# PRACTICE SET - 1

**1. The SI unit of sound wave frequency was named in honour of which physicist?**
(a) Werner Karl Heisenberg
(b) Heinrich Rudolf Hertz
(c) Albert Einstein
(d) J C Maxwell

**2. Hotmail was launched in:**
(a) 1993 (b) 1995
(c) 1996 (d) 1994

**3. Which one of these is the parent company of Google?**
(a) GV (b) Nest Labs
(c) Calico (d) Alphabet inc

**4. The existence of potential energy implies that**
(a) a conservative force field exist
(b) a general force field exist
(c) the body should be in equilibrium
(d) None of the above

**5. Copies of printed A3 drawings are to be kept in a cabinet. The width of the border lines should be _____ mm.**
(a) 20 (b) 15
(c) 7.5 (d) 10

**6. In a certain weightlifting machine, a weight of 100 kg is lifted by an effort of 25 kg. The mechanical advantage is**
(a) 4 (b) 40
(c) $\frac{1}{4}$ (d) $\frac{1}{40}$

**7. Which of the following should not be kept in a first-aid kit?**
(a) Sterile dressings (b) Plasters
(c) Eye dressing (d) Headache tablets

**8. The resistivity of the material of wire having resistance 0.7 Ω, length 1 m and diameter 0.2 mm is:**
(a) $2.2 \times 10^{-8}$ Ωm (b) $22 \times 10^{-8}$ Ωm
(c) $0.22 \times 10^{-8}$ Ωm (d) $220 \times 10^{-8}$ Ωm

**9. If a patient does not respond to mouth resuscitation treat a first aider should immediately……**
(a) seek medical help
(b) check for broken limbs
(c) keep the body warm with blankets
(d) check pupils of eyes and pulse

**10. First of the major environmental protection act to be promulgated in India was**
(a) The Air Act
(b) The Water Act
(c) The Environment Act
(d) Noise pollution rules

**11. Which of the following statements about carbon monoxide is true?**
(a) All of the options
(b) It is result of incomplete combustion of fossil fuels
(c) It is a foul smelling gas
(d) It is harmless to human beings

**12. Conversion of energy in electric motor is:**
(a) Sunlight to electrical energy
(b) Electrical energy to heat energy
(c) Mechanical energy to electrical energy
(d) Electrical energy to mechanical energy

**13. For which purpose India's fastest and the first multi-PetaFlops (OF) supercomputer 'Pratyush' used.**
(a) Weather forecasting
(b) Pharmaceutical development
(c) Seismic data analysis
(d) Scientific data processing

**14. Which one of the following is NOT a web browser?**
(a) Google Chrome (b) Wikipedia
(c) Opera (d) Mozilla Firefox

**15. The common domestic power supplied in India is given by which of the following?**
(a) 110V, 60 Hz (b) 220V, 50 Hz
(c) 110V, 50 Hz (d) 220V, 100 Hz

**16. Ram bought a bulb rated as 50 W and 220 V. When it is connected to a 220 V supply, its resistance will be:**
(a) 1068 Ω (b) 1098 Ω
(c) 868 Ω (d) 968 Ω

**17 . An electric bulb of 40 Ω resistance and a conductor of 10 Ω resistance are connected to a 10 V battery. The total resistance of the circuit is:**
(a) 40 Ω (b) 30 Ω
(c) 50 Ω (d) 60 Ω

**18. "The workdone in moving a unit charge across two points of an electrical circuit" is called .....**
(a) Potential difference (b) current
(c) power (d) resistance

**19. Combustion of fossil fuels is the main cause of –**
(a) Nitrogen oxide pollution
(b) Nitrous oxide pollution
(c) Sulphur dioxide pollution
(d) Nitric oxide pollution

**20. Which of the following is more environmentally friendly?**
(a) Burning of diesel
(b) Burning of charcoal
(c) Burning of wood
(d) Burning of coal

**21. If the amount of work is done in moving the charge of 3 coulombs across two points is 72 J. Then what would be the potential difference across these points?**

(a) 24 V (b) 216 V
(c) 240 V (d) 2.4 V

**22. Which of the following green house gas is not included under the Kyoto Protocol?**

(a) $CO_2$ (Carbon dioxide)
(b) $O_3$ (Ozone)
(c) $CH_4$ (Methane)
(d) $N_2O$ (Nitrous oxide)

**23. What is the density of water-**

(a) 1000 kg / cubic meter
(b) 10 kg / cubic meter
(c) 1 kg / cubic meter
(d) 2 kg / cubic meter s

**24. Which of the following reasons, clouds to float in the sky?**

(a) Low temperature (b) Low speed
(c) Low pressure (d) Low density

**25. A driver drives his car at the constant speed and covers a distance of 288 m in 60 s. Find the speed**

(a) 4.8 m/s (b) 3.8 m/s
(c) 5.8 m/s (d) 8.8 m/s

**26. The image of an object obtained on a two dimensional piece on paper is known as_____.**

(a) Shadow (b) Projection
(c) Scene contour (d) None of these

**27. Orthographic means_____.**

(a) Horizontal (b) Perpendicular
(c) Inclined (d) None of these

**28. The essential item(s) in a title block is/are_____.**

(a) Revision number.
(b) Date of revision
(c) Previous revisions with dates
(d) All of (a), (b) and (c)

**29. Kiran swims in a 90 m long pool. She covers 360 m in two turns by swimming from one end to the other and back along the same position of straight path. Find the average velocity of Kiran.**

(a) 0 $ms^{-1}$ (b) 3 $ms^{-1}$
(c) 5 $ms^{-1}$ (d) 4 $ms^{-1}$

**30. ..... is used to describe the overall motion of an object and to find its final position in terms of its initial position at a given time.**

(a) Distance and speed
(b) Velocity and speed
(c) Distance and displacement
(d) Displacement and velocity

**31. The product of velocity and time provides.**

(a) distance (b) displacement
(c) momentum (d) speed

**32. In MS-Excel, how to use format painter multiple times?**

(a) By clicking on lock format painter Icon
(b) By double clicking on the format painter Icon
(c) By single clicking on the format painter Icon
(d) Format painter cannot be used multiple times

**33. In Microsoft Word 2016, what happens when we press the keyboard shortcut 'Ctrl + E'?**

(a) Selected text is cut
(b) Selected text is made bold
(c) Selected text is centre aligned
(d) A pop-up prompts you to open a new file

**34. The speed increases of ships is based on-**

(a) Theory of Archimedes
(b) Faraday law
(c) Flaming right hand rule
(d) Newton's second law of motion

**35. In an engineering drawing, which letters written on the dimension indicates that it is an extra information and NOT really required?/**

(a) NR (b) PER
(c) REF (d) EXT

**36. The standard for lettering on technical drawing to be followed in India is_____.**

(a) SP 46 : 2003 (b) IS 696
(c) IS : 9609-2001 (d) IS 1444 : 1989

**37. The notation ϕ7 means _____ .**

(a) depth of wall 7 units
(b) diameter 7 units
(c) Length of side 7 units
(d) radius 7 units

**38. The building and movement of ships is based on .....**

(a) Downward direction
(b) Opposite direction
(c) Same direction
(d) Upward direction

**39. Two types of single-stroke letter are _____ and _____.**

(a) Vertical (b) Horizontal
(c) Inclined (d) (a) and (c)

**40. The abbreviation SR marked on an engineering drawing stands for:**

(a) Sectional Recess (b) Spherical Radius
(c) Surface Relief (d) Screw Runner

**41. When the potential difference is 18V then the work is done moving a charge of 4C across two points is ……..**

(a) 7.2 J (b) 4.5 J
(c) 72 J (d) 24 J

**42. On finding a fire in a building a machinist's first action should be**

(a) Raise an alarm (b) Fight the fire

(c) Leave the building (d) Carry on working

**43. Electric charge (Q) / time (t) = .....**

(a) Electric current (I)

(b) Potential difference (PD)

(c) resistivity

(d) resistance (R)

**44. A 4 Ω resistor, A is connected in series to a 6 Ω resistor, B and a 2 V battery. The potential drops across A and B are respectively _____.**

(a) 0.6 V and 1.4 V (b) 1.2 V and 0.8 V

(c) 1.4 V and 0.6 V (d) 0.8 V and 1.2 V

**45. The net resistance of the two resistors connected in series is 6 ohm. If one of the resistances is 2 ohm, what is the other resistance if the current flowing through them is 4 amp?**

(a) 4 ohm (b) 8 ohm

(c) 12 ohm (d) 3 ohm

**46. A _____ is a system designed to prevent unauthorized access to or from a private network.**

(a) Server (b) Packet

(c) Firewall (d) Web page

**47. Which one is the reducing scale?**

(a) 1 : 1 (b) 5 : 1

(c) 10 : 1 (d) 1 : 2

**48. In a technical drawing a mix of vertical and sloping letters can be used.**

(a) True

(b) False

(c) Depends upon situation

(d) None

**49. Roman lettering is used in _____ drawings**

(a) Engineering (b) Machine

(c) Architectural (d) Civil

**50. What is the binary representation of 32?**

(a) 100001 (b) 100100

(c) 100000 (d) 110000

# SOLUTION : PRACTICE SET- 1

## ANSWER KEY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1. (b)** | **6. (a)** | **11. (b)** | **16. (d)** | **21. (a)** | **26. (d)** | **31. (b)** | **36. (c)** | **41. (c)** | **46. (c)** |
| **2. (c)** | **7. (d)** | **12. (d)** | **17. (c)** | **22. (b)** | **27. (b)** | **32. (b)** | **37. (b)** | **42. (a)** | **47. (d)** |
| **3. (d)** | **8. (a)** | **13. (a)** | **18. (a)** | **23. (a)** | **28. (d)** | **33. (c)** | **38. (b)** | **43. (a)** | **48. (b)** |
| **4. (a)** | **9. (a)** | **14. (b)** | **19. (c)** | **24. (d)** | **29. (a)** | **34. (a)** | **39. (d)** | **44. (d)** | **49. (a)** |
| **5. (d)** | **10. (b)** | **15. (b)** | **20. (b)** | **25. (a)** | **30. (c)** | **35. (c)** | **40. (b)** | **45. (a)** | **50. (c)** |

## SOLUTION

**1. (b)**

The term 'Hertz' was proposed in the early 1920s by German scientists to honour the 19th century German physicist Heinrich Hertz. Hertz is a part of International System of Units or SI System which is based on the Metric System.

**2. (c)**

Sabeer Bhatia is an Indian Origin US industrialist and is also the co-founder of Hotmail. In 1996 Sabeer Bhatia and Jack Smith launched "Hotmail". In 1997 it was bought by the tech giant Microsoft Corporation.

**3. (d)**

Google abruptly renamed itself Alphabet inc in 2015, making Google a subsidiary. As a parent company Alphabet inc allowed Google to expand into domains outside of Internet Search.

**4. (a)**

The existence of potential energy implies that a conservative force field exist.

•A conservative force is one for which workdone by or against it depends only on the starting and ending points of a motion and not the path-taken.

**5. (d)** For the sheet of A3 drawing paper the width of the border lines should be 10 mm as per SP 46 : 2003.

• It is recommended that borders have a min. width of 20 mm for the sizes A0 & A1 and a minimum width of 10 mm for other series.

**6. (a)** Given,

lifted weight (W) = 100 kg

effort (P) = 25 kg

we know that,

mechanical advantage,

$$MA = \frac{W}{P} = \frac{100}{25} = 4$$

**7. (d)** A workshop should have the following facilities and medicine for first aid treatment.

• Tincture iodine • Tincture benzoin • Dettol • Burnol

• Pain killers • Bandage • Cotton • Safety pin • Raw plaster • Wooden splinters • Netted cloth • Gloss for giving medicines • Gloss for cleaning eyes • Dropper

• Stretcher etc.

• Headache tablets not be kept in a first-aid kit.

**8. (a)** Given,

Resistance (R) = 0.7Ω

Length (L) = 1m

Diameter (d) =0.2 mm

$$\text{Radius (r)} = \frac{d}{2} = \frac{0.2\times10^{-3}}{2} = 0.1\times10^{-3}\,\text{m}$$

As we know that,

$$R = \frac{\rho L}{\pi r^2}$$

$$\rho = \frac{R\times\pi r^2}{L}$$

$$= \frac{0.7\times22\times\left(0.1\times10^{-3}\right)^2}{1\times7}$$

$$= 0.1\times22\times0.01\times10^{-6}$$

$$= 0.1\times22\times0.01\times10^{-6}$$

$$= 22\times10^{-9}$$

$$= 2.2\times10^{-8}$$

**9. (a)** If a patient does not respond to mouth resuscitation treat, a first-aider should seek medical help.

**10. (b)** Among the following the Water Act of 1974 is the first major environmental protection act to be promulgated in India.

**11. (b)** Among the following only option (b) seems to be true i.e. this gas evolves due to incomplete combustion of fossil fuels.

**12. (d)** The electric motor converts electrical energy into mechanical energy.

**13. (**a) Pratyush, a Cray $XC_{40}$ system is an array of computers that can deliver a peak power of 6.8 Petaflops, installed at the Indian Institute of Tropical Meteorology (IITM), Pune and it is the fastest supercomputer in India. It was launched in January 2018. It is fourth fastest High Performance Computer (HPC) dedicated to climate modeling in the world.

**14. (b)** A web browser is a software application that is used to access the World Wide Web (WWW).

It is an interface between user and the information available on the web. Some of the common browsers are Mozilla Firefox, Safari, Internet Explorer, Netscape etc.

**15. (b)** The voltage and frequency at domestic power supply used in India are 220 Volt and 50 Hz.

**16. (d)** Given that, P = 50W, V = 220 V, R =?

$$\text{by using the formula} \Rightarrow P = \frac{V^2}{R}$$

$$\Rightarrow R = \frac{220\times220}{50} = 44\times22 = 968\Omega$$

**17. (c)** Given that $R_1 = 40\Omega$ R, $R_2 = 10\Omega$ V = 10V

Assuming is in series connection

$R_{eq} = R + R_2 = 40 + 10 = 50\Omega$

**18. (a)**

**Potential Difference :** The potential difference between any two points in an electric circuit is the amount of work done in bringing a unit positive charge from one point to the other.

Potential difference (V) = Work (W) / Charge (Q)

The SI unit of potential difference is Joule/Coulomb or Volt.

**19. (c)**

Combustion of fossil fuels is the main cause of Sulphur dioxide pollution. Sulphur dioxide (47%) Nitrogen oxide (30%), Nitrous oxide (13%) and Nitric oxide (10%) contributes to Sulphur dioxide pollution. The fossil fuels like coal and petroleum contain small amounts of nitrogen and sulphur. When these fuels are burnt, nitrogen and sulphur too are burnt and this produces different oxides of nitrogen and sulphur. The burning of fossil fuels produces acidic gases such as sulphur dioxide and nitrogen oxide. These acidic gases cause acid rain that affects our water and soil resources.

**20. (b)**

Burning of charcoal is more environmentally friendly. It does not produce smoke while burning. Thus no air pollution is caused.

**21. (a)**

Given,

Q = 3 C

W = 72 J

V = ?

Potential difference = work/ charge

$$= \frac{72}{3} = 24\,\text{V}$$

**22. (b)**

Ozone gas ($O_3$) is not included under Kyoto Protocol. Kyoto Protocol is an international treaty to reduce green house gas emissions. It was adopted in Kyoto, Japan on 11 December 1997. It applies to 6 green house gases:- Carbon dioxide, Methane, Nitrous oxide, Hydrofluorocarbons, Fluoro-carbons and Sulfur hexafluoride.

**23. (a)**

The density of water is 1000 kg / $m^3$.

**24. (d)**

The reason for clouds floating in the sky is their low density. Due to the low density, the weight of clouds remain low with respect to the buoyancy force in the air and they float.

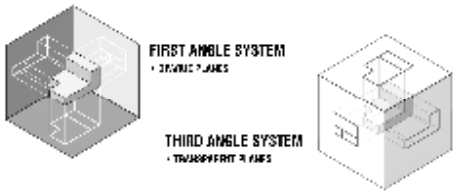
**25. (a)**

Speed = Distance / Time

$$= \frac{288}{60} = 4.8\ \text{m/s}$$

**26. (d)**

The image of an object obtained on a two dimensional piece on paper is known as orthographic projection.

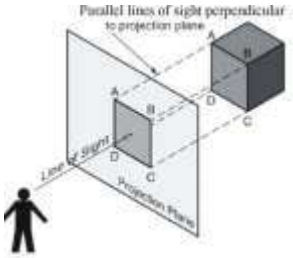



- For the complete description of the 3D object in this projection, at least two or three views are required.

**27. (b)**

Orthographic means perpendicular.

- In orthographic projections, projectors are parallel to each other and perpendicular to the plane of projection.




**28. (d)**

A revision panel is drawn either attached to the title block above it or in the top right-hand corner of the sheet.

- The revisions are recorded in it giving the revisions number, date, zone etc.

**Essential item in a title block–**

1. Revision number. 2. Date of revision 3. Previous revisions with dates.

**29. (a)**

Since Kiran is coming back from where she swimming. Hence its displacement will be zero. Therefore the average velocity will be = 0 $ms^{-1}$.

Since average velocity = displacement per unit time

$$= \frac{\text{displacement}}{\text{time}} = 0$$

**30. (c)**

When an object moves along any path from one point 'P' to another point 'Q', the magnitude of its displacement will be the lowest distance between those two points. 'Distance' and 'displacement' are used to describe the overall motion of an object and to find its final position in terms of its initial position at a given time.

**31. (b)**

The product of velocity and time is called displacement. Displacement is the shortest distance travelled by an object between two points in a certain direction. This is the vector quantity. Its S.I. unit is meter.

**32. (b)**

In MS-Excel, by double clicking on the format painter icon we use format painter multiple times.

**33. (c)**

Shortcut Buttons of MS-Office and their functions-

| **(Shortcut Button)** | **(Function)** |
|---|---|
| Ctrl + C | Copy the selected content to clipboard. |
| Ctrl + B | Apply bold formatting to text. |
| Ctrl + E | Center the text. (Align selected text) |
| Ctrl + D | Font options |
| Ctrl + V | Paste. |

**34. (a)**

The increases in speed of ships is based on Archimede's theory, when an object is immersed to fully or partially in a fluid, vertical force applied on it. That is called buoyancy force which is equal to the weight of the fluid displaced by the object. This principle is called the Archimedes Principle.

Faraday's law - relates to electric circuits.

Fleming Right Hand Rule: Related to induced current. Newton's second law of motion - the force exerted on an object is equal to the rate of change in the momentum of that object.

**35. (c)**

In an engineering drawing, REF letters written on the dimension indicates that it is an extra information and NOT really required.

**36. (c)**

**As per IS 9609 part 0 : 2001**

- Procedure of writing graphic characters taken from a graphic character set on a technical drawing cornier (in addition to the graphical representation)

- The whole of the graphic characters of a graphic character set which can be used for transforming non graphical information onto a technical drawing courier.

**37. (b)**

The notation $\phi 7$ means that the diameter of hole or bolt or nut is 7 unit.

**38. (b)**

The building and movement of ships is based on opposite direction. The upward buoyant force that is exerted on a body immersed in a fluid, whether partially or fully submerged, is equal to the weight of the fluid that the body displaced and acts in the upward direction at the center of mass of the displaced fluid.

**39. (d)**

Two type of single-stroke letter are vertical and inclined.

- The word single-stroke should not be to mean than the should be made in one stroke without lifting the pencil.
- H actually means that the thickness of the line of the letter should such as in obtained in one stroke of the pencil.
- The horizontal lines letters should be drawn from left to right and vertical or inclined lines from top to bottom.
- Inclined letters lean to the right, the slope being 75° with the horizontal

**40. (b)**

The abbreviation SR marked on an engineering drawing stand for spherical radius.

**41. (c)**

Given that, charge (Q) = 4C

Voltage (V) = 18 V

Work (W) = ?

We know that,

$W = Q \times V$

$W = 4 \times 18$

$W = 72$ J

**42. (a)**

On finding a fire in a building a machinist's first action should be raise an alarm.

**43. (a)**

Electric current : The electric current is defined as the rate of flow of electric change through any section of a conductor.

$$\text{Thus , Electric current} = \frac{\text{Charge}}{\text{Time}}$$

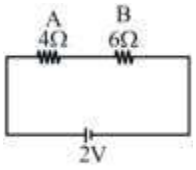
If a charge 'Q' passes through a cross-section of conductor in time t, then the current I is given by

$$I = \frac{Q}{t}$$

The SI unit of electric current is ampere (A).

$$1 \text{ ampere} = \frac{1 \text{ coulomb}}{1 \text{ second}} \text{ or } 1A = \frac{1C}{1s} = 1 \text{ Cs}^{-1}$$

**44. (d)**




Total resistance of circuit

$R = R_1 + R_2$

$R = 6 + 4 = 10\Omega$

Total current in circuit

$$i = \frac{2}{10} = 0.2A$$

Now potential drops of resistance (A)

$V = iR$

$V = 0.2 \times 4 = 0.8$V and a cross at B $= 0.2 \times 6 = 1.2$ Volt

**45. (a)**

If two resistors are $R_1$ and $R_2$ then,

In series circuit

Total resistance $R = R_1 + R_2$

Here,

$R = 6\Omega$

$R_1 = 2\Omega$

$R_2 = ?$

$R_2 = R - R_1 = 6 - 2 = 4\Omega$

**46. (c)**

A firewall is a network security device that monitors and filters incoming and outgoing network traffic based on an organization's previously established security policies. A firewall is essentially the barrier that sits between a private internal network and the public Internet.

**47. (d)**

1 : 2 one is the reducing scale.

- For full size scale representative factor =1.
- For reduces scale, representative factor < 1.
- For enlarged scale representative factor > 1.

**Note –** If we reduce the actual length of an object, so as to accommodate that object on drawing. Than scale used is called reducing scale.

**Reducing scale:-**

When the dimension on the drawing are smaller than the actual dimensions of the object. It is represented by the scale and RF as scale:

1 cm = 100 cm or 1 : 100 and by

RF = 1/100 Less than one.

**48. (b)**

In a technical drawing a mix of vertical and sloping and sloping letters can be not used.

**49. (a)**

Roman lettering is used in engineering drawing.

- The lettering in which all the lettering are formed by thick and thin elements in called Roman lettering.

**ABCDE** Roman lettering

- It may be vertical or inclined.

**50. (c)**

The binary representation of 32 is 100000. A binary number is number expressed in the base - 2 numeral system or binary numeral system, a method of mathematical expression which uses only two symbols : '0' and "1".

# PRACTICE SET - 2

**1. Which of the following best describes the software term?**
(a) Application Program only
(b) Operating System Program only
(c) Control System
(d) Both (a) and (b)

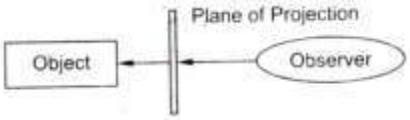
**2. A software user interface feature that allows the user to view anything with the end result when the document is being prepared –**
(a) Format builder (b) Format fidelity
(c) WYSIWYG (d) WYGYWAS

**3. What is the range of electric current causes a heart condition which results in instant death?**
(a) 10-20 mA (b) 50-100 mA
(c) 100-110 mA (d) 20-50 mA

**4. The net resistance of two resistors $R_1$ and $R_2$ connected in series is 8 ohm and their net resistance in parallel is 2 ohm. What are the values of individual resistances $R_1$ and $R_2$, respectively?**
(a) 8 ohm; 0 ohm (b) 4 ohm; 4 ohm
(c) 6 ohm; 2 ohm (d) 2 ohm; 6 ohm

**5. Three resistors of 9Ω each are connected in parallel. Their equivalent resistance is:**
(a) 27Ω (b) 9Ω
(c) 18Ω (d) 3Ω

**6. The figure given below shows the system of _____ projections :**




(a) 1st angle (b) 3rd angle
(c) 4th angle (d) Both (a) and (b)

**7. To make it possible to draw the two views (plan and elevation) in one plane i.e. the plane of the drawing paper, the plane is assumed to be unfolded through 90° in ..... direction.**
(a) Vertical, anticlockwise
(b) Vertical, clockwise
(c) Horizontal, clockwise
(d) Horizontal, anticlockwise

**8. The ratio of the length in the drawing to its corresponding length of an object, when both the lengths are in same unit is called_____.**
(a) Ratio (b) Proportion
(c) RF (d) Fraction

**9. A metallic wire of resistance 100 Ω is bent into a circle having circumference equal to the length of the wire. The equivalent resistance between two diametrically opposite points of the circle is:**
(a) 100Ω (b) 75Ω
(c) 50Ω (d) 25Ω

**10. The Rio Declaration on Environment and Development was approved by the United Nations in the year:**
(a) 1992 (b) 2018
(c) 2002 (d) 2012

**11. The United Nations Conference on Environment and Development (UNCED) that was held in Brazil in 1992 is known as:**
(a) N S Summit (b) Earth Summit
(c) G-20 Summit (d) BRICS Summit

**12. The ratio of load lifted to effort applied is known as :**
(a) Velocity ratio
(b) Mechanical advantage
(c) Efficiency
(d) Input

**13. _____ is a branch of mechanics in which the force causing the motion is taken into account.**
(a) Rigid - body mechanics
(b) Solid mechanics
(c) Kinematics
(d) Dynamics

**14. In Microsoft Excel, a workbook is a collection of:**
(a) charts (b) photos
(c) worksheets (d) word books

**15. Which of the following is/are an example of utility program?**
(a) All of the options
(b) Antivirus software
(c) Network Managers (d) File Compression

**16. The SI unit of …… is ohm?**
(a) electric current (b) voltage
(c) electric charge (d) resistance

**17. A regular dodecahedron has twelve identical ___ faces.**
(a) Pentagonal (b) Quadrilateral
(c) Hexagonal (d) Triangular

**18. Which of the following solids does not have even a single plane surface?**
(a) Pyramid (b) Tetrahedron
(c) Prism (d) Sphere

**19. The number of drawings in any engineering discipline is_____.**
(a) fixed
(b) not fixed
(c) need-based
(d) according to BIS

**20. If a 50 W bulb consumes 1000 J of energy, then the time taken by the bulb is?**
(a) 10 s (b) 100 s
(c) 1 s (d) 20 s

**21.** **A current of 0.5 A flows through the resistor in the circuit and have a voltage source with 6 V. The power supplied to the resistance by the source will be ———.**
(a) 1.0 W (b) 1.5 W
(c) 0.5 W (d) 3.0 W

**22.** **Which instrument is used to measure electric current?**
(a) potentiometer (b) galvanometer
(c) ammeter (d) voltmeter

**23.** **. . . commonly used in electro-heating devices.**
(a) nichrome (b) copper
(c) iron (d) aluminum

**24.** **On what basis can the definition of force be interpreted?**
(a) Newton's second law of motion
(b) Newton's first law of motion
(c) Newton's third law of motion
(d) Newton's law of gravity

**25.** **At any moment, the acceleration of a rocket is proportional to the $n^{th}$ power of the velocity of the released gases. The value of 'n' should be–**
(a) 1 (b) 2
(c) –1 (d) –2

**26.** **10 N force is working on an object. Object displaced 5m in the direction of applied force, then work done is -**
(a) 50N (b) -50N
(c) 50J (d) -50J

**27.** **If force F=0, then work done W = ?**
(a) 20 (b) 0
(c) 1 (d) 100

**28.** **1 horse power is equal to -**
(a) 764 watt (b) 768 watt
(c) 746 watt (d) 786 watt

**29.** **Sources of energy that have been stored in nature for a very long time and when exhausted, cannot be quickly replaced.**
(a) Renewable source of energy
(b) Non-renewable sources of energy
(c) Solar energy
(d) Good sources of energy

**30.** **Which of the following is not a renewable source of energy?**
(a) Solar (b) Wind
(c) Sea Wave (d) Coal

**31.** **1 Diopter is equal to –**
(a) 1 $mm^{-1}$ (b) 1 $m^{-1}$
(c) 1 $dm^{-1}$ (d) 1 $cm^{-1}$

**32.** **What is a quadrilateral with equal sides and none of its angles at right angles called?**
(a) Rectangle (b) Rhombus
(c) Square (d) Parallelogram

**33.** **The primary unit of measurement for engineering drawing and design in the mechanical industry is_____.**
(a) Metre (b) Mtrs.
(c) Milimetre (d) Centrimetre

**34.** **What is the maximum number of auxiliary views of any given object ?**
(a) Infinite (b) 6
(c) 1 (d) 3

**35.** **With respect to the equations of motion, which of the following is incorrect?**
(a) $2as = u^2 - v^2$ (b) $s = ut + \frac{1}{2}at^2$
(c) $2as = v^2 - u^2$ (d) $v = u + at$

**36.** **A computer on the Internet is identified by:**
(a) E-mail address of the owner
(b) IP address
(c) Cryptographic code
(d) Password

**37.** **In which year was the World Wide Web invented?**
(a) 1989 (b) 1987
(c) 1986 (d) 1988

**38.** **Projection of an object shown by three views is known as–**
(a) Perspective (b) Isometric
(c) Oblique (d) Orthographic

**39.** **Which number in the side view in given Fig. shows the surface 'X'.**
(a) 1 (b) 2
(c) 3 (d) 4

**40.** **Chemical engineering (process engineering drawings) are generally**
(a) Flow diagrams
(b) Contain arrows for directions for flow of liquids/gas slurry
(c) Contain symbols
(d) All of these

**41.** **If a car at rest accelerates uniformly to a speed of 144 km / h in 20 seconds, then it covers a distance of-**
(a) 400 m (b) 280 m
(c) 800 m (d) 200 m

**42.** **An object of 10kg is moving at a speed of 5m/s. what will be the kinetic energy of object?**
(a) 125J (b) 2J
(c) 25J (d) 50J

**43.** **The sign for 'smoking is prohibited' is**
(a) 
(b) 
(c) 
(d) None of the above

**44. Identify the displayed sign.**

(a) Warning sign (b) Mandatory sign
(c) Prohibitive sign (d) Informative sign

**45. Which of the following scientists has given a law governing the force of attraction / repulsion between two charged particles?**
(a) Charles Dufay (b) Michael Faraday
(c) Archimedes (d) Charles Coulomb

**46. Electric field strength of charge -**
(a) increases with distance
(b) decreases with cube of distance
(c) decreases with distance
(d) decreases with square of distance

**47. In the field of computers and Internet, what does W3C stand for?**
(a) World Wide Web Consortium
(b) World Wide Web Commission
(c) World Wide Web Centre
(d) World Wide Web Content

**48. In Computer field, what does LIFO stand for?**
(a) Left-In-First-Out (b) Last-In-Finish-Out
(c) Last-In-First-Out (d) Lost-In-First-Out

**49. Just before hitting the earth, the kinetic energy of an object of mass 2 kg is 400 J. At which height it was dropped?**
(a) 10m (b) 25m
(c) 20m (d) 15m

**50. ____is a manufacturer of rock gardens in Chandigarh?**
(a) Nek Chand (b) Gulab Chand
(c) Premchand (d) Mahesh Chand

# SOLUTION : PRACTICE SET- 2

## ANSWER KEY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1. (d)** | **6. (b)** | **11. (b)** | **16. (d)** | **21. (d)** | **26. (c)** | **31. (b)** | **36. (b)** | **41. (a)** | **46. (d)** |
| **2. (c)** | **7. (c)** | **12. (b)** | **17. (a)** | **22. (c)** | **27. (b)** | **32. (b)** | **37. (a)** | **42. (a)** | **47. (a)** |
| **3. (a)** | **8. (c)** | **13. (d)** | **18. (d)** | **23. (a)** | **28. (c)** | **33. (c)** | **38. (d)** | **43. (a)** | **48. (c)** |
| **4. (b)** | **9. (d)** | **14. (c)** | **19. (c)** | **24. (b)** | **29. (b)** | **34. (a)** | **39. (d)** | **44. (a)** | **49. (c)** |
| **5. (d)** | **10. (a)** | **15. (a)** | **20. (d)** | **25. (a)** | **30. (d)** | **35. (a)** | **40. (d)** | **45. (d)** | **50. (a)** |

## SOLUTION

**1. (d)**
Software is a set of instructions, data or programs used to operate computers and execute specific tasks. Examples of applications include office suites, database programs, web browsers, word processors, software development tools, image editors and communication platforms.

**2. (c)**
In computing, What You See Is What You Get (WYSIWYG) is a system where editing software allows content to be edited in a form that resembles its appearance when printed or displayed as a finished product, such as a printed document, web page, or slide presentation.

**3. (a)**

| Current | Effect of its |
|---|---|
| 1 to 8 mA | It gives a feeling of shock, but it is not painful that is man can bear it. |
| 8-15 mA | It gives a painful shock, but the control of the nervous, nervous persists, there fore its tolerance do human personality dependent. |
| 15-20 mA | It gives a painful shock, muscle control of the related nerve is not maintained lives, so humans can't bear it can and dies instantly. |

**4. (b)**

$R_1 + R_2 = 8$ (Resistance in series)

$\frac{1}{R_1} + \frac{1}{R_2} = 2$ (Resistance in parallel)

On solving these two equation, we will get,

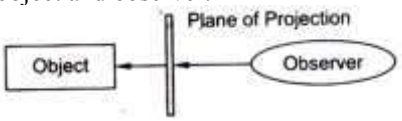
$\Rightarrow$ $R_1 = 4$ ohm & $R_2 = 4$ ohm.

**5. (d)**
Three resistors in parallel arrangement–

$$\frac{1}{R_{equivalent}} = \frac{1}{R_1} + \frac{1}{R_3} = \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \frac{3}{9}$$

$R = 3\Omega$

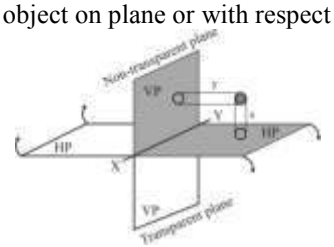
**6. (b)**
The figure given in question shows the system of 3rd angle of projections, because the plane of projection is between object and observer.



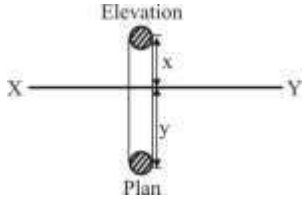

- In this projection system, projections of an object are drawn same to the viewer side.
- This system is used in U.S.A.

**7. (c)**
To make it possible to draw the two views (plan and elevation) in one plane (i.e. the plane of drawing paper), the horizontal plane (HP) is assumed to be unfolded through $90^o$ in clockwise direction.

• Position of object on plane or with respect to plane–



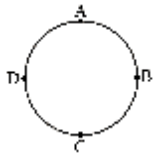

• When draw the projection of object on drawing sheet, H.P. is unfolded in clockwise direction and it comes above X-Y line or below X-Y line.




**8. (c) Representative factor–**
It is the ratio of the length of the element on the drawing to the actual length of the element.

$$RF = \frac{\text{length of the object in drawing}}{\text{Actual length of the object}}$$

**9. (d)**
The resistance of each branch = 50Ω




For diametrically opposite points B and D resistance of each branch is 50Ω and they are connected in parallel.
So, the equivalent resistance,

$$\frac{1}{R} = \frac{1}{50} + \frac{1}{50}$$

$$= \frac{2}{50}$$

$$R = \frac{50}{2} = 25\Omega$$

**10. (a)**
The Rio Declaration on Environment and Development was approved by the United Nations in the year 1992. This Convention was organized in Rio de Janeiro, Brazil. It was also known as 'Earth Convention'. Agenda-21 was also passed during this Convention.

**11. (**b**)**
The United Nations Framework Convention on Climate Change (UNFCCC), signed in 1992 at the United Nations Conference on Environment and Development also known as the Earth Summit, the Rio Summit or the Rio Conference. The UNFCCC entered into force on March 21, 1994 and has been ratified by 197 countries.

**12. (b)**
**Mechanical advantage**–is a measure of the force amplification achieved by using a tool, mechanical device or machine system. The device preserves the input power and simply trades off input forces against movement to obtain a desired amplification in the output force.

$$\text{Mechanical Advantage (MA)} = \frac{\text{load}(W)}{\text{effort}(P)}$$

$$\text{Velocity ratio (VR)} = \frac{\text{Distance moved by the effect}}{\text{Distance moved by the load}}$$

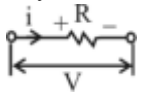
$$\boxed{VR = \frac{Y}{X}}$$

**13. (d)**
The Dynamics is that branch of engineering mechanics which deals with the forces and their effects while acting upon the bodies in motion.

**14. (c)**
Excel file which is also known as workbook consists of one or many spreadsheets or workbook. Every box of worksheet is known as cell. On the top edge of worksheet the letters from A to Z make column reference.

**15. (a)** Several types of utility software are as follows. (i) Antivirus (ii) Disk Management tools (iii) Network Managers.

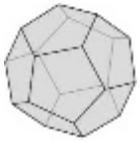
**16. (d)** The SI unit of resistance is Ohm. The elements which resist to flow of current in a circuit is called resistance. It is given by



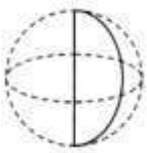

$$\boxed{R = \frac{V}{I}}$$

where, V = voltage across the resistor
I = current through the resistor

**17. (a)**
A regular dodecahedron has twelve identical pentagonal faces.



**18. (d)**
A sphere is a three dimensional object that is round in shape.
- A sphere does not have any plane surface.
- A sphere does not have any edges or vertices, like other 3D shapes or solids.



**19. (c)** The number of drawings in any engineering discipline is need-based.

**20. (d)** P = 50 Watt
E = 1000 Joules
t = ?
Power = energy/time

$$50 = \frac{1000}{t}$$

t = 20 seconds

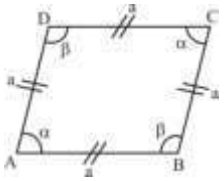
**21. (d)**
Given, $I_1 = 0.5$ A, $V = 6$ V, Power (P) = ?
we know that $P = VI$

$$P = 6 \times 0.5 \Rightarrow \boxed{P = 3\,\text{watt}}$$

**22. (c)**
See the explanation of above question.
**23. (a)**
Generally, nichrome is used in electro-heating devices because its melting point is the maximum and a alloy made of a mixture of nichrome-nickel, chromium and iron. It is used to make resistive wire.
**24. (b)**
**Newtons' First Law of Motion–** Anybody at rest or in uniform motion will remains at rest or in uniform motion unless an external force is applied to change that state. On basis Newton's first law of motion the definition of force be interpreted.
**25. (a)**
Solid or liquid fuel is ignited in the presence of oxygen in a chamber within the rocket. Which produces gas at high pressure. This gas flows backwards with rapid velocity.
Thus, the speed of the escaping gas is in the opposite direction as the speed of the rocket.
At any moment, the acceleration of a rocket is proportional to the $n^{th}$ power of the velocity of the released gases. The value of 'n' should be 1.
Rocket speed $\propto$ (gas speed)$^n$
where n = 1
**26. (c)**
Given, Force (F) = 10 N, Displacement (d) = 5 m
Work = force × displacement in the direction of force
$= 10 \times 5 = 50$J
**27. (b)**
Given, Force = 0, Work done = ?
$W = F.d$
$= 0.d$
$= 0$
**28. (c)**
The electrical equivalent of one horsepower is 746 watts in the International System of Unit (SI) or one horse power is equal to the 746 Joule per sec.
**29. (b)**
Non-renewable resources are those which have a limited stock. Once the stocks are exhausted it may take thousands of years to be renewed or replenished. Examples coal, petroleum and natural gas.
**30. (d)**
Renewable energy includes all the energy which has no polluting factor and whose source does not decay or whose source is replenished. Solar energy, wind energy, hydropower energy, tidal energy, biomass bio fuels etc. are examples of renewable energy. Whereas coal is not a renewable source of energy.
**31. (b)**
• 1 diopter of power of a lens is described as the unit of measurement of the optical power of a lens which is equal to reciprocal of the focal length (f), measured in meter.
• The SI unit of power of lens is diopter whose focal length is one meter, which is denoted by the letter 'D'.

$$1 \text{ diopter (d)} = \frac{1}{f(\text{meter})} = \frac{1}{(\text{meter})}$$
$$= 1\text{m}^{-1}$$

where, (f) = focal length
**32. (b)**
A quadrilateral with equal sides and none of its angles at right angles called rhombus.




•All sides of the rhombus are equal.
• The opposite sides of a rhombus are parallel.
•Opposite angles of a rhombus are equal.
• In a rhombus diagonal bisects each other at right angles.
• The sum of two adjacent angles is equal to 180°.
**33. (c)**
Milimetre is a primary unit of measurement for engineering drawing and design in the mechanical industry.
**34. (a)**
Any given object has an infinite number of auxiliary views.
• Sometimes two view of an object (front view & top view) are not sufficient to convey all information regarding to the object.
• In this condition the additional view called auxiliary view and projected on that plane known as auxiliary plane.
**Auxiliary view may also be used for determining:**
(a) The true length of a line
(b) The point view of a line
(c) The side view of a line
(d) The true size and shape of a plane.
**35. (a)**
The established relation between the velocity, acceleration, time and distance travelled of an object is called the equation of motion. These are mainly of three types.
(1) $v = u + at \rightarrow$Velocity-time relation
(2) $s = ut + \frac{1}{2}at^2 \rightarrow$Position-time relation
(3) $2as = v^2 - u^2 \rightarrow$Position velocity relation
Where u = initial velocity, a = acceleration
v = final velocity , s = displacement and t = time
**36. (b)**
A computer on internet is identified by the IP address. IP address is a unique address that identifies a device on the internet or a local network. IP stands for Internet Protocol.

**37. (a)**
English scientist Tim Berners-Lee co-invented the World Wide Web in 1989 along with Robert Cailliau while working at CERN. The World Wide Web (WWW), commonly known as the Web, is an information system where documents and other web resources are identified by Uniform Resource Locators which may be interlinked by hyperlinks, and are accessible over the Internet.

**38. (d)**
An orthographic projection is a way of representing a 3D object by using multiple 2D views of the object. Hence this drawing methods are also known as multi views projections.

- So the projection of an object shown by three views is known as orthographic.

**39. (d)**
From the given, isometric view, 'X' surface of this object is shown by '4' in side view.

**40. (d)** Chemical engineering are generally–
(a) Flow diagrams
(b) Contain arrows for directions for flow of liquids/gas slurry.
(c) Contain symbols.

**41. (a)** From first equation of motion,
$v = u + at \ \because u = 0$
here, v = 144 km/hour

$$= 144 \times \frac{5}{18} \text{ m/sec}$$

$$v = 0 + a \times 20$$

$$144 \times \frac{5}{18} = a \times 20$$

$$20 \times a = 40$$

$$a = 2 \text{ m/s}^2$$

$$\therefore s = ut + \frac{1}{2}at^2$$

$$s = 0 + \frac{1}{2} \times (2) \times (20)^2$$

$$= \frac{1}{2} \times (2) \times 400$$

$$s = 400 \text{ meters}$$

**42. (a)** Kinetic energy is directly proportional to the mass of the object and to the square of its velocity.

$$\text{K.E.} = \frac{1}{2}mv^2$$

here, m = 10 kg, v = 5 m/s

$$\text{Kinetic energy} = \frac{1}{2} \times 10 \times (5)^2 = 5 \times 25 = 125 \text{ Joule}$$

**43. (a)** This sign for 'smoking is prohibited'

**44. (a)** The displayed sign represent warning sign.

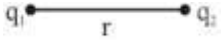
This symbol represents the risk of explosion.

**45. (d)**
According to Coulomb's law, the force of attraction or repulsion between two point charges is directly proportional to the product of the magnitude ($q_1q_2$) of the two charges and inversely proportional to the square of the distance ($r^2$) between them, Mathematically.

$$F = K\frac{q_1q_2}{r^2}$$

The value of K depends on the nature of the medium between the two charges.
For charges in vacuum, $K = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$.

**46. (d)**
According to Coulomb's law -
(I) The force between two charges $q_1$ and $q_2$ is directly proportional to the product of the magnitude of both charges.
(II) The distance between charges is inversely proportional to the square of distance ($r^2$) between them.
(III) depends on the medium between charges.




Mathematically,

$$F = K\frac{q_1q_2}{r^2}$$

The value of K depends on the nature of the medium between the two charges. Hence electric field strength of charge decreases with square of distance.
For charges in vacuum, $K = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$.

**47. (a)**
In the field of computer and Internet W3C stands for World Wide Web Consortium.

**48. (c)**
LIFO (Last In First Out) is a method for handling data structure where the first elements is processed last and the last element is processed first. LIFO used in Data structures and Extracting latest Information.

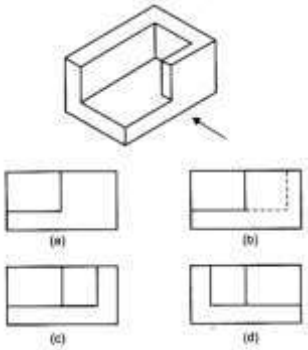
**49. (c)**
From conservation of energy,
Kinetic energy of body before striking (hitting) the ground = potential energy of body at height h from the ground, P.E. = mgh
here, m = 2 kg, P.E = 400 J & $g = 10 \text{ m/s}^2$
400 = mgh
$400 = 2 \times 10 \times h$
$\Rightarrow h = 20$ m.

**50. (a)**
Rock Garden was built by Nekchand Saini in Chandigarh. This garden is located near Sukhna Lake. In 1984, Nekchand Saini was awarded the 'Padma Shri' award by the Government of India. He died in the year 2015.

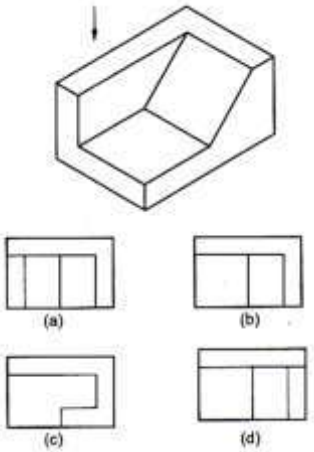
# PRACTICE SET - 3

**1. A bus starts from a rest and descends from hill with uniform acceleration. If it covers a distance of 200m in 10 sec, what is its acceleration?**
(a) 4 $m/s^2$ (b) 6 $m/s^2$
(c) 8 $m/s^2$ (d) 2 $m/s^2$

**2. Identify the front view as per arrow in the isometric view of the object in the Fig.**




**3. Identify the correct top view as per arrow in the isometric view of the object in the Fig.**




**4. An object with a mass of 1kg is moving towards east with a uniform velocity of 2m/s. A force of 1.5 N is applied on this towards the north. Find the value of displacement of the object after 2 seconds.**
(a) 7 m (b) 4 m
(c) -5 m (d) 3 m

**5. The process of separating cream from the milk used in dairy is called -**
(a) decantation (b) partial distillation
(c) centrifugation (d) crystallization

**6. When an object produces uniform circular velocity, which of the following changes?**
(a) mass (b) momentum
(c) speed (d) direction

**7. A company often uses specific item in its drawings and generates a standard drawing for this item and this standard drawing is referred to in its other related drawings. This standard drawing is known as_____.**
(a) BIS drawing
(b) ISO standard drawing
(c) Company standard drawing
(d) Interchangeable drawing

**8. The ratio of the shorter side of an A4 sheet to the longer side of an A3 sheet is _____ . /A4**
(a) 1 : 1 (b) $1:\sqrt{2}$
(c) 1 : 4 (d) 1 : 2

**9. Identify the method of artificial respiration shown in the figure.**

(a) Labord method
(b) Silvester's method
(c) Schafer's method
(d) Mouth to mouth method

**10. Machine language –**
(a) Is the one in which the first programs were written
(b) Is the only language that a computer understands
(c) One type of computer language which isdifferent from another type of computer language.
(d) All of these

**11. Which organization has established Govardhan Eco Village in Maharashtra?**
(a) Ish Foundation (b) RSS
(c) Gowdia Math (d) ISKCON

**12. Environmental pressures at sea level are ..... Pa.**
(a) 0 (b) 0.1
(c) 1 (d) 0.001.

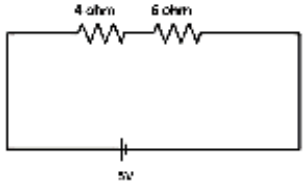
**13. In a computer, assembler is –**
(a) A program that prepares the program in memory to operate it.
(b) A program that mechanically translates the assembly language into machine.
(c) A program that accepts a program written in higher language and creates an object program.
(d) A program that appears to operate the source program, ex- a machine language.

**14. If a capacitor stores 1 coulomb at 10 volts, its capacitance will be (F = Farad):**
(a) 1F (b) 10 F
(c) 0.1 F (d) 0.01 F

**15. The velocity of a moving body, is**

(a) a vector quantity (b) a scalar quantity
(c) a constant quantity (d) none of these

**16. The potential drop across the 4Ω resistor in the given circuit is :**




(a) 2 V (b) 5 V
(c) 3 V (d) 0.5 V

**17. If the resistance of the conductor is doubled then the electric current is halved. What causes this:**

(a) $I = V - R$ (b) $I = \frac{V}{R}$

(c) $I = \frac{R}{V}n$ (d) $I = VR$

**18. What is the extension of PDA?**

(a) Personal Data Assistant
(b) Personal Digital Assistant
(c) Prime Data Assistant
(d) Prime Digital Assistant

**19. An arrowhead at the end of a dimension line is approximately——— long and 1 mm wide.**

(a) 1.5mm (b) 5mm
(c) 3mm (d) 1mm

**20. The International practice for lettering on technical drawings is to use _____ lettering and numerals.**

(a) English (b) Roman
(c) French (d) ISO

**21. Mechanical engineering drawings generally consist of_____.**

(a) Equipment foundation drawings
(b) Mechanical component drawings
(c) Electrical connection
(d) (a) and (b)

**22. ICT is abbreviated as –**

(a) International Communication Technology
(b) Intelligent Communication Technology
(c) Inter-State Communication Technology
(d) Information Communication Technology

**23. Who discovered the relation between Potential difference (V) and Electric current (I)?**

(a) Newton (b) Ohm
(c) Pascal (d) Tesla

**24. Which of the following formulae does not represent the heat produced in a conductor due to flow of electric current?**

(a) $H = \frac{V^2}{R}t$ (b) $H = IR^2t$

(c) $H = I^2Rt$ (d) $H = VIt$

**25. Ozone is found in two regions of the Earth's atmosphere – at the ground level and in the upper regions of the atmosphere. While the upper atmosphere ozone protects the Earth from the sun's harmful rays, ozone at the ground level is the main component of the –**

(a) Methane
(b) Smog
(c) Lead
(d) Sulphur oxide

**26. _____engineering drawings for manufacture are heavily dimensional referenced drawing.**

(a) Electrical
(b) mechanical
(c) Electronic
(d) All of (a), (b) and (c)

**27. Which of the following is the approximate ratio of length to width of any standard Engineering drawing sheet ?**

(a) $1:\sqrt{2}$ (b) $3:\sqrt{3}$
(c) $1:\sqrt{3}$ (d) $2:\sqrt{3}$

**28. Engineering drawings are generally made in landscape position for the ease is:**

(a) Fixing the drawing sheet on the board
(b) Reading the drawing
(c) Dimensioning the drawing
(d) Microfilming the drawing

**29. An electric heater is rated 2200W at 220 V. The minimum rating of the fuse wire to be connected to the device is:**

(a) 20 A (b) 5 A
(c) 10 A (d) 22 A

**30. How long a rescue breath need to be?**

(a) Delivered over 2 seconds
(b) Delivered over 1 seconds
(c) Long enough to make the chest rise
(d) A small puff of air

**31. Three resistors of 4Ω, 8Ω and 6Ω are connected in parallel combination with a 9V battery. The total current drawn from the battery is :**

(a) 6.4 A (b) 4.8 A
(c) 8.4 A (d) 4.2 A

**32. The part of an electric motor that reverses the direction of flow of current in it, is:**

(a) coil (b) soft iron core
(c) split ring (d) brush

**33. The Forest Festival was started in the year 1950 to create awareness among people for conservation of forests and planting of new trees was started by –**

(a) Jawahar Lal Nehru
(b) K.M.Munshi
(c) Sardar Vallabhbhai Patel
(d) Narhar Vishnu Godgill

**34. Which of the following is NOT a part of the hardware of a computer?**
(a) Monitor (b) Keyboard
(c) CPU (d) Microsoft Office

**35. Which of the following are the two components of the CPU of a computer ?**
(a) ALU and Bus
(b) Control unit and ALU
(c) Control unit and Bus
(d) Registers and Main memory

**36. India's first Genetic Bank for Wildlife Conservation is located at:**
(a) Cochin (b) Hyderabad
(c) Bengaluru (d) Ahmedabad

**37. Which species are not classified in the IUCN endangered species category?**
(a) Harmful
(b) Extinct
(c) Easily injured (Vulnerable)
(d) Endangered

**38. Which of the following statements is/are true for a number of resistors connected in parallel combination?**
**i. All the resistors are connected between two given points.**
**ii. The equivalent resistance of the circuit is more than the individual resistance.**
**iii. The potential difference across each resistor is same.**
(a) Only iii (b) Both i and iii
(c) Only i (d) Both i and ii

**39. Consider two circuits, A and B, each of which has six resistors and each Circuit of resistance $R_A$ and $R_B$ respectively. In each circuit, the resistors are in such a way that the net resistance of each circuit is the minimum. Now a 20 V battery with negligible internal resistance is connected across each circuit separately, and current drawn by circuit A and circuit B are 6 A and 8 A, respectively. Then $R_A$ and $R_B$ will be :**
(a) $R_A = 15\ \Omega$ and $R_B = 20\Omega$
(b) $R_A = 20\ \Omega$ and $R_B = 15\Omega$
(c) $R_A = 30\ \Omega$ and $R_B = 15\Omega$
(d) $R_A = 15\ \Omega$ and $R_B = 30\Omega$

**40. The efficiency of screw Jack may be increased by :**
(a) Increasing its pitch
(b) Decreasing its pitch
(c) Increasing the load to be lifted
(d) Decreasing the load to be lifted

**41. According to SP 46 : 2003, the lines can be divided into two groups of line thickness these are : _____mm.**
(a) 0.2, 0.1 (b) 0.3, 0.2
(c) 0.4. 0.2 (d) 1, 0.1

**42. A wire with a resistance of 12 Ω is doubled its radius. Calculate the new resistance of the wire.**
(a) 2.25 Ω (b) 1.25 Ω
(c) 1.00 Ω (d) 3.0 Ω

**43. With respect to water pollution, BOD means –**
(a) Biochemical dilution
(b) Biochemical oxygen demand
(c) Bio – organic solutes
(d) Basic bio- organic solute

**44. In an electric generator, _____ energy is used to rotate a conductor in a _____ field to produce electricity**
(a) mechanical, magnetic
(b) mechanical, electric
(c) electrical, magnetic
(d) electrical, electric

**45. A 1100 W electric toaster operates at 220 V. The resistance of its coil is :**
(a) 11 Ω (b) 88 Ω
(c) 22 Ω (d) 44 Ω

**46. In Gmail, the email address of the recipients can be entered in ____ field.**
(a) Subject (b) To
(c) From (d) Message

**47. Findout the odd statement regarding Firewall.**
(a) Firewall can be software.
(b) Firewall can be hardware.
(c) A firewall can be a combination of hardware and software.
(d) Firewall protects computers from fire.

**48. In order to prevent accidents caused by dangerous electric current and damage caused by shocked, what is mainly needed to provide an extinguishing alternate path to this flow of electric current?**
(a) Resistance (b) Earthing
(c) Ammeter (d) Diode

**49. When a cork and a iron nail are placed in a beaker filled with water, the cork floats while the iron nail is submerged.**
**What is the reason behind it?**
(a) The density of cork is greater than the density of water
(b) The density of iron nail is more than the density of water
(c) Mass of iron nail is greater than mass of cork
(d) Mass of cork is greater than mass of iron nail

**50. What would be the force generated by a wall on which water strike normally at a speed of 10 m/s and at a discharge of 0.0001 $m^3$/sec?**
(a) 1 Newton (b) 0.1 Newton
(c) 10 Newton (d) 100 Newton

# SOLUTION : PRACTICE SET- 3

## ANSWER KEY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1. (a)** | **6. (d)** | **11. (d)** | **16. (a)** | **21. (a)** | **26. (b)** | **31. (b)** | **36. (b)** | **41. (a)** | **46. (b)** |
| **2. (b)** | **7. (c)** | **12. (c)** | **17. (b)** | **22. (d)** | **27. (a)** | **32. (c)** | **37. (a)** | **42. (d)** | **47. (c)** |
| **3. (b)** | **8. (d)** | **13. (b)** | **18. (b)** | **23. (b)** | **28. (b)** | **33. (b)** | **38. (b)** | **43. (b)** | **48. (b)** |
| **4. (a)** | **9. (c)** | **14. (c)** | **19. (c)** | **24. (b)** | **29. (c)** | **34. (d)** | **39. (b)** | **44. (a)** | **49. (b)** |
| **5. (c)** | **10. (b)** | **15. (a)** | **20. (a)** | **25. (b)** | **30. (c)** | **35. (b)** | **40. (a)** | **45. (d)** | **50. (a)** |

## SOLUTION

**1. (a)** According to the second equation of motion,

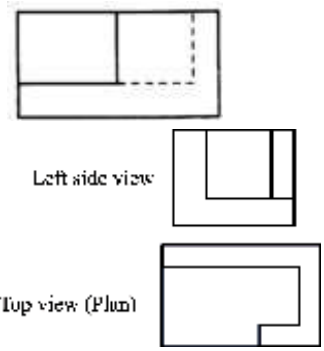
$$S = ut + \frac{1}{2}at^2$$

$$200 = 0 \times 10 + \frac{1}{2} \times a \times 10^2$$

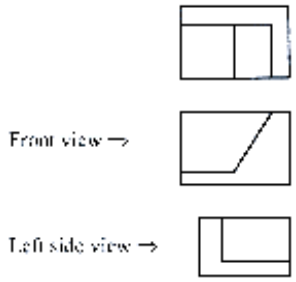
$$200 = \frac{1}{2} \times a \times 100$$

$$a = \frac{200}{50} = 4\ m/s^2$$

**2. (b)** Front view as per arrow in the isometric view of the object in the figure–




**3. (b)** Top view as per arrow in the isometric view of the object in the figure–




**4. (a)** mass (m) = 1 kg

force, F = 1.5 N

velocity, v = 2 m/sec

time, t = 2 sec

displacement, (s) = ?

F = m.a

1.5 = 1.a

a = 1.5 m/sec$^2$

displacement (s) = $ut + \frac{1}{2}at^2$

$$s = 2 \times 2 + \frac{1}{2} \times 1.5 \times 2^2$$

s = 4 + 3 = 7m

**5. (c)**

Centrifugal force is a force that arises from the body's inertia and appears to act on a body that is moving in a circular path which is directed away from the centre around which the body is moving.

Example -

(i) A bike making a turn.

(ii) The devices that separate cream from milk work on this principle.

**6. (d)**

The direction of the velocity is directed in the same direction that the object moves. Since an object moving in uniform circular motion the perimeter of the circle with a constant speed, but its direction is continuously changing. Its direction is always tangent to the circle.

Example - Such as the movement of the Earth around the Sun, the movement of the electron around the nucleus, etc.

**7. (c)**

A company often uses specific item in its drawing and generates a standard drawing for this item and this standard drawing is referred to in its other related drawings.

This standard drawing is known as– company standard drawing.

**8. (d)**

The ratio of the shorter side of A4 sheet to longer side of an $A_3$ sheet is 1 : 2.

1. The shorter side of an A4 sheet ($S_4$) = 210mm

and, the longer side of an A3 sheet ($L_3$) = 420mm

Then,

The ratio of shorter size of $A_4$ sheet to the longer size of $A_3$ sheet is -

$$\frac{S_4}{L_3} = \frac{210}{420} = \frac{1}{2}$$

$S_4:L_3 = 1:2$

**9. (c)**

Schafer's method is artificial respiration method shown in the figure.

**10. (b)**

Machine code is a computer program written in machine language instructions that can be executed directly by a computer's central processing unit.

**11. (d)**

Govardhan Eco Village in Maharashtra has been established by ISKCON. It is an environmentally friendly and community-based model village.

**12. (c)**

Atmospheric pressure is the force exerted on a unit of surface in the earths atmosphere by the weight of the air above it. The Environmental weight on the ocean 1 atm.

**13. (b)**

An assembler is a program that converts assembly language into machine code. It takes the basic commands and operations from assembly code and converts them into binary code that can be recognized by a specific type of processor. Assemblers are similar to compilers in that they produce executable code.

**14. (c)**

A capacitor stores 1 coulomb at 10 volts. Then capacitance $(C) = \frac{Q}{V}$

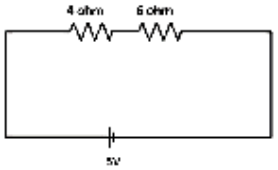
$= 1/10 = 0.1F$

**15. (a)**

The velocity of an object is rate of change of its position with respect to a frame of reference and is a function of time.

It is a vector quantity.

**16. (a)** Given figure




total resistance in the circuit

R= 4 + 6 (as the resistances are connected in series)

= 10 ohm

Voltage applied , V = 5 volt

$\therefore$ Current passing through 4ohm

resistor is $I = \frac{V}{R} = \frac{5}{10} = 0.5\text{amp}$

therefore potential drop across the 4Ω resistor,

**17. (b)** According to Ohm's law,

$V \propto I$

or $V = I.R$

$R = \frac{V}{I} = \text{constant}$ Or $I = \frac{V}{R}$

Therefore, according to Ohm's law, if we doubles the resistance of the conductor, the electric current is halved.

**18. (b)**

Personal Digital Assistant (PDA) also known as handled PC. It is a mobile device that acts as a personal information manager. After widespread adoption of a highly capable Smartphone, (based on IOS and Android) PDA was closed on a large scale in early 2010.

**19. (c)**

An arrowhead at the end of a dimension line is approximately 3 mm long and 1 mm wide.

• Dimension line is used for showing the dimension of an object.

• A dimension line are thin, continuous and straight.

**20. (a)**

The lettering in general is classified in two categories –

• Gothic lettering

• Roman lettering

**21. (a)**

Mechanical engineering drawing generally consist of equipment foundation drawings.

**22. (d)**

Information communication technology is known as ICT.

**23. (b)**

According to Ohm's law, (V = IR) the relation between potential difference or voltage (V) and electric current (I) was discovered by Georj simon Ohm.

**24. (b)**

The heating effect of electric current is due to the resistance that a conductor offers to the current flowing through it and the amount or the strength of the electric current itself.

$H = \frac{v^2}{R}t$ or $I^2Rt$ or VIt

**25. (b)**

Ozone, or tri oxygen, is an inorganic molecule with the chemical formula $O_3$ It is a pale blue gas with a distinctively pungent smell. It is an allotrope of oxygen that is much less stable than the diatomic allotrope $O_2$, breaking down in the lower atmosphere to $O_2$. The mix of sea salt, ship fumes and city smoke leads to a chemical reaction that encourages the formation of ozone smog. This compound is created when nitrogen oxides from ship exhausts and city smoke, mix with aerosol particles containing chloride, such as sea salt spray.

**26. (b)**

Mechanical engineering drawings for manufacture are heavily dimensional referenced drawing.

- Mechanical drawing or drafting, is a technique used to represent a 3D object on a 2D piece of drawing paper.

**27. (a)**

The approximate ratio of length to width of any standard drawing sheet is $1:\sqrt{2}$

For eg. Width of $A_0$ sheet = 841 mm

length = $841 \times \sqrt{2}$ mm = 1189 mm

$$\boxed{\frac{\text{Width}}{\text{Length}} = \frac{1}{\sqrt{2}}}$$

**28. (b)**

Engineering drawings are generally made in landscape position for the lose of reading the drawing.

- Landscape presented to be viewed with the longest side of the sheet horizontal.

**29. (c)**

Given,

P = 2200W

V = 220V

We know that $P = \frac{V^2}{R}$

$$R = \frac{220 \times 220}{2200}$$

R = 22

Again,

According to Ohms law

V = iR

$$i = \frac{V}{R} = \frac{220}{22} = 10A$$

**30. (c)**

A rescue breath need to be long enough to make the chest rise.

**31. (b)**

Given, $R_1 = 4\Omega$, $R_2 = 8\Omega$, $R_3 = 6\Omega$, V = 9V

Net resistors in parallel combination formula;

$$\frac{1}{R} = \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right)$$

$$\frac{1}{R} = \left(\frac{1}{4} + \frac{1}{8} + \frac{1}{6}\right)$$

$$\frac{1}{R} = \left(\frac{6+3+4}{24}\right) = \frac{13}{24}$$

$$\frac{1}{R} = \frac{13}{24}$$

$$R = \frac{24}{13} = 1.84\Omega$$

Ohm's law equation, V= IR

Where V = voltage, I = Current & R = resistance

$$I = \frac{V}{R} = \frac{9}{1.84} = 4.8A$$

Hence, option 4.8A is correct answer.

**32. (c)**

The split ring in the electric motor also known as a commutator, reverses the direction of current flowing through the coil after every half rotation of the coil. Due to help of this device coil continues to rotate in the same direction.

**33. (b)**

Forest Festival is an annual one week tree planting festival in India. It was started in 1950 by Kanaiyalal Maneklal Munshi to encourage Indians to support tree planting and tending, festival organizers hope to create more forest in the country. It would provide alternative fuels, increasing production of food resources, creating shelter-belts around fields to increase productivity, provide food for cattle, offer shade and decorative landscapes, reducing drought and helping to prevent soil erosion.

**34. (d)**

Hardware- The computer device which can be touch by the physically means like Monitor, Keyboard, CPU etc are the hardware devices.

**Software–** Software, instructions that tell a computer what to do like M.S. PowerPoint , MS Excel etc.

**35. (b)**

CPU (Central Processing Unit) is called the brain of the computer. It performs all types of data processing like operation and storage of data, intermediate results and instructions. It controls the operation of all parts of the computer. CPU has three components - (Control Unit, ALU (Arithmetic Logic Unit) Memory Or Storage Unit).

- An Arithmetic Logic Unit (ALU) is a digital circuit used to perform arithmetic and logic operations.
- The control unit is a component of a computer's Central Processing Unit that directs the operation of the processor.
- Memory is basically a device that has the capacity to store information.

**36. (b)**

India's first Genetic Bank for Wildlife Conservation, was inaugurated in Hyderabad. It was inaugurated at Centre for Cellular and Molecular Biology's (CCMB) Laboratory of Conservation of Endangered Species (LACONES) facility in Hyderabad, Telangana.

**37. (a)**

Under the IUCN Red List, Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) Species are considered to be threatened with extinction. The International Union for Conservation of Nature (IUCN) is an international organization working in the field of nature conservation and sustainable of natural resources.

**38. (b)** The following statements are true for a number of resistor connected in parallel combination.

(i) All the resistor are connected between two given points.

(ii) The potential difference across each resistor is same.

**39. (b)**

Given :

| | |
|---|---|
| $V_A = 20$ V<br>$I_A = 6$A | $V_B = 20$V<br>$I_B = 8$A |
| Net $R = \frac{R_A}{6}$<br>$V_A = I_A R$<br>$20 = 6 \times \left(\frac{R_A}{6}\right)$<br>$R_A = \frac{20 \times 6}{6}$<br>$R_A = 20\Omega$ | Net $R = \frac{R_B}{6}$<br>$V_B = I_B R$<br>$20 = \frac{8 \times R_B}{6}$<br>$\frac{20 \times 6}{R_B} = 8$<br>$R_B = \frac{20 \times 6}{8}$<br>$R_B = 15\ \Omega$ |

**40. (a)**

A jack screw or screw jack is a type of jack that is operated by turning a lead screw. It is commonly used to lift moderately heavy weight, such as vehicles; to raise and lower the horizontal stabilizers of aircraft and as adjustable supports for heavy loads such as the foundation of houses.

- Screw jacks are limitations in their lifting capacity increasing load increases it pitch friction within the screw threads. A fine pitch thread, which would increase the advantage of the screw, also reduces the speed of which the jack can operate.

**41. (a)**

According to SP 46 : 2003, the lines can be divided into two groups of line thickness these are 0.2, 0.1.

**42. (d)**

Formula- $R = \rho\frac{l}{A} = \rho\frac{l}{\pi r^2}$

$$12\Omega = \rho\frac{l}{\pi r^2} \qquad \ldots\ldots(i)$$

If the radius of the wire is doubled then the resistance

$(R') = \rho\frac{l}{\pi(2r)^2}$

$= \rho\frac{l}{\pi r^2} \times \frac{l}{4}$ {from equation (i) from}

$= \frac{12}{4} = 3\Omega$

**43. (b)** Biochemical Oxygen Demand (BOD) is the amount of oxygen used during oxidation of biomaterials. In general, water quality is determined on the basis of bio-oxygen demand, chemical oxygen demand, and dissolved oxygen. The amount of oxygen required for metabolic activity in micro organisms in 5 days to one liter of water at normal temperature is called biological oxygen demand. Salmonella is a bacteria responsible for typhoid fever and it is produced in dirty turbid water etc.

**44. (a)**

In an electric generator mechanical energy is used to rotate a conductor in a electric field to produce electricity.

**45. (d)** Given,

Power (P) = 1100 W

Voltage (V) = 220V

As we know that,

$P = V \times I$

So,

$1100 = 220 \times I$

$I = 5$A

Now,

$V = R.I$

$R = 220/5$

$= 44\Omega$

**46. (b)** In Gmail, recipient address address is fill up in 'To' section, to whom we have to sent mail.

**47. (c)**

Firewall is a part of a computer system that is built to prevent unauthorized access and allow authorized communication experience.

**48. (b)**

To provide an alternating route to this flow of extinguishing electric current to prevent accidents used by dangerous electric current and damage caused by electric shocks earthing is mainly required.

**49. (b)**

When a cork and iron nail are placed in a beaker filled with water, the cork floats while the iron nail submerged because the density of the iron nail is greater than the density of the water. So, the cork is floating because density of cork is less than density of water.

**50. (a)** Given, V = 10 m/s

$Q = 1 \times 10^{-4}\ m^3/s$

We know that,

Force (F) = Mass (m) × Gravitational acceleration (g)

[mass (m) = ρAV (V=velocity, A = Area)]

Force (F) = ρAV ×g

$= \rho g\ AV = \rho gQ$ [Discharge (Q) = A ×V]

$= 1000 \times 10 \times 1 \times 10^{-4} = 1$ N

# PRACTICE SET - 4

**1. 0.2, mm thick lines are used for_____.**
(a) Dotted lines (b) Outlines
(c) Cutting planes (d) All of these

**2. Lettering should be so done that can be read from the _____ with the main title _____.**
(a) Front, horizontal
(b) Backwards, horizontal
(c) Top, vertical
(d) None of these

**3. A boy of 50 kg mass climbs 43 stairs in 10 seconds. If the height of each stair is 15cm then find its power ?**
(a) 337.5W (b) 325.5J
(c) 322.5W (d) 322.5ms

**4. The S.I. unit of 'g' is same as –**
(a) Pressure (b) Momentum
(c) Velocity (d) Acceleration

**5. Which class does the symbol shown in the figure belong to–**

(a) Prohibition Sign (b) Warning Sign
(c) Mandatory Sign (d) Information Sign

**6. Which unit is the smallest unit in computer data storage?**
(a) 1 giga byte (b) 1 penta byte
(c) 1 tera byte (d) 1 mega byte

**7. Choose the odd one out-**
(a) Optical disk (b) Magnetic storage
(c) Solid state drive (d) Petabyte

**8. Energy may be defined as**
(a) power of doing work
(b) capacity of doing work
(c) rate of doing work
(d) all the above

**9. The S.I. unit of energy is———**
(a) Erg (b) Calorie
(c) Joule (d) None of these

**10. Two resistors $R_1$ and $R_2$ with resistances 2Ω and 3Ω, respectively, are connected in series to a 15V battery source. The current across $R_2$ (in A) is**
(a) 5 (b) 3
(c) 7.5 (d) 15

**11. There are three pre-requisites for any fire or explosion to take place. Which one of the following is not included in the three pre-requisites?**
(a) Fuel (b) Oxygen
(c) Nitrogen (d) Ignition

**12. A family consumes 320 units of energy in a month. How much is this energy in joules?**
(a) $1152 \times 10^6$ joule (b) $9 \times 10^8$ joule
(c) $10 \times 10^5$ joule (d) $5 \times 10^8$ joule

**13. An electric bulb of 100 W is used for 8 hours each day. The energy used by the bulb in 5 days will be ——— unit.**
(a) 0.4 (b) 400
(c) 4 (d) 40

**14. Which of the following position is no work done?**
(a) Kapil stands with a weight of 10 kg on his shoulder
(b) Sachin walks 4 km.
(c) A porter carries weight from a bus to a car.
(d) Arun plays cricket on the field.

**15. The notation 2 × ϕ6 means _____.**
(a) Scale the circle of diameter 6 units by a factor of 2
(b) 2 circles of radius 6 units
(c) Scale the circle of radius 6 units by a factor of 2
(d) 2 circles of diameter 6 units

**16. Which one is the full scale?**
(a) 5 : 1 (b) 1 : 1
(c) 10 : 1 (d) 1 : 2

**17. Which one is the enlarging scale?**
(a) 5 : 1 (b) 1 : 1
(c) 1 : 20 (d) 1 : 50

**18. The work done by the force is positive when-**
(a) Displacement occurs in the direction of force
(b) Displacement is perpendicular to the force
(c) There is no displacement due to the force
(d) Displacement occurs in opposite direction of force

**19. What is the default alignment of numbers in an Excel worksheet?**
(a) Left (b) Justify
(c) Center (d) Right

**20. Which of the following keyboard shortcuts is used to perform REDO operation in MS-Word?**
(a) Ctrl + R (b) Ctrl + Y
(c) Alt + Z (d) Alt + Y

**21. The global agreement was adopted under special control strategies to reduce the execution of ozone- depleting substances –**
(a) Rio-de Janeiro Conference
(b) Montreal release
(c) Kyoto release
(d) Vienna Conference

**22. What is the potential energy of an object of mass 40 kg when it is lifted at a height of 5m above the ground?**
(a) 200W (b) 2000J
(c) 2000W (d) 200J

**23. During the free falling of an object –**
(a) The kinetic energy increase
(b) The potential energy increase
(c) The kinetic energy decrease
(d) There is no change in kinetic energy

**24. Match the following given lists :**

| COLOUR | SYMBOL TYPE |
|---|---|
| A. Red | 1. Warning |
| B. Yellow | 2. Mandatory |
| C. Blue | 3. Prohibition |
| D. Green | 4. Emergency escape |

(a) A–3, B–1, C–2, D–4
(b) A–1, B–2, C–4, D–3
(c) A–2, B–3, C–4, D–1
(d) A–1, B–2, C–3, D–4

**25. Calculate the acceleration produced when a force of 100 N is applied to an object of mass 50 kg.**
(a) 2 $ms^{-2}$ (b) 2 $ms^{2}$
(c) 0.2 $ms^{2}$ (d) 0.2 $ms^{-2}$

**26. A constant force acts on an object of mass 5 kg for a period of 2 seconds. This increases the velocity of the object from 6 $ms^{-1}$ to 8 $ms^{-1}$. Find the amount of force applied.**
(a) 5 N (b) 8 N
(c) 7 N (d) 4 N

**27. Negative acceleration is opposite to which of the following direction?**
(a) velocity (b) momentum
(c) force (d) distance

**28. Some commonly pictorial drawings used in industry are_____.**
(a) Isometric view (b) perspective view
(c) Oblique view (d) (a) and (c)

**29. The type of pictorial projection generally used by the architects is_____.**
(a) orthographic (b) oblique
(c) Perspective (d) Isometric

**30. Isometric drawings consist of_____.**
(a) Mechanical components
(b) Electrical components
(c) Electronic components
(d) All of (a), (b) and (c)

**31. Till year 2015 ….. which generation computer production has occurred-**
(a) $6^{th}$ (b) $5^{th}$
(c) $4^{th}$ (d) $3^{rd}$

**32. Which of the following cannot be included in greenhouse gases?**
(a) Nitrous oxide (b) Carbon dioxide
(c) Methane (d) Phosphine

**33. If the width of a standard engineering drawing sheet is 841 mm, then its length will be ___mm.**
(a) 1189 (b) 1216
(c) 1000 (d) 1250

**34. What is the full form of the abbreviation AC in an engineering drawing?**
(a) Aerial Cut (b) Across Corners
(c) Attached Circle (d) Air Conditioning

**35. Which is the first Apple computer?**
(a) Apple I (b) Apple II
(c) Macintosh (d) Apple lisa

**36. Which of the following statements is true with respect to a car running at constant acceleration on a straight road with a flat plane?**
(a) The acceleration of the car is zero.
(b) The velocity of the car is zero.
(c) The acceleration of the car is constantly changing.
(d) The velocity of the car is constantly changing.

**37. In a circuit, there are five resistors each of 5 Ω, and they are connected in such a way that the resistance of the circuit is the maximum. Now this circuit is connected to a battery of 15 V. The current flowing through the circuit is:**
(a) 0.4 A (b) 0.9 A
(c) 0.6 A (d) 0.8 A

**38. Which of following biomes is known for its coniferous (cone-bearing evergreen) forests?**
(a) Boreal forest (b) Tropical rain-forest
(c) Savanna Forest (d) Chaparral forest

**39. Which of the following is the biggest Biosphere Reserve of India in terms of geographical area?**
(a) Gulf of Mannar (b) Nanda Devi
(c) Kutch (d) Sunderbans

**40. Two resistors of 6Ω and 4Ω in series combination are connected to a 12 V battery. The effective current of the circuit will be:**
(a) 2 Amp (b) 0.8 Amp
(c) 0.5 Amp (d) 1.2 Amp

**41. A person has five resistances, each of which has a value of (1/5) Ω. Find the value of maximum resistance obtained by adding them.**
(a) $\frac{2}{5}\Omega$ (b) 1 Ω
(c) $\frac{1}{2}\Omega$ (d) 5 Ω

**42. The process of taking out stored results out of physical memory of computers is known as:**
(a) output process (b) programming
(c) processing (d) input process

**43. Which of the following is NOT a part of auxiliary memories in a Computer system?**
(a) Magnetic tapes (b) PROM
(c) CD-ROM (d) Floppy

**44. ……. gas, released from chlorofluorocarbons, is harmful to the ozone layer.**

(a) Hydrogen (b) Chlorine

(c) Hydrogen sulphide (d) Nitrogen dioxide

**45. Which of the following components does not affect the resistance of a conductor?**

(a) Length

(b) Pressure

(c) Area of cross section

(d) Matter

**46. The width of A4 size paper/sheet is _____ mm.**

(a) 297 (b) 210

(c) 330 (d) 240

**47. The ISO designation of sheet of size 594 mm × 841 mm is_____.**

(a) A0 (b) A1

(c) A2 (d) A3

**48. What is called pushing or pulling an object to move it?**

(a) pressure (b) force

(c) friction (d) inertia

**49. Force between two bodies, always …….**

(a) Used in the same and opposite directions

(b) Used in same direction

(c) Used in uneven and opposite directions

(d) Are separate forces

**50. A boy of 50 kg mass climbs 44 stairs in 10 seconds. If the height of each stair is 15cm then find his power?**

(a) 337.5ms (b) 387.5W

(c) 330J (d) 330W

# SOLUTION : PRACTICE SET- 4

## ANSWER KEY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1. (d)** | **6. (d)** | **11. (c)** | **16. (b)** | **21. (b)** | **26. (a)** | **31. (b)** | **36. (d)** | **41. (b)** | **46. (b)** |
| **2. (a)** | **7. (d)** | **12. (a)** | **17. (a)** | **22. (b)** | **27. (a)** | **32. (d)** | **37. (c)** | **42. (a)** | **47. (b)** |
| **3. (c)** | **8. (b)** | **13. (c)** | **18. (a)** | **23. (a)** | **28. (d)** | **33. (a)** | **38. (a)** | **43. (b)** | **48. (b)** |
| **4. (d)** | **9. (c)** | **14. (a)** | **19. (d)** | **24. (a)** | **29. (c)** | **34. (b)** | **39. (c)** | **44. (b)** | **49. (a)** |
| **5. (d)** | **10. (b)** | **15. (d)** | **20. (b)** | **25. (a)** | **30. (a)** | **35. (a)** | **40. (d)** | **45. (b)** | **50. (d)** |

## SOLUTION

**1. (d)**

0.2 mm thick lines are used for dotted lines, outlines, cutting planes.

**Out lines:-**

- Lines drawn to represent visible edges and surface boundaries of objects
- It is also known as object lines or principal lines.
- It is represented by continuous thick lines

**Cutting Plane lines:-**

- These are long, thin chain line with thick ends.
- It is use to show the location of cutting plane.

**Dotted line:-**

- Closely and evenly spaced dashed lines of equal lengths.
- They are medium thick and are used to show the invisible or hidden parts of the object on the drawing.

**2. (a)**

Lettering should be so done that can be read from the front with the main title horizontal .

**3. (c)**

Given, mass of boy, m = 50 kg

h = 43 x15 = 645 cm = 6.45 m

t = 10 s, g = 10 $m/s^2$

PE = mgh = 50 x 10 x 6.45 = 3225 J

Power of the boy = PE / time = 3225 / 10 = 322.5 W

**4. (d)**

The S.I. unit of gravitational acceleration 'g' is same as the S.I. unit of linear acceleration, The SI unit of acceleration is meter per second square ($m\ s^{-2}$).

Dimensional formula of acceleration is ($LT^{-2}$).

CGS unit of acceleration = $cm/s^2$.

**5. (d)**

**Information symbols**–This signs are information resulted, by these signs a variety of notifications are given.

Shape – Square

Background – Green colour

Sign made of – White colour

Background – White colour

Sign made of – Red colour

**6. (d)**

In the given option 1 mega byte unit is the smallest unit in computer data storage.

**7. (d)**

Petabyte is the largest memory data unit, while others are the storage devices.

**8. (b)**

It is the capacity of doing work. The mechanical energy is equal to the work done on a body in altering either its position or its velocity.

**9. (c)**

The S.I. unit of energy is Joule.

**10. (b)**

Given,

$R_1 = 2\Omega$ $R_2 = 3\Omega$

So, equivalent resistance,

$$R = R_1 + R_2$$

$$R = 2\Omega + 3\Omega = 5\Omega$$

According to ohms law in series circuit current will be same.

$\Rightarrow V = iR$

$\Rightarrow 15 = i5$

$\Rightarrow i = \frac{15}{5}$

$\Rightarrow i = 3A$

**11. (c)**

There are three pre requisites for any fire or explosion to take place and that is– (1) Oxygen (2) fuel (3) Heat (ignition).

• Nitrogen is not included in the three pre-requisites.

**12. (a)**

$\because$ 1 unit energy = 1 KW-hour = $3.6 \times 10^6$ joule

$\therefore$ 320 unit energy = $320 \times 3.6 \times 10^6 = 1152 \times 10^6$ joule

**13. (c)**

Given, P = 100 W, h = 8 hr, d = 5 day

$$\text{Energy consumed} = \frac{W \times h \times d}{1000}$$

$$= \frac{100 \times 8 \times 5}{1000}$$

$$E = \frac{40}{10} = 4$$

Therefore, the energy used in 5 days will be 4 units.

**14. (a)**

Kapil is standing with a weight of 10 kg on his shoulder. It is clear that displacement is zero, so the work done by Kapil will be zero.

**15. (d)**

The notation of $2 \times \phi 6$ means 2 circles of diameter 6 units.

**16. (b)**

If we show the actual length of on object on a drawing then the scale used in full size scale designation of full size scale 1 : 1

**17. (a)**

5 : 1 one is the enlarging scale.

**Enlarging scale -:** Enlarging scale means that the drawing is drawn with the bigger dimension in comparison to the actual dimension of the object.

**Eg-•** A representative fraction of 1:0.2 means 5: 1, i.e. the drawing is five times bigger than the actual object.

Hence, the scale is enlarging scale.

• Drawing instrument of watches etc, are made larger than their real size these are said to be drawn or an enlarging or increasing scale designation of enlarging scale x : 1 example 20 : 1

**18. (a)**

**Positive Work–**When force and displacement are in the same direction, the work performed on an object is said to be positive work.

**Negative Work–**Negative work is performed if the displacement is opposite to the direction of the force applied.

**Zero Work–**When force and displacement are perpendicular to each other, or when force or displacement is zero then there will be no work done.

**19. (d)**

Align or alignment is a term used to describe how text is placed on the screen. In an excel worksheet the numbers are align to the right while the texts are align to the left by default.

**20. (b)**

| **Short cut–key board** | **Operations** |
|---|---|
| Ctrl + R – | Align the text to the right |
| Ctrl + Y – | REDO the previous action if possible |
| Alt + Z – | To access the Geforce Experience in game |
| Alt + Y – | To open the Database tool tab in Microsoft Access |

**21. (b)**

The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. It was agreed on 16th September 1987, and entered into force on 1st January 1989. In year 1987 they took decision to stop the production of chlorofluorocarbons (CFC) till year 2000 by all the developed countries.

**22. (b)**

(U) = mgh

here, m = 40 kg, h = 5 m & g = 10 $m/s^2$

Potential energy , (U) = $40 \times 10 \times 5 = 2000$ J

**23. (a)**

When an object is in a static state, it has potential energy but when it is dropped down freely, the energy generated due to its motion is called kinetic energy. But as the body moves downwards, the force of gravity acts on it, which increases the kinetic energy as its speed increases.

**24. (a)**

| **(Colour)** | **(Symbol type)** |
|---|---|
| A. Red | Prohibition |
| B. Yellow | Warning |
| C. Blue | Mandatory |
| D. Green | Emergency escape |

**25. (a)** ∵ Force (F) = mass (m) × acceleration (a)

$F = m \times a$

$100 = 50 \times a$

$a = 2\ ms^{-2}$

**26. (a)**

Let the mass of the object is (m) = 5 kg.

Initial velocity of object (u) = 6 $ms^{-1}$

Final velocity of object (v) = 8 $ms^{-1}$

And the time taken t = 2 seconds

The force (F) =?

$\because F = ma$

$$\therefore a = \frac{v-u}{t}$$

$$F = \frac{m(v-u)}{t} = \frac{5(8-6)}{2} = \frac{10}{2} = 5\,N$$

**27. (a)**

Negative acceleration is opposite to the velocity direction.

When the velocity of body decreases, its acceleration is negative. Negative acceleration is called 'retardation' or 'deacceleration'. When a stone is thrown upwards, it is under retardation. Similarly, when a bus approaches a bus-stop, its motion gets retarded.

**28. (d)**

Some commonly pictorial drawings used in industry are isometric view and oblique view.

- Perspective views are not used by engineers for manufacturing or in industry because these views do not reveal the exact size and shape of an object.
- It may be used in marketing where a natural view of a product is desirable.

**29. (c)**

Perspective projection is also the type of pictorial projection and generally used by the architects.

- It is most natural view.
- This view is not useful for manufacturing purpose or in industry.

**30. (a)**

Isometric drawing–

- Isometric drawing is a particular drawing style where the angle between the X, Y and Z axes are all $120^o$.

**31. (b)**

**First Generation-** The period of first generation: 1946-1959. Vacuum tube based.

**Second Generation-** The period of second generation: 1959-1965. Transistor based.

**Third Generation-** The period of third generation: 1965-1971. Integrated Circuit based.

**Fourth Generation-** The period of fourth generation: 1971-1980. VLSI microprocessor based.

**Fifth Generation-** The period of fifth generation: 1980-onwards. ULSI microprocessor based.

**32. (d)**

**Greenhouse Gases are :–** Water vapor ($H_2O$), Carbon dioxide ($CO_2$), Chlorofluorocarbons ($CFC_S$), Methane ($CH_4$), Nitrous oxide ($N_2O$), Sulphur hexafluoride ($SF_6$), Hydrofluorocarbon ($HFC_S$), Perfluorocarbons ($CF_4$, $C_2F_6$) and Carbon monoxide etc. If we consider relative contribution of various greenhouse gases to total global warming which includes carbon dioxide (60%), methane (20%), $CFC_S$ (14%) and nitrous oxide (6%), then option (c) will be the correct answer.

**33. (a)**

If the width of a standard engineering drawing sheet is 841 mm, then its length will be 1189 mm.

- It is the size of A0 sheet size being 841×1189 mm
- A0 is the largest sheet size.

**34. (b)**

The full form of the abbreviation AC in an engineering drawing is across corners.

- Followings are the various terms and their respective abbreviations in engineering drawings.

| | |
|---|---|
| AC | Across Corners |
| AF | Across Flats |
| AR | As Required |
| ASA | American Standard Association |

**35. (a)**

The Apple I, also known as the Macintos Portable Computer, was an early personal computer. It was designed and hand-built by Steve Wozniak. Wozniak's friend Steve Jobs had the idea of selling the computer. The Apple I was Apple's first product, demonstrated in April 1976 at the Homebrew Computer Club in Palo Alto, California.

**36. (d)**

If a body (car) is moving at a fixed acceleration, its velocity will change continuously, if the body is moving at a fixed speed, its acceleration will be zero because rate of change of velocity/unit time is called acceleration.

**37. (c)**

Given,

$R_1 = R_2 = R_3 = R_4 = R_5 = 5\Omega$

For maximum resistance, resistors are connected in series,

$R = 5 + 5 + 5 + 5 + 5$

$R = 25\Omega$

$V = 15V$

$I = ?$

We know that, from Ohm's law,

$V = IR$

$$I = \frac{V}{R}$$

$$I = \frac{15}{25}$$

= 0.6Amp

**38. (a)**

Boreal forest is known for its coniferous (cone-bearing evergreen) forests. It is the northern most forest in the world.

**39. (c)**

The biggest Biosphere Reserve of India in terms of geographical area is Kutch, which is located in the state of Gujarat.

**Note-**

→ The smallest biosphere Reserve in India is Dibru-Saikhowa in Assam.

→ The first Biosphere reserve in India is Nilgiri Biosphere reserve.

**40. (d)**

Given,

$R_1 = 6\Omega$, $R_2 = 4\Omega$

V = 12V

I = ?

In series combination

$R_{net} = R_1 + R_2$

$R_{net} = 6 + 4 = 10\Omega$

We know that, from Ohm's law,

$$V = IR$$

$$I = \frac{V}{R_{net}}$$

$$I = \frac{12}{10}$$

I = 1.2Amp

**41. (b)**

Maximum resistance (resistance added to series order)

$$R_1 = R_2 = R_3 = R_4 = R_5 = \frac{1}{5}$$

$$R = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{5}{5} = 1\Omega$$

**42. (a)**

The process of taking out stored result out of physical memory of computer is known as output process.

**43. (b)**

Auxiliary memory, also known as auxiliary storage, secondary storage, secondary memory or external memory, is a non-volatile memory (does not lose stored data when the device is powered down) that is not directly accessible by the CPU, because it is not accessed via the input/output channels (it is an external device). Examples: Hard Disks, Floppy Disks, CD-ROM, Magnetic Tapes etc. PROM is a type of primary memory.

**44. (b)**

Chlorine gas is released from chloro-fluorocarbons which is harmful to the ozone layer. One chlorine atom can destroy over 100,000 ozone molecules before it is removed from the stratosphere.

**45. (b)**

We know that resistance of a conductor-

$$\boxed{R = \frac{\rho l}{A}}$$

where, ρ = resistivity of conductor material

$l$ = length of conductor

A = cross-sectional area of conductor

From the above expression we can say that resistance of a conductor depends on. ρ, $l$, and A but it does not depend on pressure.

**46. (b)**

A4 size paper sheet is (297 × 210 mm)

- The width of A4 size is 210 mm.

**47. (b)**

There are three designation of a drawing sheet–

1. Size series – A (first choice)
2. Special elongated sizes (second choice)
3. Exceptional elongated sizes (Third choice)

The preferred sizes of the trimmed sheets as selected from the main ISO-A series are given in table–

| | |
|---|---|
| A0 | 841 × 1189 |
| A1 | 594 × 841 |
| A2 | 420 × 594 |
| A3 | 297 × 420 |
| A4 | 210 × 297 |

**48. (b)**

In science, a push or a pull on an object is called a force. Example - open or close the door its example of push or pule of an object.

**49. (a)**

The force between two bodies is always used in the same and opposite direction.

**50. (d)**

Given, mass of body, m = 50 kg

h = 44 x15 = 660 cm = 6.60 m

t = 10 s, g = 10 $m/s^2$

PE = mgh = 50 x 10 x 6.60 = 3300 J

Power consumed by the boy=PE/time=3300/10=330 W

# PRACTICE SET - 5

**1. Which of the following activities can be said to have work done ?**
(a) Harsh is reading the book
(b) Pinky is walking on a flat road with a book on her head
(c) Shruti is sitting on the chair
(d) Khusi is pushing the wall of the house, but fails to do it.

**2. When a body of mass 'm' attains a velocity 'v' from rest in time 't', then the kinetic energy of translation is—**
(a) mv2 (b) mgv2
(c) 0.5 mv2 (d) 0.5 mgv2

**3. A boy of 50 kg mass climbs 40 stairs in 10 seconds. If the height of each stair is 15cm, then calculate his power.($g= 10ms^{-2}$)**
(a) 337.5W (b) 300J
(c) 300W (d) 300ms

**4. In isometric projection the isometric length are_____% of the true length.**
(a) 100% (b) 50%
(c) 81.65% (d) 82%

**5. While making isometric projection isometric scale is used. What approximate percent of true scale is isometric scale?**
(a) 18% (b) 82%
(c) 80% (d) 90%

**6. When a 10 mm long line of a drawing represents 1 metre length of the object, the R.F. =_____ ?**
(a) $\frac{1}{1000}$ (b) $\frac{1}{100}$
(c) $\frac{1}{10}$ (d) $\frac{1}{5}$

**7. A/an..... angle is the between two intersecting planes.**
(a) offset (b) spleen
(c) dihedral (d) polar

**8. A cuboid has _____Faces.**
(a) 2 (b) 4
(c) 6 (d) 8

**9. A boy of 50 kg mass climbs 45 stairs in 9 seconds. If the height of each stair is 15cm, then calculate his power.($g= 10ms^{-2}$)**
(a) 325W (b) 275W
(c) 475W (d) 375W

**10. Which of the following is NOT a spreadsheet program?**
(a) Ubuntu (b) Calci
(c) Excel (d) VisiCalc

**11. What is the full form of FORTRAN ?**
(a) Fortitude Translation
(b) Foreign Translation
(c) Formula Translation
(d) FoxPro Translation

**12. The safety device used to protect eyes while grinding is**
(a) Hand screen (b) Helmet
(c) Chipping goggles (d) Chipping screen

**13. Which of the following activity is not responsible for greenhouse effect?**
(a) Use of solar car for transport
(b) Emission from thermal power plant
(c) Use of wood as fuel
(d) Use of petrol vehicles for transport

**14. Which is the most important contributor of global warming?**
(a) Carbon emission
(b) Agriculture work
(c) Destructions of forests
(d) Industry

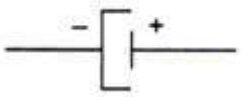
**15. Calculate the current in a wire if 1200 C of charge passes through it in 10 minutes.**
(a) 3 A (b) 4 A
(c) 2 A (d) 1.5 A

**16. In an Excel worksheet, the content of the active cell is displayed in _____.**
(a) Formula bar (b) Title bar
(c) Name box (d) Status bar

**17. In MS-Word, what is the maximum font size you can apply for any character?**
(a) 163 (b) 16038
(c) 1670 (d) 1638

**18. Which of the following is trapezoidal thread?**
(a) Acme (b) Square
(c) Buttress (d) All of the above

**19. What is the name of the item shown in symbol below?**




(a) Linear variable capacitor
(b) Non linear variable capacitor
(c) Electrolytic capacitor
(d) Trimmer

**20. If a 2 mm long edge of an object is shown by a line 1 cm long, the R.F =_____.**
(a) $\frac{1}{2}$ (b) $\frac{1}{20}$
(c) 5 (d) $\frac{1}{5}$

**21. How much work is done in moving a charge of 5Q across two points having a Potential difference of 10V?**
(a) 50 A (b) 50 C
(c) 50 J (d) 50 V

**22. Battery capacity is expressed in .....**
(a) Ampere-hour (b) Voltage
(c) Battery load (d) Volume of electrolyte

**23. Which of the following is NOT a goal of sustainable agriculture?**
(a) Minimising input of chemicals
(b) Maximising economic value
(c) Minimising labour and effort
(d) Maximising environmental health

**24. Which of the following devices converts chemical energy into electrical energy?**
(a) transformer (b) battery
(c) electric generator (d) wheel

**25. The commercial unit of electrical energy is .....**
(a) Watt (b) Calorie
(c) Kilowatt hour (d) Joule

**26. The S.I. unit of resistance is equivalent to:**
(a) joule/coulomb (b) volt/ampere
(c) ampere/volt (d) coulomb/joule

**27. Density of pure water is __ that of saline water.**
(a) Less than
(b) Equal to
(c) More than
(d) Negligible compared to

**28. In an ideal machine :**
(a) All
(b) efficiency is 1
(c) effort equals work done
(d) friction losses are neglected

**29. According to the international colour code for electrical wire, which of the following options represents neutral wire.**
(a) Red (b) Green
(c) Blue (d) Yellow

**30. The electrical circuit consists of…**
(a) Electrical components, connective wires and plug keys
(b) Electrical components, connective wires and cells (batteries)
(c) Electrical components and connective wires
(d) Electrical components, connective wires, cells (batteries) and plug keys

**31. A cube has _____faces.**
(a) 4, equal (b) 6, unequal
(c) 6, equal (d) 4, unequal

**32. In third - angle projection ,_____,**
(a) the object lies in the second quadrant
(b) the plane of projection lies between the object and the observer
(c) the object lies in the first quadrant
(d) the object lies between the observer and the plane of projection

**33. If a point is situated in vertical plane then where its plan will be made ?**
(a) On H.P. (b) On V.P.
(c) On A.V.P. (d) On XY line

**34. A current of 0.2 A is maintained in a resistor of 10Ω. The heat produced in the resistor in 1 second is :**
(a) 50 J (b) 0.2 J
(c) 25 J (d) 0.4 J

**35. The heat generated H due to Joule's heating effect is directly proportional to ————.**
(a) square of the current
(b) cube of the current
(c) square root of the current
(d) cube root of the current

**36. In first aid, applying pressure to stop a bleeding becomes…..**
(a) safe (b) unsafe
(c) dangerous (d) no dangerous

**37. To maintain the current in a given electrical circuit, the cell has to spend ..... energy stored in it.**
(a) Electric (b) Kinetic
(c) Chemical (d) Potential

**38. Telephone calls between two peoples over the internet is –**
(a) E- Telephony (b) Internet Telephony
(c) Chatting (d) E-Calling

**39. Which internet giant company has launched training program to promote its products online to empower rural self help group (SHG) in Telangana?**
(a) Amazon (b) Flipkart
(c) Facebook (d) Twitter

**40. Which of the following tips helps to maintain the potential of the conductor?**
(a) ammeter (b) galvanometer
(c) cell or battery (d) voltmeter

**41. The product of mass and acceleration is called.**
(a) Pressure (b) Impulse
(c) Thrust (d) Force

**42. Orthographic projection is a_____projection.**
(a) One view (b) Two view
(c) Multi view (d) Four dimensional

**43. As per 'India State of Forest Report 2021' area-wise which state has the largest forest cover in the country?**
(a) Assam (b) Karnataka
(c) Uttar Pradesh (d) Madhya Pradesh

**44. Which of the following is true regarding DDT?**
(a) It is light blue in color.
(b) It has a pungent odour.
(c) It is non-toxic.
(d) It is a contact insecticide.

**45. Which information sheet should be used as a safety standard while doing electrical work–**
(a) Extremely hot-do not come in contact
(b) Extremely dangerous
(c) Strictly prohibited area
(d) do not touch hot

**46. Which of the following examples explains Newton's third law of motion?**
(a) Rocket launching
(b) On the sudden move of the bus, the passengers get jerked backwards.
(c) When we stop pedaling, the cycle starts to slow down.
(d) While catching a fast approaching cricket ball, the fielder slowly moves his hand backwards with the moving ball.

**47. A galvanometer when connected in a circuit, detects the presence of:**
(a) Current (b) Frequency
(c) Resistance (d) Potential difference

**48. What is the full form of PDF in the context of file formats?**
(a) Portable Document Format
(b) Prefixed Detachable Format
(c) Processing Digital File
(d) Picture Disc Format

**49. FTTP stands for**
(a) Fusion To The Premises
(b) Fiber To The Permission
(c) Fiber To The Premises
(d) Frame To The Permission

**50. If three resistors of 3 Ω, 2 Ω and 6 Ω are connected in series combination with a 9 V battery, then the potential difference across the 6 Ω resistor will be:**
(a) 9 V (b) 2.4 V
(c) 1.6 V (d) 4.9 V

# SOLUTION : PRACTICE SET- 5

## ANSWER KEY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1. (*)** | **6. (b)** | **11. (c)** | **16. (a)** | **21. (c)** | **26. (b)** | **31. (c)** | **36. (a)** | **41. (d)** | **46. (a)** |
| **2. (c)** | **7. (c)** | **12. (c)** | **17. (d)** | **22. (a)** | **27. (a)** | **32. (b)** | **37. (c)** | **42. (d)** | **47. (a)** |
| **3. (c)** | **8. (c)** | **13. (a)** | **18. (a)** | **23. (c)** | **28. (a)** | **33. (d)** | **38. (d)** | **43. (d)** | **48. (a)** |
| **4. (c)** | **9. (d)** | **14. (a)** | **19. (a)** | **24. (b)** | **29. (c)** | **34. (d)** | **39. (c)** | **44. (d)** | **49. (c)** |
| **5. (b)** | **10. (a)** | **15. (c)** | **20. (c)** | **25. (c)** | **30. (d)** | **35. (a)** | **40. (c)** | **45. (b)** | **50. (d)** |

## SOLUTION

**1. (*)**
Pinky is walking on a flat road with a book on her head, it can be said their will be no work done.
Because here, the force due to the gravity is perpendicular to the displacement of object. In other options their are no any displacement of object.
So here remaining option also work done will be zero.

**2. (c)**
Kinetic energy of an object is the energy that if possesses due to its motion. It is defined as the work needed to accelerate a body of a given mass from rest to its stated velocity.

$$\text{Kinetic energy} = \frac{1}{2}mv^2$$
$$= 0.5\ mv^2$$

**3. (c)**
Given, mass of boy, m = 50 kg
h = 40 x15 = 600 cm = 6.0 m
t = 10 s, g = 10 m/s$^2$
PE = mgh = 50 x 10 x 6 = 3000 J
Power = PE / time
= 3000/ 10 = 300 W

**4. (c)**
Isometric projections are drawn by using isometric scale, which converts true length into isometric lengths which are foreshortened to 0.8165 times or 81.65% of the true length.
i.e. Isometric scale length = $\sqrt{2}/\sqrt{3} \times$ true length
= 81.65% of true length.

**5. (b)**
While making isometric projection isometric scale is used.
- In drawing isometric projection, when lines are drawn parallel to isometric axes, the lengths are foreshortened to 0.816 times the actual length.

i.e. isometric scale = 0.816 × true scale
≈ 82% of true scale.

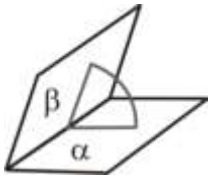
**6. (b)**
Length of the object = 1 meter
Actual length = 10 mm = 0.01 m
RF = ?

$$RF = \frac{\text{Length of the object in drawing}}{\text{Actual length of the object}}$$

$$RF = \frac{0.01\,m}{1\,m}$$

$$RF = \frac{1}{100}$$

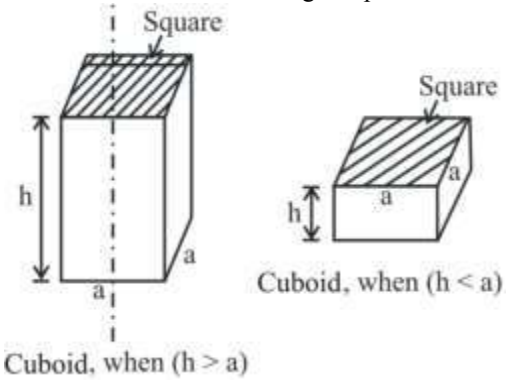
**7. (c)**
A dihedral angle is the between two intersecting planes or half-planes.




**8. (c)**

A cuboid have 6 faces.

- It is a solid shape or a 3D shape
- It is bounded by six rectangular faces with eight vertices and twelve edges.
- A cuboid is also called a rectangular prism.




**9. (d)**

Given,

mass of boy = 50 kg

h = 45 x15 = 675 cm = 6.75 m

t = 9 s, g = 10 m/s$^2$

PE = mgh = 50 x 10 x 6.75 = 3375 J

Power = PE / time = Energy / time

$= \frac{3375}{9} = 375$ J/s=375 W

**10. (a)**

A spreadsheet is a software program we use to easily perform mathematical calculations on statistical data. Some examples of spreadsheet application are Excel, VisiCalc, Calc, Lotus etc. Thus among given options, Ubuntu is not a spreadsheet program, It is a complete Linux operating system.

**11. (c)**

The full form of FORTRAN is 'Formula Translation'. It was created by John Backus in 1957 as the first high level programming language. It was fundamentally designed to write high– Performance computing programming and suited explicitly to computational computing and scientific application requiring detailed math calculations in numerical computing. Some of the special character may be used in an extensive manner which may be prove impactful while solving algebraic formula.

**12. (c)**

The safety device used to protect eyes while grinding is chipping goggles (safety goggles).

- The safety device used to protect eyes while are welding is dark glass screen.

**13. (a)**

Emissions from thermal power plant, use of wood as fuel and use of petrol vehicles for transport are responsible for green house effect because these activities emit green house gases while use of solar car for transport is not responsible for green house effect because solar energy is a renewable source of energy .The main gases responsible for the greenhouse effect include carbon dioxide, methane, nitrous oxide, and water vapor (which occur naturally), and fluorinated gases (which are synthetic). Greenhouse gases have different chemical properties and are removed from the atmosphere, over time, by different processes.

**14. (a)**

Carbon emission is the most contributor of global warming. Global warming means increase in global average temperature. $CO_2$ contributes the most of global warming. In the year 1990 the amount of $CO_2$ in the atmosphere was 280 PPM, which today has reached 400 PPM.

**15. (c)**

Given,

Charge Q = 1200 C

Time t = 10 minutes = 10 × 60 seconds

= 600 sec.

We know that,

$Q = i \times t$

$i = \frac{Q}{t}$

or $i = \frac{1200}{600} = 2A$

**16. (a)**

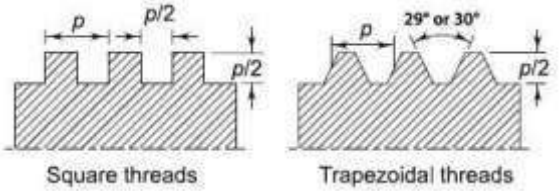
In MS- Excel word sheet, the content of the active cell is displayed in formula bar.

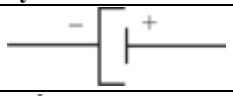
**17. (d)**

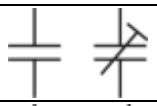
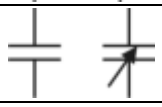
The maximum font size available in MS-Word 2010 from the dropdown list is 72, however the font size can be setup of 1638 by typing the size manually for the font.

**18. (a)**

Trapezoidal thread and Acme thread both are the same size but the angle of acme thread is 29° and the angle of trapezoidal thread is 30°




| **19. (a)** | |
|---|---|
| **Element** | **Symbol** |
| Linear variable capacitor |  |
| Electrolytic capacitor |  |

| | |
|---|---|
| Trimmer |  |
| Capacitor fixed variable |  |

**20. (c)**
Given,
Actual length = 2 mm = 0.2 c.m.
length of the object = 1C. m.

$$RF = \frac{\text{length of the object}}{\text{Actual length}}$$

$$RF = \frac{1\,\text{c.m.}}{0.2\,\text{c.m.}} \quad RF = 5$$

**21. (c)**
We know that,
Work = Voltage × Charge
Here, Charge (Q) = 5 Q
Voltage (V) = 10 V
(Electrical potential difference is also known as voltage.)
$W = V \times Q$
$W = 10 \times 5$
$W = 50$ J

**22. (a)**
Battery capacity is expressed in ampere-hour. The amount of available charge is the capacity of cell or battery which may be expressed in A.h (ampere-hour)

**23. (c)**
Sustainable agriculture integrates three main goals i.e. environmental health, economic profitability and social equity. Hence, minimising labour and effort is not a goal of sustainable agriculture.

**24. (b)**
The battery converts chemical energy into electrical energy. The dynamo converts mechanical energy into electrical energy. The electric bulb converts electrical energy into light and heat energy. Radio converts electrical energy into sound energy.

**25. (c)**
The commercial unit of electrical energy is kilowatt hour.
One kilowatt hour
$= 1000W \times 1$ hour
$= 1000 \times 3600$
$= 3.6 \times 10^6$ Joule

**26. (b)**
According to ohms law
$V = IR$
$R = V/I$
SI unit of resistance = volt/ampere.

**27. (a)**
Density of pure water is less than that of saline water.

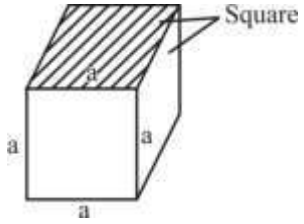
**28. (a) In an ideal machine-**
- The mechanical efficiency of an deal machine is 1 or 100%.
- Effort is equals work done.
- The ideal machine does not have friction means, friction losses are neglected.
- But any machine is not an ideal machine.

**29. (c)**
Wire colour in circuit-

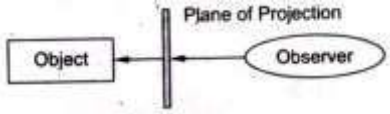
| **Colour of Wire** | **Use** |
|---|---|
| 1. Red/Yellow | Phase wire |
| 2. Blue/Black | Neutral wire |
| 3. Green | Ground wire |

**30. (d)**
The electrical circuit consists of electrical components, connective wires, cells (batteries) and plug keys. Whereas diodes, transistors or IC chip are the component of an electronic circuit.

**31. (c)**
A cube have 6 equal faces.
- A cuboid with six square faces is called a cube.
- A cube is one of the simplest shape in 3D space or solids.
- It has 8 vertices and 12 edges such that 3 edges meet at one vertex point

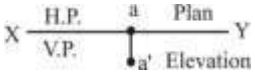



**32. (b)**
In third angle projection, the plane of projection lies between the object and the observer.




- The plane of projection is assured to be transparent.
- H.P. and V.P. is located above and below the reference line respectively.
- Projection is drawn same side to the viewly.

**33. (d)**
If a point is situated in vertical plane then its plan will be obtained on the XY line and the front view of this point will be obtained at some distance from the XY line.




**34. (d)**
Given,
Current(I) = 0.2 A
Resistance(R) = 10 Ohm
Heat (H) = I × I × R×t
$H = I^2Rt$
$H = 0.2 \times 0.2 \times 10 \times 1$
$= 0.2 \times 0.2 \times 10$
$= 0.4$ J

**35. (a)**
We know that, H = VIt ..... (i)
Here, V = Potential difference
I = Current
t = Time
H = Heat produce