Choose the correct answer:

1. Which gear arrangement is used to change the circular motion of horizontal to vertical without change in speed ratio?
   a. Two spur gear
   b. Two helical gear
   c. Two bevel gear
   d. Worm and worm gear

2. A systematic approach for maintenance is
   a. Problem – Cause – Diagnosis – Rectification
   b. Problem – Diagnosis – Cause – Rectification
   c. Problem – Measure – Diagnosis – Rectification
   d. Problem – Diagnosis – Measure – Rectification

3. A gear wheel has 36 teeth and 3 mm module, its pitch diameter is?
   a. 12 mm
   b. 75 mm
   c. 80 mm
   d. 108 mm

4. What will be the result if the clearance angle in drill is increased?
   a. Poor wedging action
   b. Weak cutting edge
   c. Rough hole surface
   d. Increased point angle

5. The main purpose of using worm and worm wheel drives in machines and their accessories is to?
   a. Transmit large torque
   b. Provide large speed reduction from worm shaft to worm wheel
   c. Transmit higher speeds
   d. Provide large speed reduction from worm wheel to worm shaft

6. The tooth thickness of rack is measured by?
   a. Universal vernier caliper
   b. Gear tooth vernier caliper
   c. Flange micrometer
   d. Gear tester

7. Which one of the following groups of properties enables the manufacture of chain hooks from wrought iron?
   a. Ductility, malleability and hardness
   b. Hardness, toughness and ductility
   c. Malleability, ductility and toughness
   d. Hardness, toughness and brittleness

8. The composition of soft solder is
   a. Lead-37%, tin-63%
   b. Lead-50%, tin-50%
   c. Lead-63%, tin-37%
   d. Lead-70%, tin-30%
9. The filler metal used in brazing has melting point of above
   a. 200°C
   b. 300°C
c. 420°C
d. 520°C

10. The commonly used flux in brazing is
   a. Borax
   b. Rosin
c. Lead sulphide
d. Zinc chloride

11. A high viscosity index indicates relatively ________ changes in viscosity of the oil with
    the temperature.
   a. Larger
c. Constant
   b. Smaller
d. None of these

12. ________ is the property of lubricating oil due to which the oil particles stick with the
    metal surfaces.
   a. Oliness
   b. Pour point
c. Adhesiveness
d. None of these

13. The use of jigs and fixtures
   a. Facilitates deployment of less skilled labour for production
   b. Eliminates pre-machining operations like marking, measuring, laying out etc.
c. Reduces manual handling operations
da. All of these

14. The following is(are) the function(s) of a jig
   a. Holding the workpiece
c. Guiding the cutting tool
   b. Locating the workpiece
da. All of these

15. Fixtures are used in
   a. Milling
c. Turning
   b. Shaping
da. All of these

16. The following holds the work piece securely in a jig or fixture against the cutting forces
   a. Locating device
c. Guiding device
   b. Clamping device
da. Indexing device

17. The following material is commonly used for making locating and clamping devices
   a. High carbon steel
c. High speed steel
   b. Low carbon steel
da. Die steel

18. The following type of jig suits best for drilling of holes in hollow cylindrical components,
    with relatively smaller outside and inside diameters, such as bushes
   a. Solid type jig
c. Box type jig
   b. Pot type jig
da. Open type jig

19. The following type of jig is used to drill a series of equidistant hole along a circle
   a. Index jig
c. Open type jig
   b. Plate type jig
da. Pot type jig
20. The jigs and fixtures can be constructed through
   a. Casting
   b. Fabrication
   c. Welding
   d. All of these

21. Which material is used for pipes which conduct water and air?
   a. Stainless steel
   b. Copper
   c. Ceramic
   d. Plastic

22. Which of the following valves is used to maintain pressure in the system?
   a. Pressure relief valve
   b. Check valve
   c. Manual control valve with variable flow plug
   d. Pneumatic control valve with variable-flow plug

23. _________ is the property of a lubricating oil due to which the oil retains a thin film between the two surfaces.
   a. Oiliness
   b. Film Strength
   c. Adhesiveness
   d. None of these

24. Maintenance consists of the following action(s)
   a. Replacement of components
   b. Repair of components
   c. Service of components
   d. All of these

25. Class-A fire consists of fire due to
   a. Wood
   b. Oil
   c. Transformer
   d. Chemical

26. Water is used to extinguish
   a. Class-A fires
   b. Class-B fires
   c. Class-C fires
   d. All of these

27. The following class of fire occurs in electrical equipment
   a. Class-A fires
   b. Class-B fires
   c. Class-C fires
   d. All of these

28. The following extinguisher is suitable for cotton or other textile fire
   a. Water
   b. Soda acid
   c. Foam
   d. Dry chemicals

29. _______ is best suited to extinguish oil or flammable liquid fire.
   a. Soda acid
   b. Vaporizing liquid
   c. Foam
   d. Dry chemical

30. An alloy is a
   a. Pure metal
   b. Mixture of metals in any proportion
   c. Mixture of metals in fixed proportion
   d. Mixture of two non-metals
31. Bronze is an alloy of
   a. Copper and Nickel
   b. Copper and iron
   c. Copper and Tin
   d. Copper and Aluminium

32. Which of the following is not an alloy?
   a. Steel
   b. Copper
   c. Brass
   d. Bronze

33. Duralumin is an alloy of
   a. Aluminium and Copper
   b. Aluminium and iron
   c. Aluminium and Carbon
   d. Aluminium and mercury

34. Which of the following alloy is used in making aircraft structures?
   a. Duralumin
   b. Brass
   c. Bronze
   d. Manganin

35. Which of the following method is adopted for preventing corrosion by acids?
   a. Deaeration
   b. Removal by using ion-exchange resin
   c. Neutralisation with lime
   d. Dehumidification

36. Which of the following method is adopted for preventing corrosion by moisture?
   a. Deaeration
   b. Removal by using ion-exchange resin
   c. Neutralisation with lime
   d. Dehumidification

37. The process which lowers the content of sulphur and phosphorus in steels is known as
   a. Refining
   b. Passivation
   c. Inhibition
   d. Stimulation

38. Annealing is a heat treatment given to metals to
   a. Prevent dezincification
   b. Remove the residual stresses
   c. Lower the sulphur content
   d. Form a protective layer

39. Magnesium is used in high resistivity electrolytes due to its
   a. Neutral potential
   b. Most positive potential
   c. Most negative potential
   d. Zero potential

40. Crowning of a pulley is done to
   a. Prevent the slipping of a belt
   b. To increase the tension of a belt
   c. To increase the angle of contact
   d. None of these

41. In which of the following drives, there is no slip
   a. Open belt drive
   b. Crossed belt drive
   c. Rope drive
   d. Chain drive
42. The angle of contact (θ) for crossed belt drive is given by
   a. 180-2α
   b. 180+2α
   c. 180–α
   d. 180+α

   The value of α is given by \( \sin \alpha = \frac{r_1 + r_2}{x} \), Where \( r_1 \) = Radius of larger pulley, \( r_2 \) = Radius of smaller pulley, \( x \) = Distance between the centers of the two pulleys.

43. The power transmitted by a belt drive is given by
   a. \( (T_1-T_2) \times v \)
   b. \( (T_1-T_2) \times \omega \)
   c. \( \frac{(T_1-T_2)}{v} \)
   d. \( \frac{(T_1-T_2)}{\omega} \)

   Where, \( T_1 \) = Tension on tight side, \( T_2 \) = Tension on slack side, where \( v \) = linear velocity, \( \omega \) = angular velocity.

44. Economy in material handling can be achieved by
   a. Employing gravity feed movements
   b. Minimizing distance of travel
   c. By carrying material to destination without using manual labour
   d. All of these

45. Principle of ‘Unit load’ states that
   a. Materials should be moved in lots
   b. One unit should be moved at a time
   c. Both (a) & (b)
   d. None of these

46. Fork lift truck is used for
   a. Lifting and lowering
   b. Vertical transportation
   c. Both (a) & (b)
   d. None of these

47. Rag bolt is a type of:
   a. Welding bolt
   b. Foundation bolt
   c. Heavy duty bolt
   d. Locking bolt

48. Lubricating oil
   a. Minimizes wear in moving parts
   b. Helps in keeping the parts cool
   c. Washes away and carries away dirt
   d. All of these

49. In the following system, lubricating oil is carried in separate tanks from where it is fed to the engine
   a. Mist lubrication system
   b. Wet sump system
   c. Dry sump system
   d. Splash system

50. ___________ is the ability of the oil to resist internal deformation due to mechanical stresses.
   a. Viscosity
   b. Flash point
   c. Fire point
   d. None of these