1. The property of fluid, which determines its resistance to shearing stress, is called

   (A) Viscosity

   (B) Surface tension

   (C) Compressibility

   (D) Density

2. The printer's ink is an example of

   (A) Newtonian fluid

   (B) Non-Newtonian fluid

   (C) Thyxotropic substance

   (D) Elastic solid

3. Elasticity of fluids is measured in terms of

   (A) Young's modulus of elasticity

   (B) Shear modulus of elasticity

   (C) Bulk modulus of elasticity

   (D) None of the above

4. Which of the following is a mechanical gauge?

   (A) Diaphragm gauge

   (B) Dead weight pressure gauge

   (C) Bourdon tube pressure gauge

   (D) All of the above

5. A fluid is a substance that

   (A) Always expand until it fills any container

   (B) Is practically incompressible

   (C) Cannot remain at rest under action of any shear force

(D) Cannot be subjected to shear forces

6. Surface tension has the dimensions.
   (A) F
   (B) FL^{-1}
   (C) FL^{-2}
   (D) FL^{-3}

7. Falling drop of rain acquire spherical shape on account of
   (A) Viscosity
   (B) Surface tension
   (C) Vapour pressure
   (D) Compressibility

8. Select the correct statement
   (A) Absolute pressure = Gage pressure – Atmosphere pressure
   (B) Gage pressure = Absolute pressure – Atmosphere pressure
   (C) Absolute pressure = Atmosphere pressure + Vacuum pressure
   (D) Gage pressure = Atmosphere pressure + Vacuum pressure

9. Buoyant force is
   (A) The resultant force on a body due to the fluid surrounding it
   (B) The resultant force acting on a floating body
   (C) Equal to the volume of liquid displaced
   (D) The force necessary to maintain equilibrium of a submerged body

10. A small plastic boat loaded with nuts and bolts is floating in a bathtub. If the cargo is dumped into the water, allowing the boat to float empty, then the water level in the tub will
   (A) Rise
   (B) Fall
   (C) Not change
   (D) None of the above

11. The line of action of the buoyant force acts through the
   (A) Centre of the gravity of any submerged body
   (B) Centroid of the volume of any floating body

(C) Centroid of the displaced volume of fluid

(D) Centroid of the horizontal projection of the body

12. A control volume refers to

(A) A fixed region in space

(B) A specified mass

(C) A closed system

(D) A reversible process only

13. Continuity equation

(A) Express the relation between energy and work

(B) Relates the momentum per unit volume for two points on a stream line

(C) Relates mass rate of flow along a stream tube

(D) Constant discharge through a long, straight tapering pipe

14. One dimensional flow is

(A) Steady uniform flow

(B) Uniform flow

(C) Flow, which neglects changes in a transverse direction

(D) Restricted to flow in a straight line

15. For steady rotational flow of a fluid, Bernoulli's equation

(A) Cannot be derived

(B) Can be derived for the entire flow field

(C) Can be derived for the points lying on the same stream line

(D) Can be derived only if the fluid is incompressible

16. Navier-Stokes equation is useful in the analysis of

(A) Non-viscous flow

(B) Turbulent flow

(C) Viscous flow

(D) Both, Viscous and Turbulent flow

17. Euler's equation of motion can be integrated when it is assumed that

(A) The continuity equation is satisfied

(B) The fluid is incompressible

(C) A velocity potential exists and the density is constant

(D) The flow is rotational and incompressible

18. An equipotential line

(A) Has no velocity component tangent to fit

(B) Is same as stream line

(C) Has constant dynamic pressure

(D) Has no velocity component normal to it

19. The head loss in turbulent flow in pipe

(A) Varies directly as the velocity

(B) Varies inversely as the square of the velocity

(C) Varies inversely as the square of the diameter

(D) Varies approximately as the square of the velocity

20. In Laminar flow through a pipe discharge varies

(A) Linearly as the viscosity

(B) As the square of radius

(C) Inversely as the pressure drop

(D) Inversely as the viscosity

21. Reynolds number may be defined as the ratio of

(A) Viscous forces to inertial forces

(B) Elastic forces to pressure forces

(C) Inertial forces to viscous forces

(D) Gravity forces to inertial forces

22. Mach number is ratio of inertia forces to

(A) Pressure forces

(B) Elastics forces

(C) Surface tension forces

(D) Gravity forces

23. The first law of thermodynamics defines a property called

(A) Entropy

(B) Pressure

(C) Energy

(D) Volume

24. Which of the following is not a property of a system?

(A) Pressure

(B) Temperature

(C) Work Transfer

(D) Entropy

25. The internal energy of an ideal gas is

(A) A function of its temperature alone

(B) A function of its pressure alone

(C) A function of its volume alone

(D) A function of its pressure and volume alone

26. Which of the following represents a closed system?

(A) Bomb calorimeter

(B) Steam generator

(C) Universe

(D) Exhaust stroke of an IC engine

27. All of the following are intensive properties of a system, except

(A) Viscosity

(B) Temperature

(C) Density

(D) Potential energy

28. Identify the wrong statement

(A) The laws of thermodynamics cannot be derived mathematically

(B) The quantity of matter constituting a system remains constant

(C) The kinetic and potential energies possessed by a system can be converted into heat

(D) The system and it surroundings taken together constitute an isolated system

29. Zeroth law of thermodynamics forms the basis of ————— measurement.

(A) Pressure

(B) Temperature

(C) Heat exchange

(D) Work

30. As differentials, heat and work would be described mathematically as

(A) Inexact
(B) Exact
(C) Discontinuity
(D) Point function

31. Air is being forced by the bicycle pump into a tyre against a pressure of 4.5 bar. A slow downward moment of the piston can be approximated as
(A) Isobaric process
(B) Adiabatic process
(C) Isothermal process
(D) Throttling process

32. Work output from a system is at the expense of internal energy in a non-flow process carried out
(A) At constant pressure
(B) At constant volume
(C) Adiabatically
(D) Polytropically

33. Which is the essence of the second law of thermodynamics?
(A) The whole of heat supplied to system can be converted into equivalent mechanical work
(B) No engine can be 100% efficient
(C) A refrigerator can reduce the temperature to absolute zero
(D) Reversible engines working between the same temperature limits can have different thermal efficiencies

34. In a Carnot cycle, the rejection of heat is
(A) At constant pressure
(B) At constant volume
(C) At constant temperature
(D) Partly at constant pressure and partly at constant volume

35. The efficiency of a Carnot cycle engine depends on
    (A) Speed of the engine
    (B) Working fluid; whether gas or vapour
    (C) Temperature at which heat is supplied and that at which it is rejected
    (D) Temperature of ambient air

36. No heat engine can operate by exchanging heat with a single temperature sources. This statement refers to the
    (A) Joule's law
    (B) Carnot theorem
    (C) Clausius statement
    (D) Kelvin Planck statement

37. The entropy of the universe tends to
    (A) Become zero
    (B) Remain constant
    (C) Be maximum
    (D) Attain a certain finite minimum value

38. For any natural process, the entropy change would be
    (A) Zero
    (B) Positive
    (C) Negative
    (D) Unpredictable

39. Which of the following is the correct statement?
    (A) A reversible adiabatic process is an isentropic process
    (B) An irreversible adiabatic process is a constant entropy process
    (C) Entropy decreases during an irreversible adiabatic process
    (D) An isentropic process is an adiabatic process

40. Which of the following cycles is often referred to as limited pressure cycle?
    (A) Dual cycle
    (B) Ericsson cycle
    (C) Lenoir cycle
    (D) Joule cycle

41. For the same compression ratio and heat supplied, the air standard efficiency of an Otto cycle compared to that of a diesel cycle is
    (A) Less
    (B) More
    (C) Equal
    (D) Unpredictable
42. For the same compression ratio and heat input, the cycles in decreasing order of thermal efficiency are
    (A) Otto, Dual, Diesel
    (B) Diesel, Otto, Dual
    (C) Dual, Diesel, Otto
    (D) Otto, Diesel, Dual

43. Which air standard cycle consists of two isothermal connected by two constant volume processes?
    (A) Brayton cycle
    (B) Erisson cycle
    (C) Stirling cycle
    (D) Atkinson cycle

44. The mean effective pressure of an Otto cycle is
    (A) Independent of pressure ratio
    (B) Directly proportional to pressure ratio
    (C) Inversely proportional to pressure ratio
    (D) Proportional to the square root of the pressure ratio

45. Molar volume is equal to ————— at normal temperature and pressure.
    (A) 29.27 m^3
    (B) 22.4 m^3
    (C) 42.7 m^3
    (D) 84.8 m^3

46. The ideal gas laws can be applied with least error, to
    (A) Boiling water
    (B) Wet steam

(C) Dry saturated steam

(D) Superheated steam

47. Heat transfer takes place according to ———— law of thermodynamics

(A) Zeroth

(B) First

(C) Second

(D) Third

48. Heat transmission is directly linked with the transport of medium itself, i.e. there is actual motion of heated particles during

(A) Conduction only

(B) Convection only

(C) Radiation only

(D) Conduction as well as radiation

49. All the three modes of heat transmission are involved in

(A) Melting of ice

(B) Cooling of a small metal casting in a quenching bath

(C) Heat flow through the walls of a refrigerator

(D) Automobile engine equipped with a thermos-syphon cooling system

50. Which of the following forms of water have the highest value of thermal conductivity?

(A) Boiling water

(B) Steam

(C) Solid ice

(D) Melting ice

51. Heat transfer by radiation is encountered least in

(A) Boiler furnace

(B) Insulated steam pipe

(C) Electric bulb

(D) Nuclear reactor

52. A perfectly black body

(A) Absorbs all the incident radiation

(B) Allows all the incident radiation to pass through it

(C) Reflects all the incident radiation

(D) Has its surface coated with lamp black or graphite

53. The roof of a house has been given a coating of shining metallic paint. Consequently, the temperature inside the room will

(A) Fall

(B) Rise

(C) Remain unaffected

(D) Cannot be decided as it depends on factors other than the type of paint

54. The Prandtl number will be lowest for

(A) Water

(B) Liquid metal

(C) Aqueous solution

(D) Lube oil

55. The ratio of heat transfer by convention to that by conduction is called

(A) Stanton number

(B) Nusselt number

(C) Biot number

(D) Peclet number

56. The ratio of kinematic viscosity to thermal diffusivity is known as

(A) Stanton number

(B) Nusselt number

(C) Prandtl number

(D) Peclet number

57. The steam condenser in a thermal power plant is a heat exchanger of the type

(A) Direct contact

(B) Regenerator

(C) Recuperator

(D) None of these

58. The normal automobile radiator is a heat exchanger of the type

(A) Direct contact

(B) Parallel flow

(C) Counter flow

(D) Cross flow

59. The requirement of transfer of a large heat is usually met by

(A) Increasing the length of tube
(B) Decreasing the diameter of tube
(C) Increasing the number of tube
(D) Having multiple tube or shell passes

60. Multipass heat exchangers are used to
(A) Reduce the pressure drop
(B) Get a compact unit
(C) Obtain high heat transfer coefficient
(D) Facilitate very large temperature drop through the tube wall

61. Piston Rings are usually made of
(A) Aluminium
(B) Cast Iron
(C) Carbon Steel
(D) Bronze

62. In a four stroke IC engine cam shaft rotates at
(A) Same speed as crankshaft
(B) Twice the speed of crankshaft
(C) Half the speed of crankshaft
(D) None of the above

63. Gudgeon pin forms the link between
(A) Piston and big end of the connecting rod
(B) Connecting rod and crank
(C) Piston and small end of the connecting rod
(D) Big end and small end

64. An engine has four cylinders of 68 mm bore and 75 mm stroke. The cubic capacity of engine is
(A) 1089.5 cm^3
(B) 1289.5 cm^3

(C) 1489.5 cm^3

(D) 1689.5 cm^3

65. A certain engine produces 10 kW indicated power & mechanical efficiency is 80%. The friction power is

(A) 12 kW

(B) 8 kW

(C) 4 kW

(D) 2 kW

66. Fuel consumption of an engine is 0.35 kg/kWh and heating value of fuel is 43000 kJ/kg. The brake thermal efficiency is

(A) 20.1%

(B) 23.9%

(C) 28.29%

(D) 32.21%

67. The relative efficiency of an engine will be equal to ————— if air standard efficiency and brake thermal efficiency of engine are 53.4% and 24.4% respectively.

(A) 40.7%

(B) 45.7%

(C) 13.1%

(D) 53.4%

68. Which of the following engines can be categorized as the IC engine?

(A) Steam turbine

(B) Stirling engine

(C) Gas turbine (open cycle)

(D) Gas turbine (closed cycle)

69. Rise in the compression ratio in petrol engine the knocking tendency

(A) Increases

(B) Decreases

(C) Not Affected

(D) None of the above

70. ————— indicates the breathing ability of an IC engine.
    (A) Relative Efficiency
    (B) Mechanical Efficiency
    (C) Volumetric Efficiency
    (D) Brake Thermal Efficiency

71. Cetane number of any fuel indicates the following property of any fuel
    (A) Ignition quality
    (B) Calorific Value
    (C) Mixing Ability
    (D) Density

72. The antiknock quality of the fuel is indicated by
    (A) Cetane Number
    (B) Octane Number
    (C) Volatility
    (D) Calorific Value

73. The higher the self-ignition temperature of the fuel, ————— the ignition lag.
    (A) Shorter
    (B) Longer
    (C) No Effect
    (D) Moderate

74. The Willian's Line method is used to calculate
    (A) Friction power
    (B) Brake power
    (C) Indicated power
    (D) All of the above

75. The formation of CO is more when the equivalence ratio (Φ) is
    (A) $\Phi > 1$
    (B) $\Phi < 1$
    (C) $\Phi = 1$
    (D) Does not depend on Φ

76. The formation of NO_x emission depends upon
    (A) In-cylinder temperature
    (B) Adiabatic flame temperature
    (C) Availability of oxygen

(D) All of the above

77. Following type of emissions are more when alcohol fuels are used
    (A) Carbon monoxide emission
    (B) Hydro carbon emission
    (C) Aldehyde
    (D) Smoke

78. The capacity of a refrigerating machine is expressed as
    (A) Lowest temperature attainable
    (B) Rate of abstraction of heat from the space being cooled
    (C) Inside volume of the cabinet
    (D) Gross weight of the machine in tons

79. A Bell-Coleman cycle is a reversed
    (A) Brayton cycle
    (B) Rankine cycle
    (C) Atkinson cycle
    (D) Ericsson cycle

80. Which part of the vapour compression refrigeration cycle produces the refrigeration effect?
    (A) Condenser
    (B) Throttle valve
    (C) Evaporator
    (D) Compressor

81. The refreigerant commonly used for commercial ice plants is
    (A) Freon-12
    (B) NH_3
    (C) CO_2
    (D) SO_2

82. The refrigerant obtained by mixing two refrigerant in proper proportion is called
    (A) Secondary refrigerant
    (B) Auxilliary refrigerant
    (C) Synthetic refrigerant
    (D) Azetrope

83. On a psychrometric chart, the constant wet bulb temperature lines coincide with lines of constant
    (A) Relative humidity
    (B) Enthalpy

(C) Volume

(D) Dew point temperature

84. In sensible heating or cooling process ———— remains constant.

(A) Dry bulb temperature

(B) Wet bulb temperature

(C) Humidity ratio

(D) Relative humidity

85. Identify the process, which is generally practiced in winter air conditioning

(A) Sensible heating

(B) Chemical dehumidification

(C) Humidification

(D) Heating with humidification

86. A Carnot heat pump works between temperature limits of 227°C and 27°C. Its COP is

(A) 1.108

(B) 1.2

(C) 2.2

(D) 9.26

87. In an aircraft refrigeration system, the pressure at the cooling turbine outlet is equal to

(A) Ambient pressure

(B) Cabin pressure

(C) Compressor inlet pressure

(D) Evaporator pressure

88. Waste heat can be effectively used in which one of the following refrigeration system?

(A) Vapour compression cycle

(B) Vapour absorption cycle

(C) Air refrigeration cycle

(D) Vortex refrigeration system

89. When the discharge pressure is too high in refrigeration system, high-pressure control is installed to

(A) Stop the cooling fan

(B) Stop the water circulation pump

(C) Regulate the flow of cooling water

(D) Stop the compressor

90. In adomestic refrigerator periodic defrosting is required because frosting
    (A) Causes corrosion of material
    (B) Reduces heat extraction
    (C) Overcools food stuff
    (D) Partially blocks refrigerant flow

91. Euler's turbine equation is derived with the help of
    (A) Steady flow energy equation
    (B) Newton's second law of motion
    (C) Third law of thermodynamics
    (D) Continuity equation

92. Which of the following is NOT a type of positive displacement pumps?
    (A) Reciprocating pump
    (B) Rotary gear pump
    (C) Centrifugal pump
    (D) None of the above

93. Which of the following types of impeller is used for centrifugal pumps dealing with muds?
    (A) One-side shrouded
    (B) Two-side shrouded
    (C) Double
    (D) Open

94. De-Laval turbines are mostly used where
    (A) Where low speeds are required
    (B) For small power purposes and low speeds
    (C) For small power purposes and high speeds
    (D) For large power purposes

95. The action of steam in a steam turbine is
    (A) Static
    (B) Dynamic
    (C) Static and dynamic
    (D) Neither static nor dynamic

96. In an impulse turbine

(A) The steam is expanded in nozzles only and there is a pressure drop and heat drop
(B) The steam is expanded both in fixed and moving blades continuously
(C) The steam is expanded in moving blades only
(D) The pressure and temperature of steam remains constant

97. Following is true for rotodynamic pump. The increase in energy level occurs due to
(A) Centrifugal energy only
(B) Pressure energy only
(C) Kinetic energy only
(D) All kind of energy mentioned

98. It is called similar hydraulic turbine when they are geometrically similar and have
(A) The same specific speed
(B) The same rotational speed
(C) The same Froude numbers
(D) The same Thoma's number

99. The chances of cavitation increase in turbomachines if
(A) Velocity attains a high value
(B) Temperature rises above a critical value
(C) Pressure falls below the vapour pressure
(D) Thomas cavitation parameter exceeds a certain limit

100. Governing of turbines means
(A) The speed is kept constant under all conditions (loads)
(B) The discharge is kept constant under all conditions
(C) Allow the turbine to run at 'runaway' speed
(D) The power developed is kept constant under all conditions

101. The use of draft tube in a reaction turbine helps to
(A) Reconvert residual kinetic energy to pressure energy
(B) Provide safety to turbine
(C) Increase the flow rate
(D) Transport water to downstream without eddies

102. Which of the following pumps is preferred for flood control and irrigation applications?
(A) Axial flow pump
(B) Centrifugal pump

(C) Mixed flow pump

(D) Reciprocating pump

103. A fast centrifugal pump impeller will have

(A) Backward facing blades

(B) Radial blades

(C) Forward facing blades

(D) Propeller type blades

104. Which of the following is water tube boiler?

(A) Lancashire boiler

(B) Cochran boiler

(C) Locomotive boiler

(D) Babcock and Wilcox boiler

105. Which device is used to heat feed water by utilising the heat available in hot flue gases before leaving through the chimney?

(A) Economiser

(B) Superheater

(C) Blow off cock

(D) Stop valve

106. Which device is used to put off fire in the furnace of the boiler when the level of water in the boiler falls to an unsafe limit?

(A) Fusible plug

(B) Superheater

(C) Blow off cock

(D) Stop valve

107. Steam turbine is ———— combustion thermal prime mover.

(A) External

(B) Internal

(C) Both internal and external

(D) None of the above

108. In a vapour compression system, the lowest temperature during the cycle occurs after

(A) Evaporation

(B) Compression

(C) Condensation

(D) Expansion

109. Heat is rejected by refrigerant in a

(A) Condenser

(B) Compressor

(C) Evaporator

(D) Expansion valve

110. Flash point of fuel oil is

(A) Minimum temperature to which oil is heated in order to give off inflammable vapours in sufficient quantity to ignite momentarily when brought in contact with a flame.

(B) Temperature at which it solidifies or congeals.

(C) Temperature at which it catches fire without external aid.

(D) Indicated by 90% distillation temperature, i.e., when 90% of sample oil has distilled off

111. The humidity ratio or specific humidity is the mass of water vapour present in

(A) 1 m^3 of wet air

(B) 1 m^3 of dry air

(C) 1 kg of wet air

(D) 1 kg of dry air

112. During adiabatic saturation process on unsaturated air ———— remains constant.

(A) Relative humidity

(B) Dew point temperature

(C) Dry bulb temperature

(D) Wet bulb temperature

113. An ideal gas as compared to a real gas at very high pressure occupies.

(A) More volume

(B) Less volume

(C) Same volume

(D) Unpredictable behaviour

114. According to Dalton's law, the total pressure of the mixture of gases is equal to

(A) Sum of the partial pressures of all

(B) Greater of the partial pressures of all

(C) Average of the partial pressures of all

(D) Sum of the partial pressures of all divided by average molecular weight

115. Carnot cycle consists of ————————

(A) Two isothermal and two reversible adiabatic processes

(B) Two constant volume and two reversible adiabatic processes

(C) Two constant pressure and two reversible adiabatic processes

(D) One constant volume, one constant pressure and two reversible adiabatic processes

116. Which process is responsible for the production of energy in the sun?

(A) Nuclear fission reaction

(B) Nuclear fusion reaction

(C) Exothermal chemical reaction

(D) All of the above

117. The value of concentration ratio of flat plat collector is:

(A) 1

(B) 10

(C) 100

(D) 1000

118. The payback period of an ordinary passive solar water heater is:

(A) 20-60 years

(B) 1 year

(C) 2-6 years

(D) 6-10 years

119. The value of heat removal factor F_R of a flat plate collector lies in range:

(A) 0 to 0.1

(B) 0 to 1

(C) 0.9 to 0.95

(D) 0.5 to 0.6

120. The efficiency of a commercial solar cell lies in range:

(A) 0-10%

(B) 10-20%

(C) 20-30%

(D) 50-60%

121. During inelastic collision of two particles, which one of the following is conserved?

(A) Total linear momentum only

(B) Total kinetic energy only

(C) Both linear momentum and kinetic energy

(D) Neither linear momentum nor kinetic energy

122. The coefficient of restitution of a perfectly plastic impact is

(A) 0

(B) 1

(C) 2

(D) ∞

123. The angle of inclination of the plane, at which the body begins to move down the plane, is called

(A) Angle of friction

(B) Angle of response

(C) Angle of projection

(D) Helix angle

124. For a simply supported beam on two end supports the bending moment is maximum

(A) Usually on the supports

(B) Always at mid span

(C) Where there is no shear force

(D) Where the deflection is maximum

125. A simply supported laterally loaded beam was found to deflect more than a specified value. Which of the following measures will reduce deflection?

(A) Increase the area moment of inertia

(B) Increase the span of the beam

(C) Select different material having lesser modulus of elasticity

(D) Magnitude of the load to be increased

126. The coordination number of FCC crystal structure is
(A) 4
(B) 8
(C) 12
(D) 16

127. Atomic packing factor (APF) in the case of copper crystal is
(A) 0.52
(B) 0.68
(C) 0.74
(D) 1.633

128. Which one of the following crystal systems is valid for gold?
(A) Orthogonal
(B) Cubic
(C) Hexagonal
(D) Triclinic

129. The percentage of carbon in grey cast iron is in the range of
(A) 0.25% to 0.75%
(B) 1.25% to 1.75%
(C) 3% to 4%
(D) 8% to 10%

130. An allotropic material has
(A) Fixed structure at all temperatures
(B) Atoms distributed in random pattern
(C) Different crystal structures at different temperature
(D) Fixed structure but random atom distribution

131. Edge dislocation is a
(A) Point imperfection
(B) Line imperfection
(C) Surface imperfection
(D) Volume imperfection

132. Addition of magnesium to cast iron increases its
(A) Hardness

(B) Ductility and strength in tension
(C) Corrosion resistance
(D) Creep strength

133. Eutectoid reaction occurs at
(A) 600°C
(B) 723°C
(C) 114°C
(D) 1493°C

134. Increase of ferrite phase in steel increases
(A) Strength
(B) Hardness
(C) Ductility
(D) Brittleness

135. According to Gibbs' phase rule, the number of degrees of freedom of a eutectic point in a binary system is
(A) 1
(B) 2
(C) 0
(D) 3

136. In a reciprocating steam engine, which of the following forms a kinematic link?
(A) Cylinder and piston
(B) Piston rod and connecting rod
(C) Crank shaft and flywheel
(D) Flywheel and engine frame

137. The lead screw of a lathe with nut forms a
(A) Sliding pair
(B) Rolling pair
(C) Screw pair
(D) Turning pair

138. The mechanism forms a structure, when the number of degrees of freedom (n) is equal to
(A) 0
(B) 1
(C) 2
(D) –1

139. Which of the following is an inversion of single slider crank chain?

(A) Beam engine
(B) Watt's indicator mechanism
(C) Elliptical trammels
(D) Oscillating cylinder engine

140. The component of the acceleration, parallel to the velocity of the particle, at the given instant is called
(A) Radial component
(B) Tangential component
(C) Coriolis component
(D) None of these

141. The coriolis component of acceleration is taken into account for
(A) Slider crank mechanism
(B) Four bar chain mechanism
(C) Quick return motion mechanism
(D) None of these

142. The product of the diametral pitch and circular pitch is equal to
(A) 1
(B) $1/\pi$
(C) π
(D) 2π

143. The size of the gear is usually specified by
(A) Pressure angle
(B) Circular pitch
(C) Diametral pitch
(D) Pitch circle diameter

144. The contact ratio for gear is
(A) 0
(B) 1
(C) Less than one
(D) Greater than one

145. A differential gear in an automobile is a
(A) Simple gear train
(B) Compound gear train
(C) Reverted gear train
(D) Epicyclic gear train

146. In a clock mechanism, the gear train used to connect minute hand to hour hand, is
   (A) Epicyclic gear train
   (B) Reverted gear train
   (C) Compound gear train
   (D) Simple gear grain

147. The maximum fluctuation of energy is the
   (A) Sum of the maximum and minimum energies
   (B) Difference between the maximum and minimum energies
   (C) Ratio of the maximum energy and minimum energy
   (D) Ratio of the mean resisting torque to the work done per cycle

148. When the pitching of a ship is upward, the effect of gyroscopic couple acting on it will be
   (A) To move the ship towards port side
   (B) To move the ship towards star-board
   (C) To raise the bow and lower the stern
   (D) To raise the stern and lower the bow

149. In an automobile, if the vehicle makes a left turn, the gyroscopic torque
   (A) Increases the forces on the outer wheels
   (B) Decreases the forces on the outer wheels
   (C) Does not affect the forces on the outer wheels
   (D) None of these

150. The size of the cam depends upon
   (A) Base circle
   (B) Pitch circle
   (C) Prime circle
   (D) Pitch curve

151. The cam follower generally used in automobile engines is
   (A) Knife edge follower
   (B) Flat faced follower
   (C) Spherical faced follower
   (D) Roller follower

152. The primary unbalanced force is maximum when the angle of inclination of the crank with the line of stroke is

(A) 0°
(B) 90°
(C) 180°
(D) 360°

153. In a locomotive, the maximum magnitude of the unbalanced force along the perpendicular to the line of stroke, is known as
(A) Tractive force
(B) Swaying couple
(C) Hammer blow
(D) None of these

154. The ratio of the maximum displacement of the forced vibration to the deflection due to the static force, is known as
(A) Damping factor
(B) Damping coefficient
(C) Logarithmic decrement
(D) Magnification factor

155. The factor, which affects the critical speed of the shaft, is
(A) Diameter of the disc
(B) Span of the shaft
(C) Eccentricity
(D) All of these

156. A rivet is specified by
(A) Shank diameter
(B) Length of rivet
(C) Type of head
(D) Length of tail

157. The centre to centre distance between two consecutive rivets in a row, is called
(A) Margin
(B) Pitch
(C) Back pitch
(D) Diagonal pitch

158. The parallel fillet welded joint is designed for
(A) Tensile strength
(B) Compressive strength

(C) Bending strength
(D) Shear strength

159. The maximum shear stress theory is used for
(A) Brittle material
(B) Ductile materials
(C) Plastic materials
(D) Non-ferrous material

160. The design of shafts made of brittle material is based on
(A) Guest's theory
(B) Rankine's theory
(C) St. Venant's theory
(D) Von Mises theory

161. Two shafts will have equal strength, if
(A) Diameter of both the shafts is same
(B) Angle of twist of both the shafts is same
(C) Material of both the shafts is same
(D) Twisting moment of both the shafts is same

162. The cone clutches have become obsolete because of
(A) Small cone angle
(B) Exposure to dirt and dust
(C) Difficult in disengaging
(D) All of these

163. A brake commonly used in railway trains is
(A) Shoe brake
(B) Band brake
(C) Band and block brake
(D) Internal expanding brake

164. A brake commonly used in motor cars is
(A) Shoe brake
(B) Band brake
(C) Band and block brake
(D) Internal expanding brake

165. A sliding bearing, which can support steadily loads without any relative motion between the

journal and the bearing, is called

(A) Zero film bearing

(B) Boundary lubricated bearing

(C) Hydrodynamic lubricated bearing

(D) Hydrostatic lubricating bearing

166. In thrust bearings, the load acts

(A) Along the axis of rotation

(B) Parallel to the axis of rotation

(C) Perpendicular to the axis of rotation

(D) In any direction

167. The rolling contact bearings are known as

(A) Thick lubricated bearings

(B) Plastic bearings

(C) Thin lubricated bearings

(D) Antifriction bearings

168. The ball bearings are usually made from

(A) Low carbon steel

(B) Medium carbon steel

(C) High carbon steel

(D) Chrome nickel steel

169. Mixture of ice and water form a

(A) Closed system

(B) Open system

(C) Isolated system

(D) Heterogeneous system

170. Lewis equation in spur gears is applied

(A) Only to the pinion

(B) Only to the gear

(C) To stronger of the pinion or gear

(D) To weaker of the pinion or gear

171. Increase in carbon content in plain carbon steels raises its
    (A) Ductility
    (B) Tensile strength and malleability
    (C) Tensile strength and hardness
    (D) Ductility and melting temperature

172. Hardness of steel greatly improves with
    (A) Annealing
    (B) Cyaniding
    (C) Normalising
    (D) Tempering

173. Chills are used in moulds to
    (A) Achieve directional solidification
    (B) Reduce possibility of blow holes
    (C) Reduce the freezing time
    (D) Smoothen the metal for reducing spatter

174. Disposable patterns are made of
    (A) Wood
    (B) Rubber
    (C) Metal
    (D) Polystyrene

175. Light impurities in the molten metal are prevented from reaching the mould cavity by providing
    (A) Strainer
    (B) Bottom well
    (C) Skim bob
    (D) All of the above

176. In oxyacetylene gas welding, temperature at the inner cone of the flame is around
    (A) 3500°C
    (B) 3200°C
    (C) 2900°C

(D) 2550°C

177. Which one of the following is a solid-state joining process?

(A) Gas tungsten arc welding

(B) Resistance spot welding

(C) Friction welding

(D) Submerged arc welding

178. In turning operation the surface finish can be improved by decreasing

(A) Cutting speed

(B) Feed per revolution

(C) Rake angle

(D) Nose radius

179. Among the conventional machining processes, maximum specific energy is consumed in

(A) Turning

(B) Drilling

(C) Planning

(D) Grinding

180. Cutting speed in grinding is set to a high value to

(A) Reduce the cutting time

(B) Increase the bond strength

(C) Improve cooling of job and wheel

(D) Reduce the wheel wear

181. In PERT analysis a critical activity has

(A) Maximum float

(B) Zero float

(C) Maximum cost

(D) Minimum cost

182. Production flow analysis is a method of identifying part families that uses data from

(A) Engineering drawing

(B) Production schedule

(C) Bill of material

(D) Route sheets

183. Vehicle manufacturing assembly line is an example of

(A) Production layout

(B) Process layout

(C) Manual layout

(D) Fixed layout

184. The word Kanban is most appropriately associated with

(A) Economic order quantity

(B) Just-in-time production

(C) Capacity planning

(D) Product design

185. In electrical discharge machining, the tool is made of

(A) Copper

(B) HSS

(C) Cast iron

(D) Plain carbon steel

186. Which of the following gear manufacturing processes is based on generation principle?

(A) Gear hobbing

(B) Gear shaping

(C) Gear milling

(D) Gear shaving

187. In powder manufacturing process of manufacturing maximum temperature is associated with

(A) Briquetting

(B) Sintering

(C) Pre-sintering

(D) Blending

188. The use of fixture reduces

(A) Only operation time

(B) Tooling cost

(C) Only setting time
(D) Both setting time and operation

189. The cutting tool material normally used for turning steel of very high hardness is
(A) HSS
(B) Tungsten carbide
(C) CBN
(D) Diamond

190. Reaming is primarily used for achieving
(A) High MRR
(B) Improved dimensional tolerance
(C) Fine surface finish
(D) Improved positional tolerance

191. The statement is correct about 8086 microprocessors.
(A) Intel's first x 86 processor
(B) Motrola's first x 86 processor
(C) STMICROELECTRONICS's first x 86 processor
(D) NanoXplore x 86 processor

192. How many opcodes are present in 8-bit microprocessor?
(A) 246
(B) 278
(C) 250
(D) 256

193. Number of flip-flops are present in flag register of 8085 microprocessor.
(A) 4
(B) 5
(C) 7
(D) 10

194. Before PLC's what kind of equipment was used by industries?
(A) Relays
(B) Capacitors
(C) Resistors
(D) None of the above

195. The first PLC model that was introduced in 1964 is
(A) PLC 084
(B) PLC 085
(C) PLC 086

(D) None of the above

196. Actuators can be :
   (A) Displays
   (B) Motors
   (C) Sound
   (D) All of the above

197. A ———————— is a device, which converts signals from one from to another.
   (A) Hydraulic
   (B) Proximity
   (C) Pneumatic
   (D) Transducers

198. Traffic light system is the example of
   (A) Open-loop system
   (B) Closed loop system
   (C) Both (A) and (B)
   (D) None of these

199. Robot is derived from Czech word
   (A) Rabota
   (B) Robota
   (C) Rebota
   (D) Ribota

200. How many systems does a robot have?
   (A) 2
   (B) 6
   (C) 4
   (D) 3

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