

1. The tool not used for marking
- (a) Surface gauge      (b) Angle plate      (c) Divider      (d) **Micrometer**

Ans:(d)

2. Item used for marking aluminium work piece

- (a) Lead pencil      (b) **Blue pencil**  
(c) Chalk      (d) Red pencil

Ans:(b)

**Note:** Marking out and measuring tools These are the tools used for marking out and measuring that you need to know about: rules punches squares templates gauges micrometers scribes. Rules There are two basic types of rule: steel rule and steel tape. Both start at zero and have millimetre graduations.

3. The following is not probable reasons for caliper not giving correct reading

- (a) Legs are over tight on the riveted joint  
(b) Legs are too free on the riveted joint  
(c) **Measuring faces are not coinciding perfectly**  
(d) Calliper is old.

Ans:(c)

4. Flatness is checked

- (a) By straight edge      (b) By surface plate  
(c) By dial test indicator      (d) **By all the above**

Ans:(d)

6. Template is

- (a) Model of an object  
(b) **Designed to required profile in least expense**  
(c) Made generally from mild steel sheet  
(d) All of the above

Ans:(b)

7. Purpose of using a template

- (a) For making of identical parts  
(b) For checking the shape of manufactured parts

- (c) Both a and b
- (d) None

Ans:(c)

8. Mass production does not have the following advantages

- (a) Manufacturing time of component is reduced
- (b) Cost of a component is reduced
- (c) Components are interchangeable
- (d) It does not require special manufacturing facility

Ans:(d)

**Note: Mass production** is the **manufacturing** of large quantities of standardized products, often using assembly lines or automation technology. **Mass production** facilitates the efficient **production** of a large number of similar products

9. Power may be transmitted to machines by

- (a) Shafts
- (b) Belt drive -Pulleys and belts
- (c) Chain drives and gear drives
- (d) All the above

Ans: (d)

10. What is preventive maintenance of machines?

Preventive maintenance refers to any regularly scheduled machine maintenance intended to identify problems and repair them before failure occurs. Preventive maintenance can be split up into two predominant types: Time-based preventive maintenance such as monthly, half yearly, yearly etc and usage-based preventive maintenance- eg., machine hours, engine hours, engine kilometer

11. The force required to punch a hole of 20 cm diameter, d on a sheet of 2 mm thick with a shear strength of 49 kg/sq mm is

- (a) 6.16 T
- (b) 123.2 T
- (c) 61.6 T
- (d) 30.8T

Ans:(c)

12. In cold punching, the clearance between punches and dies is ...% of the plate thickness

- (a) 2
- (b) 5
- (c) 10
- (d) 20

Ans: (d)

13. Lubricant is used

- (a) To reduce friction
- (b) To minimise heat between contact surfaces

- (c) To save from rust and corrosion
- (d) All the above

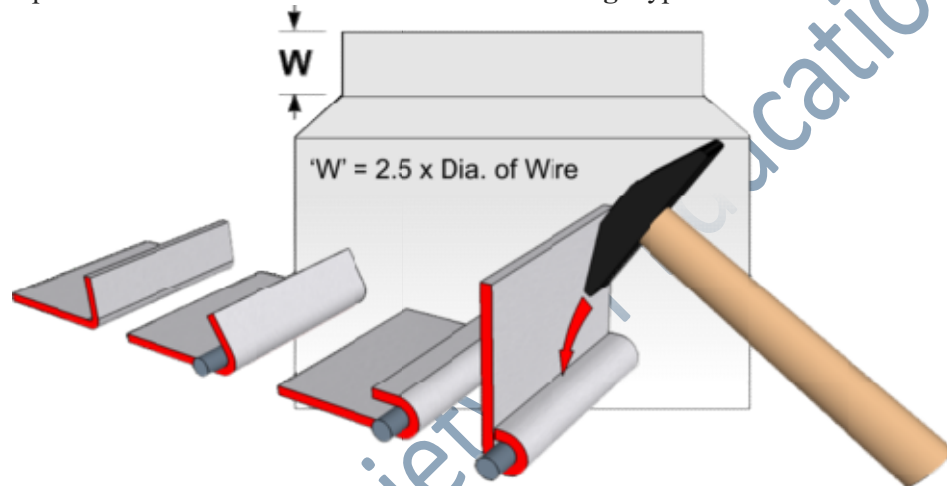
Ans: (d)

14. The utility of wired edges in sheet metal

- (a) To strengthen the job
- (b) To avoid sharp edges
- (c) Both a and b
- (d) None

Ans: (c)

The edges of thin sheet metals can be made safe and given additional rigidity by folding the top rim around a thick wire to create a **Wired Edge** type of **Hem**.



[http://wiki.dtonline.org/index.php/Wired\\_Edge#:~:text=The%20edges%20of%20thin%20sheet,Wired%20Edge%20type%20of%20Hem.](http://wiki.dtonline.org/index.php/Wired_Edge#:~:text=The%20edges%20of%20thin%20sheet,Wired%20Edge%20type%20of%20Hem.)

15. In a system of limits and fits, the algebraic difference between the upper limit and lower limit is called
- (a) Allowance
  - (b) Tolerance
  - (c) Total deviation
  - (d) Permissible deviation

Ans:(b)

16. A jig is device which

- (a) Holds the work piece
- (b) Locates the work piece
- (c) Holds the work piece and guides the tool
- (d) None

Ans:(c)

17. The operation performed for producing large hole in a sheet metal is called

- (a) Enlarging
- (b) Counter boring
- (c) Counter sinking
- (d) Trepanning

Ans:(d)

18. CNC machines are considered advantages over conventional machine because
- (a) They are cheaper
  - (b) Lesser skilled persons can operate the machines
  - (c) Large number of pieces can be machined with greater accuracy and speed
  - (d) Setting of the jobs on these machines is easier

Ans:(c)

19. Out break of fire can be avoided by preventing
- (a) Fuel
  - (b) Heat
  - (c) Oxygen
  - (d) Any one of the above

Ans:(d)

20. Constituent of paint includes
- (a) Pigment & binder
  - (b) Pigment & thinner
  - (c) Pigment binder & thinner
  - (d) None of these

Ans:(a)

**Note:** Most paints consist of the same basic components: **pigments**, binders, liquids, and additives. Each component serves a role in determining the quality of the paint as well as its performance both during and after application.

#### Constituents of Paint

Paints are variable combinations of – Binder – Pigment – Filler/ Extender – Volatile organic compound (Thinner) – Driers – Additives (Anti skinning agents, Anti settling agent, Plasticizers, fire retardants etc

<https://irimee.indianrailways.gov.in/instt/uploads/files/1434527960358-Paints.pdf>

21. The element giving colour to the paint
- (a) Binder
  - (b) Thinner
  - (c) Both a and b
  - (d) Pigment

Ans: (d)

22. For small component of complicated shape the suitable application of paint
- (a) Spray painting
  - (b) Dip painting
  - (c) Flow painting
  - (d) Electrostatic painting

Ans:(b)

23. Galvanic corrosion requires

- (a) An electroiyte
- (b) Anode and cathode in close contact
- (c) Both a and b
- (d) None of the above

Ans:(c)

**Note:** Galvanic corrosion refers to corrosion damage induced when two dissimilar materials are coupled in a corrosive electrolyte. The presence of an electrolyte and an electrical conducting path between the metals is essential for galvanic corrosion to occur. When a galvanic couple forms, one of the metals in the couple becomes the anode which corrodes than it would all by itself, while the other becomes the cathode. The electrolyte provides a means for ion migration whereby ions move to prevent charge build-up that would otherwise stop the reaction.

24. The test that helps to determine porosity of the painted surface.

- (a) Salt spray test
- (b) Baking test
- (c) Abrasion test
- (d) None

Ans:(b)

25. Importance of dry film thickness measurement is due to fact

- (a) Finish depends on thickness
- (b) Protection depends on thickness
- (c) Glass depends on thickness
- (d) Spread and consumption of paint can be compared

Ans:(b)

26. Gloss of painted surface

- (a) Highlights the imperfection on the surface
- (b) Reduces imperfection
- (c) Both a and b
- (d) None

Ans:(a)

NOTE: HOW IS GLOSS OF PAINTED SURFACE MEASURED?

A **glossmeter** (also **gloss meter**) is an instrument which is used to measure the specular reflection (gloss) of a surface. Gloss is determined by projecting a beam of light at a fixed intensity and angle onto a surface and measuring the amount of reflected light at an equal but opposite angle.

27. Measure of paint dry film thickness is given by

- (a) Metre
- (b) sq.mm
- (c) Microns
- (d) sq.cm

Ans:(c)

28. Shot peening is

- (a) Recommended for casting
- (b) Pre-requisite for painting
- (c) Used to induce compressive stress on surfaces of components subjected to fatigue
- (d) Similar to grit blasting

Ans:(c)

**Note:** Shot peening is a cold working process used to produce a compressive residual stress layer and modify the mechanical properties of metals and composites. It entails striking a surface with shot with force sufficient to create plastic deformation

29. Phosphating is

- (a) Similar to painting
- (b) A method of painting
- (c) An anti-corrosive treatment
- (d) None

Ans: (c)

30. Poor adhesion of paint could be due to

- (a) Insufficient drying
- (b) Insufficient mixing
- (c) Poor spray technique
- (d) Inadequate cleaning

Ans:(d)

31. Prime purpose of painting is

- (a) Coverage of surface and surface protection from corrosion/rusting
- (b) Elegance
- (c) Gloss
- (d) Smoothness

Ans:(a)

32. The formula for converting Fahrenheit to Centigrade scale

- (a)  $\frac{5}{9} (^{\circ}\text{F}-32)$
- (b)  $\frac{9}{5} (^{\circ}\text{F}-32)$
- (c)  $(^{\circ}\text{F}-32)/5$
- (d)  $(^{\circ}\text{F}-32)/9$

Ans:(a)

33. Humidity condition suited for painting job

- (a) 80%
- (b) 100%
- (c) < 80%
- (d) > 85%

Ans:(c)

34. Advantage of heat treatment of metal

- (a) Hard metal can be softened
- (b) Soft metal can be hardened
- (c) Machinability/cold working of metal can be improved(process annealing)
- (d) All the above

Ans: (d)

35. Which of the following process does not belong to heat treatment

- (a) Annealing
- (b) Hardening
- (c) Normalising
- (d) Trepanning

Ans: (d)

The most commonly used operations of heat treatment for iron and steel are:

1. Annealing
2. Normalising
3. Hardening
4. Tempering

**Surface hardening/Case hardening METHODS**

Carburising (Case-Hardening)

Cyaniding

Nitriding

Induction Hardening

Flame-Hardening.

36. Sound waves cannot travel through

- (1) Iron
- (2) Hydrogen
- (3) Mineral Oil
- (4) Vacuum

37. A generator converts

- (1) Mechanical energy into light energy
- (2) Electrical energy into mechanical energy
- (3) Mechanical energy into electrical energy
- (4) None of these

38. A motor converts

- (1) Mechanical energy into light energy
- (2) Electrical energy into mechanical energy
- (3) Mechanical energy into electrical energy
- (4) None of these

39. Which of the following currents is considered dangerous for the human body?

- (1) 1 A      (2) 1 mA      (3) 30 mA and above      (4) 50 mA

Ans (3). When an electrical current passes through the body, the nervous system experience an electric shock. The intensity of the shock depends mainly on the strength of the current and the path taken by the current through the body and the duration of contact.

Note 1:

### GENERAL EFFECTS OF ELECTRIC CURRENT

Electric current (contact for 1s)	Effect
Below 1 mA	Not perceptible
1 mA	Threshold of feeling, tingling
5 mA	Slight shock. Not painful. Average individual can let go. Involuntary reaction can lead to indirect injuries
6-25 mA (women)	Painful shocks. Loss of muscle control
9 to 30 mA (men)	Freezing current, "can't let go". The person may be thrown away from the power source. Individual cannot let go. Strong involuntary reaction can lead to involuntary injuries
50 to 150 mA	Extreme pain. Respiratory arrest. Muscles reactions. Possible Death.
1 to 4.3 A	Fibrillation of the heart. Muscular contraction and nerve damage occur. Likely death.
10 A	Cardiac arrest, severe burns. Death is probable

[https://www.wikilectures.eu/w/Physiological\\_effect\\_of\\_electric\\_current](https://www.wikilectures.eu/w/Physiological_effect_of_electric_current)

### NOTE 2: EFFECTS OF ELECTRIC CURRENT ON HUMAN BODY

It is believed that the current below 5mA are not dangerous. The current between 10 to 20 mA is dangerous because the sufferer loses muscular control. If the resistance of the human body has assumed as 20kΩ, then a contact with 230 volt supply can be potentially fatal,  $230/20,000 = 11.5 \text{ mA}$ .

40. The rate of change of velocity of a moving body is

- (1) Acceleration      (2) Velocity      (3) Momentum      (4) Impulse

Ans: (1)

41. The rate of change of displacement of a moving body is

- (1) Acceleration      (2) Velocity      (3) Momentum      (4) Impulse

Ans: (2)

42. Bar is the unit of



- (1) Power                      (2) energy                      (3) pressure                      (4) entropy

Ans: (3)

43. An electric bulb (now phased out) has a filament made of:

- (1) Copper                      (2) Carbon                      (3) Nichrome                      (4) Tungsten

Ans: (4)

44. In an electrical circuit, a fuse is connected

- (1) In the live wire                      (2) in the neutral wire  
(3) In the earth wire                      (4) anywhere – it makes no difference

Ans: (3)

Note: The fuse wire is always connected in the live wire of the circuit because if the fuse is put in the neutral wire, then due to excessive flow of current when the fuse burns, current stops flowing in the circuit, but the appliance remains connected to the high potential point of the supply through the live wire

45. The device used for converting electrical energy into mechanical energy is

- (1) Cell                                      (2) Transformer  
(3) Dynamo                                      (4) Electric motor

Ans: (4)

46. The process by which heat generated in the Sun is due to

- (1) Fission of Uranium                      (2) fusion of Helium  
(3) Fusion of Hydrogen                      (4) combination of all these process

Ans: (3)

47. The process by which heat is generated in a nuclear reactor is due to

- (1) Fission of Uranium atoms                      (2) fusion of Helium atoms  
(3) Fusion of Hydrogen atoms                      (4) combination of all these process

Ans: (1)

48. The work done in holding a weight of 20 kg at a height of 1 m above the ground is

- (1) Zero (2) 20 J  
(3) 200 J (4) 2000 J

Ans: (1)

Note: In the absence of displacement of a force, no work is done.

49. The device used for converting mechanical energy into electrical energy is

- (1) Cell (2) Transformer  
(3) Dynamo (4) Electric motor

Ans: (3)

50. Hydraulic press/ hydraulic brakes in automobiles work on the principle of:

- (1) Newton's second law of motion (2) Pascal's principle  
(3) Pascal's law (4) Archimedes' principle

Ans: (3)

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