

1. A body with mass 1200 kg is located on a 10 degrees inclined plane. What is the pulling force without friction?
 - A. 2044N
 - B. 1200N
 - C. 120N
 - D. None of these

2. What is one dyne equal to?
 - A. 10^{-3} N
 - B. 10^{-4} N
 - C. 10^{-5} N
 - D. 10^{-6} N

3. Which of the following are coplanar concurrent forces?
 - A. They are the forces which meet at one point with lines of action lying on separate planes
 - B. They are the forces which meet at one point and their lines of action also lie on the same plane
 - C. They are the forces which meet at different points with their lines of action lying on the same plane
 - D. None of these

4. Which of the following is the friction that occurs when two objects are moving relative to each other and rub together?
 - A. Kinetic friction
 - B. Static friction
 - C. Internal friction
 - D. None of these

5. Which of the following occurs when surfaces in contact move relative to each other?
 - A. the friction between the two surfaces converts kinetic energy into electrical energy
 - B. the friction between the two surfaces converts kinetic energy into magnetic energy
 - C. the friction between the two surfaces converts kinetic energy into thermal energy
 - D. the friction between the two surfaces converts magnetic energy into electrical energy

6. What is the moment of force?
 - A. moment of force is the sum of a force and its distance from an axis
 - B. moment of force is the product of a force and its distance from an axis
 - C. moment of force is the first derivative of force with respect to its axis
 - D. none of these

7. What is the Otto Cycle efficiency if the compression ratio is 8 and the ratio of the molar specific heats is 1.8?
 - A. 19%
 - B. 81%
 - C. 18%
 - D. None of these

8. What is the name of the force by which a body is attracted towards the earth?
 - A. Center of gravity
 - B. Weight
 - C. Mass
 - D. Energy

9. When a Bofors 40 mm gun is fired, the recoil can be explained by which of the following laws?
 - A. Newton's first law
 - B. Newton's second law
 - C. Newton's third law
 - D. Newton's fourth law

10. Which of the following processes uses heat treatment to alter the physical and sometimes chemical properties of a material to increase its ductility and to make it more workable?
 - A. Smelting
 - B. Annealing
 - C. Forging
 - D. All the above

11. Which of the following gauges is mostly used to measure the clearance between two parts?
 - A. Screw gauge
 - B. Feeler gauge
 - C. Vernier caliper
 - D. All the above

12. Which of the following defines the break even point?
 - A. Where the volume of production is such that there is no loss or no profit
 - B. Where the volume of production reaches 80% of the installed capacity
 - C. Where the volume of production is equal to the installed capacity
 - D. None of these

13. The ratio of load lifted to the effort applied is known as _____
 - A. Lift ratio
 - B. Mechanical advantage
 - C. Lift advantage
 - D. Mechanical ratio

14. Which of the following has a self locking property?
 - A. Nut cracker
 - B. Scissors
 - C. Tongs
 - D. Screw

15. The statement that "the moment of any force is equal to the algebraic sum of the moments of the components of that force" is known as
 - A. Varignon's theorem
 - B. Principle of Moments
 - C. Both A and B
 - D. None of these

16. Which of the following types of energy is possessed by a tightly wound spring?
- A. Kinetic energy
 - B. Magnetic energy
 - C. Strain energy
 - D. Electro-magnetic energy
17. What is one radians equal to?
- A. $90^\circ \pi$
 - B. $180^\circ \pi$
 - C. $360^\circ \pi$
 - D. None of these
18. When is work said to be done?
- A. When a force acts on a body and the body undergoes a displacement
 - B. When a force acts on a body and the body undergoes no displacement
 - C. When there is no force but the body undergoes a displacement
 - D. None of these
19. One Joule is equal to which of the following?
- A. (Newton) . (Meter)
 - B. (Coulomb) . (Volt)
 - C. (Pascal) . (Meter)³
 - D. All the above
20. In a closed system, the total momentum is constant. This statement is known as _____
- A. Law of conservation of momentum
 - B. Law of Closed Momentum
 - C. Law of Constance
 - D. None of these
21. In a bending beam, a point at which no bending occurs or where the bending moment changes its sign from negative to positive or vice versa is known as
- A. point of contraflexure
 - B. point of reversal
 - C. point of zero moment
 - D. none of these
22. Which of the following is a proper statement of Hooke's law?
- A. Within elastic limits, strain produced is inversely proportional to the stress producing it
 - B. Within two end of the beam, strain produced is proportional to the stress producing it
 - C. Within elastic limits, strain produced is proportional to the stress producing it
 - D. Strain produced is proportional to the volume of the object producing it
23. A joint where material is removed from each of the members so that the resulting joint is the thickness of the thickest member is known as _____
- A. Lap joint
 - B. Half lap joint
 - C. Material joint
 - D. Elbow joint

24. The stress at which a material begins to deform plastically is known as ____
- A. Elastic limit
 - B. Deform point
 - C. Irreversible plasticity
 - D. All the above
25. Which of the following is the name given to the axis of the cross-section a beam at which the bending stress is zero?
- A. Bending axis
 - B. Neutral axis
 - C. Null axis
 - D. None of these
26. What is the amount of stress induced in a 5 mm steel bar of length 2 m when heated from 20° C to 140° C while it is free to expand?
- A. 600 Pa
 - B. 1200 Pa
 - C. 48 Pa
 - D. None of these
27. The maximum energy that can be absorbed per unit volume without creating a permanent distortion is called _____
- A. Resilience
 - B. Distortion limit
 - C. Modulus of resilience
 - D. None of these
28. Which of the following describes a single load or force that has a small contact area as to be negligible compared with the entire surface area of the supporting member?
- A. Contact load
 - B. Concentrated load
 - C. Common load
 - D. None of these
29. When a material has uniform properties in all directions or orientations, then it is called _____
- A. Isotope
 - B. Isotropic
 - C. Isothermal
 - D. Isomatic
30. Which of the following is an anisotropic material?
- A. Glass
 - B. Mercury
 - C. Wood
 - D. All the above
31. Which of the following is the ratio of the dynamic viscosity to the density of the fluid?
- A. Modulus of viscosity
 - B. Kinetic viscosity
 - C. Viscoelasticity

- D. None of these
32. The point in a fluid stream where the diameter of the stream is the least, and fluid velocity is at its maximum is known as _____
- A. Squeeze point
 - B. Vena Contracta
 - C. Coefficient of contraction
 - D. None of these
33. In the context of fluid mechanics, the ratio of the loss of head of fluid, issuing from an orifice or passing over a weir, to the remaining head is known as _____
- A. Head ratio
 - B. Coefficient of orifice
 - C. Coefficient of resistance
 - D. None of these
34. If the center of gravity is beneath the center of buoyancy, then the buoyant object will be
- A. Stable
 - B. Unstable
 - C. Whether stable or not depends on the quantity of fluid displaced
 - D. None of these
35. What is the SI unit of measurement of dynamic viscosity?
- A. Kilogram per meter
 - B. Newton-second
 - C. Newton
 - D. Pascal-second
36. What is the SI unit of measurement of specific gravity?
- A. Kilograms
 - B. Meters per second²
 - C. Kilograms per cubic meter
 - D. None of these
37. a pressure surge caused when a valve closes suddenly at an end of a pipeline system, leading to a pressure wave propagating in the pipe is called _____
- A. fluid pressure
 - B. water hammer or fluid hammer
 - C. water wave or fluid wave
 - D. none of these
38. which of the following factors determine the buoyancy?
- A. Weight of floating object
 - B. Weight of the fluid displaced
 - C. Atmospheric pressure
 - D. None of these

39. A container of 5 m^3 contains a particular vegetable oil which weighs 32 kN. What is the specific weight of the oil?
- A. 4.5 kN/m^3
 - B. 6.4 kN/m^3
 - C. 0.15 kN/m^3
 - D. None of these
40. The dual combustion cycle is also known as the _____
- A. Trinkler cycle
 - B. Seiliger cycle
 - C. limited pressure or mixed cycle
 - D. All the above
41. What is the number of valves in a diesel engine?
- A. One
 - B. Two
 - C. Three
 - D. More than three
42. Which of the following is true with respect to Morse test?
- A. It can be done only for multi-cylinder IC engines
 - B. It can be done on both petrol as well as diesel engines
 - C. Both A and B
 - D. None of these
43. What are Swirl flaps?
- A. They are small butterfly valves fitted to the intake manifold just before the cylinder head intake ports of modern automotive diesel engines
 - B. They are small butterfly valves fitted to the intake manifold just before the cylinder head intake ports of modern automotive petrol engines
 - C. They are small fuel injectors fitted to the intake manifold just before the cylinder head intake ports of modern steam engines
 - D. None of these
44. Which of the following is used to give more oxygen in each intake cycle of the engine, letting it burn more fuel and do more work
- A. Additional Oxygen cylinder
 - B. Supercharger
 - C. Extra cam on the intake valve
 - D. None of these
45. What is the octane number of a mixture containing 85% of iso-octane and 15% of normal heptanes?
- A. 15
 - B. 42.5
 - C. 85
 - D. None of these

46. Which of the following statements is true?
- A. In diesel engines, thermal losses are lower in the direct injection as compared to indirect injection
 - B. In diesel engines, thermal losses are higher in the direct injection as compared to indirect injection
 - C. In diesel engines, thermal losses in the direct injection are same as compared to indirect injection
 - D. In diesel engines, thermal losses in the direct injection are either lower or higher as compared to indirect injection depending on the external temperature
47. Which of the following components regulates the idling speed and maximum speed of the engine by controlling the rate of fuel delivery in a diesel engine?
- A. Carburetor
 - B. Inlet valve
 - C. Governor
 - D. None of these
48. Which of the following is the correct formula for Engine Volumetric Efficiency, given that V_a is the volume of air taken in the cylinder and V_c is the maximum possible volume in the cylinder?
- A. V_c / V_a
 - B. V_a / V_c
 - C. $V_c \cdot V_a$
 - D. None of the above
49. What is brake power?
- A. It is the power required to bring the engine to a stop
 - B. It is torque developed when the brake is applied, measured at the brake shoe
 - C. It is the power developed by an engine and measured at the output shaft
 - D. None of these
50. How many stable isotopes does uranium has?
- A. Two
 - B. Eight
 - C. Twenty six
 - D. None of these
51. Which of the following is the indicator of the combustion speed of diesel fuel?
- A. Heptane number
 - B. Cetane number
 - C. Octane number
 - D. All the above
52. Which of the following elements are used in control rods that are used in nuclear reactors to control the fission rate?
- A. Cadmium
 - B. Boron
 - C. Indium
 - D. All the above

53. What is Half-value thickness or Halving thickness
- It is the thickness of the material at which the radiating material is reduced to its half-life.
 - It is the one half of the thickness of the material required to reduce radiation entering it
 - It is the thickness of the material at which the intensity of radiation entering it is reduced by one half
 - None of these
54. Which of the following belong to the Roto-dynamic compressor family?
- Centrifugal compressors
 - Axial flow compressors
 - Both A and B
 - None of these
55. Which of the following is a thermodynamic process where the entropy of the system remains constant throughout?
- Isentropic process
 - Isosceles process
 - Isoclinic process
 - None of these
56. Which of the following cycles is the basis for the working of a closed cycle gas turbine?
- Otto Cycle
 - Joule Cycle
 - Brayton Cycle
 - Both B and C
57. Which of the following is true with respect to the rocket engines?
- They can operate in airless vacuum
 - They have their own captive oxygen supply
 - Both A and B
 - None of these
58. Which of the following denotes the power developed by combustion of fuel in the combustion chamber?
- Brake power
 - Indicated power
 - Operational power
 - None of these
59. What is a double acting compressor?
- It is a compressor where air is compressed on both sides of the piston
 - It is a compressor where air is compressed by two pistons working inside a single cylinder
 - Both A and B
 - None of these
60. In which of the following compressors, the flow of air through the compressor is parallel to its axis?
- Axial flow compressor
 - Centrifugal compressor
 - Both A and B

- D. None of these
61. In some systems, the working fluids sustain the process on a self sustaining basis, once a system has been started by some external power source. What is the name given to such a systems?
- A. Perpetual system
 - B. Bootstrap system
 - C. Continuous system
 - D. None of these
62. What is one ton of refrigeration equal to?
- A. approximately 12,000 BTU/h
 - B. approximately 120 BTU/h
 - C. approximately 12 BTU/h
 - D. none of these
63. what is Stanton number?
- A. It measures the ratio of specific volume of a fluid to the thermal capacity of the fluid
 - B. It measures the ratio of specific gravity of a fluid to the thermal capacity of the fluid
 - C. It measures the ratio of heat specific gravity of a fluid to specific volume of the fluid
 - D. It measures the ratio of heat transferred into a fluid to the thermal capacity of the fluid
64. The ratio of inertia force to viscous force is called _____
- A. Prandtl number
 - B. Grashoff number
 - C. Biot number
 - D. Reynolds number
65. What is the critical temperature and critical pressure of ammonia, respectively?
- A. 132.4 °C and 111.3 atm
 - B. -132.4 °C and 11.13 atm
 - C. 132.4 °C and 11.3 atm
 - D. None of these
66. What is blackbody radiation?
- A. Electrical currents emitted by a black body
 - B. Electromagnetic radiation emitted by a black body
 - C. Electromagnetic radiation emitted by a black hole
 - D. None of these
67. In general, the heat transfer in gases and liquids takes place by
- A. Conduction
 - B. Radiation
 - C. Convection
 - D. All the above
68. A ton of refrigeration is defined as _____.
- A. the heat of fusion absorbed by melting 1 ton of pure ice at 32 °C in 24 hours
 - B. the heat of fusion absorbed by melting 1 ton of pure ice at 0 °C in 1 hour
 - C. the heat of fusion absorbed by melting 1 ton of pure ice at 0 °C in 24 hours

- D. none of these
69. Which of the following are blamed for ozone layer depletion?
- A. Chloro-fluoro-carbon refrigerants
 - B. Hydrofluorocarbons
 - C. Both A and B
 - D. None of these
70. What is Nusselt number?
- A. The ratio of energy transferred by convection to that by radiation
 - B. The ratio of energy transferred by convection to that by conduction
 - C. The ratio of energy transferred by conduction to that by radiation
 - D. All the above
71. Which of the following processes is used to prevent formation of iron oxide by applying a protective zinc coating to iron?
- A. Galvanizing
 - B. Oxidizing
 - C. Anti-oxidizing
 - D. None of these
72. Which of the following is the heat treatment process in which iron or steel absorbs carbon liberated when the metal is heated in the presence of a carbon bearing material, in order to make the metal harder?
- A. Carbonization
 - B. Carbonation
 - C. Carburizing
 - D. Carburation
73. The neutral flame is created by supplying the flame with the amount of oxygen which is _____
- A. precisely enough for reduction but no oxidation occurs
 - B. precisely enough for equal amounts of oxidation and reduction occurs
 - C. precisely enough for oxidation but no reduction occurs
 - D. precisely enough for burning, and neither oxidation nor reduction occurs
74. The process where there is no reduction of material, only a modification in its geometry, is called _____
- A. Lancing
 - B. Machining
 - C. Notching
 - D. None of these
75. Which of the following operations involves straightening a curved sheet metal?
- A. Notching
 - B. Planishing
 - C. Straightening
 - D. Deforming

76. Which of the following is used for checking the external diameter of a cylindrical object?
- A. Tape
 - B. Ring gauge
 - C. Screw gauge
 - D. Scale
77. What is the rolling resistance to the truck whose weight is 72,000 N and its co-efficient of rolling resistance is 0.019?
- A. 7200 N
 - B. 1900 N
 - C. 1368 N
 - D. None of these
78. The electronic device that measures the proportion of oxygen (O₂) in the gas or liquid is called _____
- A. Oxygen meter
 - B. Oxygen sensor
 - C. Oxyliizer
 - D. None of these
79. To which of the following categories does a petrol engine belong?
- A. Compression engines
 - B. Spark ignition engine
 - C. Both A and B
 - D. None of these
80. Which of the following is considered as a supplementary restraint system?
- A. Self locking brakes
 - B. Air bags
 - C. Skid proof tires
 - D. None of these
81. Which of the following connects the steering rack to the knuckles in an automobile?
- A. Spindle
 - B. Tie rod
 - C. Differential
 - D. None of these
82. Which of the following type of joints The ball joints are used on the tie-rod ends, because they can deal with movement of suspension not only vertically but also in other direction?
- A. T-joints
 - B. Ball joints
 - C. Straight joints
 - D. None of these
83. The braking system that maintains directional control during braking is called _____
- A. Self locking braking system
 - B. Skid locking braking system
 - C. Anti locking braking system
 - D. None of these

84. Worm gear is an example of which of the following simple machines?
- A. Lever
 - B. Screw
 - C. Wedge
 - D. Pulley
85. What is the name given to the crescent-shaped cavity on the top surface of the piston head?
- A. Valve recess
 - B. Crescent hole
 - C. Valve cup
 - D. None of these
86. Which of the following is true with a V6 engine?
- A. It is more compact than the inline 4 and more compact than the V8 engine
 - B. It is widely used as a transverse engine with front-wheel drive layout
 - C. It has two banks of three cylinders each, set at either a 60 or 90 degree angle to each other
 - D. All the above
87. Which of the following types of brakes is commonly used in railroad trains and trailers?
- A. Pneumatic brakes
 - B. Hydraulic brakes
 - C. Both A and B
 - D. None of these
88. What is the octane number of compressed gas?
- A. 80
 - B. 120
 - C. 180
 - D. None of these
89. What is the "aspect ratio" of a tire?
- A. It is the sidewall height as a percentage of the inner diameter of the tire
 - B. It is the sidewall height as a percentage of the radius of the tire
 - C. It is the sidewall height as a percentage of the total width of the tire
 - D. None of these
90. When the leading edges of the teeth are not parallel to the axis of rotation, but are set at an angle so that can be meshed in parallel or crossed orientations, they are called _____
- A. Helical gears
 - B. Spur gears
 - C. Worm gears
 - D. None of these
91. The friction experienced by a body when it is in motion is called _____
- A. Body friction
 - B. Dynamic friction
 - C. Angular friction
 - D. None of these

92. What is the coefficient of restitution of a perfect elastic body?
- A. 0.0
 - B. Less than 0.5
 - C. Between 0.50 and 0.75
 - D. 1.0
93. Which of the following statements is true?
- A. Dynamic friction is always less than static friction
 - B. Dynamic friction is always greater than static friction
 - C. Dynamic friction is always same as static friction
 - D. Dynamic friction is double the static friction
94. One Joule per second is equal to
- A. 1 Watt
 - B. 1 kilo Watt
 - C. 1 Pascal
 - D. None of these
95. The motion of an artificial satellite orbiting the Earth at constant height is an example of
- A. Linear motion
 - B. Space motion
 - C. Circular motion
 - D. Superficial motion
96. What is the weight of a woman standing inside a lift which is moving down with an acceleration of 9.8 m/s^2 ?
- A. Half of her original weight
 - B. Zero
 - C. One-tenth of her original weight
 - D. None of these
97. The force which acts along the radius of a circle and directed towards its centre is known as _____
- A. Centrifugal force
 - B. Radial force
 - C. Centripetal force
 - D. None of these
98. The quantum of force that produces an acceleration of 1 m/s^2 on a mass of one kg, in the direction of which it acts is equal to
- A. One Watt
 - B. One Newton
 - C. One Joule
 - D. None of these
99. Which of the following types of energy is possessed by a tightly wound watch spring?
- A. Radial energy
 - B. Kinetic energy
 - C. Strain energy
 - D. Circular energy

100. The total energy possessed by a system of moving bodies is _____
- A. Varies according to the direction of movement
 - B. Constant at any point in time
 - C. Hyperbolically decreasing over time
 - D. None of these