------|
| A | Front view | B | Top view     |
| C | Side view  | D | Both A and B |
41. Which abrasives are used to make grinding wheel?
- |   |                 |   |                  |
|---|-----------------|---|------------------|
| A | Graphite powder | B | SiC              |
| C | Granite         | D | All of the above |
42. Dielectric fluid is used in \_\_\_\_\_.
- |   |                             |   |                       |
|---|-----------------------------|---|-----------------------|
| A | Electro chemical machining  | B | Ultra sonic machining |
| C | Electro discharge machining | D | Laser machining       |
43. Which of the following is not a requirement of a good pattern in casting process?
- |   |                                               |   |                                                    |
|---|-----------------------------------------------|---|----------------------------------------------------|
| A | It should be light in weight to handle easily | B | It should be smooth to make casting surface smooth |
| C | It should have low strength to break it       | D | none of the above                                  |
44. Permeability can be defined as the property of molding sand
- |   |                                                                     |   |                              |
|---|---------------------------------------------------------------------|---|------------------------------|
| A | to allow gases to escape easily from the mold                       | B | to hold sand grains together |
| C | to withstand the heat of melt without showing any sign of softening | D | none of the above            |
45. Which of the following production processes is least flexible?
- |   |                 |   |                   |
|---|-----------------|---|-------------------|
| A | Mass production | B | Batch production  |
| C | Job production  | D | None of the above |
46. Tempering heat treatment is used for \_\_\_\_\_.
- |   |                         |   |                             |
|---|-------------------------|---|-----------------------------|
| A | Hardening the component | B | Releasing internal stresses |
| C | Producing martensite    | D | Making brittle component    |
47. Which quantity can be measured by bourdon tube?
- |   |              |   |          |
|---|--------------|---|----------|
| A | Illumination | B | Velocity |
|---|--------------|---|----------|

- |                  |                |
|------------------|----------------|
| C     Resistance | D     Pressure |
|------------------|----------------|
48. The batteries are connected in series to increase \_\_\_\_\_ .
- |                            |                            |
|----------------------------|----------------------------|
| A     The voltage capacity | B     The current capacity |
| C     Both A and B         | D     None of the above    |
49. The frequency of emf generated by a generator depends upon its
- |                    |                         |
|--------------------|-------------------------|
| A     Speed        | B     Number of poles   |
| C     Both A and B | D     None of the above |
50. Carbon brushes are used in electric motors to
- |                                           |                                          |
|-------------------------------------------|------------------------------------------|
| A     prevent sparking during commutation | B     provide a path for flow of current |
| C     to deposit carbon on commutator     | D     None of the above                  |
51. In PLC, for sensing the temperature in any processing line, a temperature sensor can be connected with
- |                          |                           |
|--------------------------|---------------------------|
| A     Digital input card | B     Digital output card |
| C     Analog input card  | D     Analog output card  |
52. A 16 bit address bus can generate \_\_\_\_\_ addresses.
- |             |                         |
|-------------|-------------------------|
| A     32737 | B     65536             |
| C     25525 | D     None of the above |
53. The left side of any binary number is called
- |                              |                             |
|------------------------------|-----------------------------|
| A     Most significant bit   | B     Least significant bit |
| C     Medium significant bit | D     Low significant bit   |
54. The software used to drive microprocessor-based systems is called
- |                             |                         |
|-----------------------------|-------------------------|
| A     Assembly language     | B     Firmware          |
| C     Machine language code | D     None of the above |
55. 2-R robotic manipulator is a \_\_\_\_\_ robot.
- |                    |                     |
|--------------------|---------------------|
| A     Planar       | B     Spatial       |
| C     Both A and B | D     None of these |
56. SCARA robot has compliance for \_\_\_\_\_.
- |                                |                           |
|--------------------------------|---------------------------|
| A     Welding operation        | B     Machining operation |
| C     Spray painting operation | D     Assembly operation  |
57. Cartesian robot configuration is used for

- |   |                              |   |                    |
|---|------------------------------|---|--------------------|
| A | Heavy load lifting operation | B | Accurate operation |
| C | Both A and B                 | D | None of these      |
58. Which of the following can be used as position sensor?
- |   |               |   |              |
|---|---------------|---|--------------|
| A | Synchros      | B | Encoder      |
| C | Potentiometer | D | All of these |
59. At the center of Fourier transform of digital image \_\_\_\_\_ frequency components are available.
- |   |      |   |               |
|---|------|---|---------------|
| A | Low  | B | Medium        |
| C | High | D | None of these |
60. Thermocouples are used to measure \_\_\_\_\_.
- |   |          |   |             |
|---|----------|---|-------------|
| A | Pressure | B | Temperature |
| C | Velocity | D | Current     |
61. Open-loop control system is
- |   |                                                |   |                                               |
|---|------------------------------------------------|---|-----------------------------------------------|
| A | less accurate than closed-loop control system  | B | more accurate than closed-loop control system |
| C | equally accurate to closed-loop control system | D | cannot compare with each other                |
62. Several machine tools can be controlled by a central computer in
- |   |                                             |   |                                               |
|---|---------------------------------------------|---|-----------------------------------------------|
| A | NC (Numerical Control) machine tool         | B | CNC (Computer Numerical Control) machine tool |
| C | DNC (Direct Numerical Control) machine tool | D | All of the above                              |
63. Robot force sensing is done by
- |   |          |   |              |
|---|----------|---|--------------|
| A | Encoders | B | Strain gauge |
| C | Synchros | D | Resolvers    |
64. How many gray levels are present in 8 bit system for a digital image?
- |   |     |   |     |
|---|-----|---|-----|
| A | 256 | B | 128 |
| C | 64  | D | 32  |
65. Edge enhancement in digital image is possible with the help of \_\_\_\_\_ filters.
- |   |          |   |           |
|---|----------|---|-----------|
| A | Median   | B | Average   |
| C | Low pass | D | High pass |
66. Which of the following terms refers to the use of compressed gasses to drive (power) the automatic machine?

- |   |                |   |           |
|---|----------------|---|-----------|
| A | piezo electric | B | Electric  |
| C | hydraulic      | D | Pneumatic |
67. Radar, infrared and ultrasound sensors measure the \_\_\_\_\_ physical property.
- |   |          |   |             |
|---|----------|---|-------------|
| A | Pressure | B | Inclination |
| C | Distance | D | Contact     |
68. According to Joule's law, the internal energy of a perfect gas is the function of absolute \_\_\_\_
- |   |             |   |          |
|---|-------------|---|----------|
| A | Temperature | B | Density  |
| C | Volume      | D | Pressure |
69. How is absolute pressure measured?
- |   |                                       |   |                                       |
|---|---------------------------------------|---|---------------------------------------|
| A | Gauge pressure x Atmospheric pressure | B | Gauge pressure / Atmospheric pressure |
| C | Gauge pressure + Atmospheric pressure | D | Gauge pressure - Atmospheric pressure |
70. In an isolated system, \_\_\_\_\_ can be transferred between the system and its surrounding.
- |   |                      |   |                         |
|---|----------------------|---|-------------------------|
| A | only energy          | B | only mass               |
| C | both energy and mass | D | neither energy nor mass |
71. Which gears are used to connect two intersecting shaft axes?
- |   |                      |   |                     |
|---|----------------------|---|---------------------|
| A | Crossed helical gear | B | Worm and worm wheel |
| C | Bevel gears          | D | All of the above    |
72. Why is an idler gear used in gear trains?
- |   |                                        |   |                                                                    |
|---|----------------------------------------|---|--------------------------------------------------------------------|
| A | To have required direction of rotation | B | To obtain minimum centre distance between driving and driven shaft |
| C | To increase the speed                  | D | None of the above                                                  |
73. Which type of bearings is known as anti friction bearings?
- |   |                          |   |                  |
|---|--------------------------|---|------------------|
| A | Sliding contact bearings | B | Journal bearings |
| C | Rolling contact bearings | D | All of the above |
74. Which among the following is not a type of Non-destructive testing?
- |   |                    |   |                      |
|---|--------------------|---|----------------------|
| A | compression test   | B | visual observation   |
| C | ultrasonic testing | D | eddy current testing |
75. Which type of mechanism is used in shaper machine?
- |   |                          |   |                   |
|---|--------------------------|---|-------------------|
| A | Four-bar chain mechanism | B | Lifting mechanism |
| C | Quick return mechanism   | D | Scaling mechanism |



76. Which type of chips form while machining of brittle materials?
- A Discontinuous chips                      B Continuous chips
- C Continuous chips with built-up edge                      D All of the above
77. The cutting tool removes the metal from workpiece in the form of
- A Solid blocks                      B Chips
- C Both A and B                      D None of the above
78. In which process the material is removed due to the action of abrasive grains?
- A Ultrasonic Machining (USM)                      B Electro-Chemical Machining (ECM)
- C Laser Beam Machining (LBM)                      D Electrical Discharge Machining (EDM)
79. The product of casting process is called
- A a mould                      B a cavity
- C a pattern                      D a casting
80. A Sine Bar is used to measure
- A Diameter                      B Thickness
- C Width                      D Angle
81. Which function have Laplace Transform even it is not piecewise continuous in the range  $t \geq 0$ .
- A  $\frac{1}{\sqrt{t}}$                       B All of these
- C  $\frac{1}{\sqrt{t^3}}$                       D  $\frac{1}{\sqrt{t^2}}$
82. Complementary function of  $(D^2 + 4)y = \tan 200x$ .
- A  $(A \cosh 2x + B \sinh 2x)$                       B  $(A \cos 2x + B \sin 2x)$
- C  $(A \cos 2x - B \sin 2x)$                       D  $(A \cosh 2x - B \sinh 2x)$
83. In a Poisson distribution if 'n' is the number of trials and 'p' is the probability of success then the mean value is given by.
- A  $m = n.p$                       B  $m = n.q$
- C  $m = np(1-p)$                       D  $m = p$
84. It took 14 sec for a mercury thermometer to rise from  $-19^\circ\text{C}$  to  $100^\circ\text{C}$  when it was taken from a freezer and placed in boiling water. Somewhere along the way the mercury was rising at the rate of \_\_\_\_\_  $^\circ\text{C}/\text{sec}$ .

- |   |    |   |     |
|---|----|---|-----|
| A | 5  | B | 8.5 |
| C | 10 | D | 12  |

85. The value of  $c$  in Rolle's theorem for the function  $f(x) = \frac{x(x+1)}{x^2}$  defined on  $[-1, 0]$  is.

- |   |                  |   |                  |
|---|------------------|---|------------------|
| A | 0.5              | B | $(1+\sqrt{5})/2$ |
| C | $(1-\sqrt{5})/2$ | D | -0.5             |

86. The Particular integral of  $(D^2 + a^2)y = \sin ax$  is.

- |   |                         |   |                         |
|---|-------------------------|---|-------------------------|
| A | $\frac{x}{2a} \cos ax$  | B | $-\frac{x}{2a} \cos ax$ |
| C | $-\frac{ax}{2} \cos ax$ | D | $\frac{ax}{2} \cos ax$  |

87. Mean of binomial probability distribution is 857.6 and probability is 64% then number of values of binomial distribution.

- |   |      |   |      |
|---|------|---|------|
| A | 1040 | B | 1340 |
| C | 1240 | D | 1140 |

88.  $f(Z) = \bar{Z}$  is differentiable.

- |   |             |   |               |
|---|-------------|---|---------------|
| A | Nowhere     | B | Only at $Z=0$ |
| C | Every Where | D | Only at $Z=1$ |

89. The residue of  $f(Z) = \cot Z$  at each pole is.

- |   |     |   |      |
|---|-----|---|------|
| A | 0   | B | 1    |
| C | 0.5 | D | None |

90. Newton-Raphson method is used to find the root of the equation  $x^2 - 2 = 0$ . If iterations are started from -1, the iterations will be

- |   |                         |   |                        |
|---|-------------------------|---|------------------------|
| A | converge to -1          | B | converge to $\sqrt{2}$ |
| C | converge to $-\sqrt{2}$ | D | not converge           |

91.  $L(\sinh at)$  is

- |   |                       |   |                                |
|---|-----------------------|---|--------------------------------|
| A | $e^{at}$              | B | $\frac{s}{s^2 - a^2}$          |
| C | $\frac{a}{s^2 - a^2}$ | D | Exists only if 't' is complex. |

92. The poles of  $f(Z) = \frac{Z^2 + 1}{1 - Z^2}$  is

- |   |       |   |    |
|---|-------|---|----|
| A | 1     | B | -1 |
| C | 1, -1 | D | 0  |

93. The value of  $\int_{-\infty}^{\infty} e^{-t} \sin(t) dt = ?$

- |   |      |   |      |
|---|------|---|------|
| A | 0.50 | B | 0.25 |
| C | 0.17 | D | 0.12 |

94. Which of the following differential equation is linear?

- |   |                                  |   |                               |
|---|----------------------------------|---|-------------------------------|
| A | $\frac{dy}{dx} + x^2 y = \cos x$ | B | $\frac{dy}{dx} + y^2 x = x^2$ |
|---|----------------------------------|---|-------------------------------|

C  $(x+y)\frac{dx}{dy} + y = 0$

D  $\frac{dy}{dx} + y(x+y) = x^2$

95. The convergence of which of the followings method is sensitive to starting value?

A False position

B Gauss seidal method

C Newton-Raphson method

D ) All of these

96. If  $f(a) = 0$  and  $f'(a) \neq 0$ , then  $Z=a$  is called a.....

A Simple zero

B Simple curve

C Zero of order n

D None

97. The minimum value of  $\sec x$ ,  $x \in [\frac{2\pi}{3}, \pi]$  is

A 1

B -1

C 2

D  $\pi$

98.  $L(\cosh at)$  is.

A  $\frac{s}{s^2 - a^2}$

B  $\frac{s+a}{s-a}$

C Indeterminate

D  $(\sinh(at))^2$

99. If  $u(x, y, z) = \sqrt{x^3 + y^3 + z^3 + 3xyz}$ , then degree of  $u =$

A 3/2

B 2

C 1

D 1/2

100. Using trapezoidal rule, taking 10 equal interval  $\int_0^1 \sin x dx$  will be

A 1.902

B 1.941

C 1.888

D 1.984