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# DDCET – 2026 PRACTICE PAPER SET – 2 Solution

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Booklet  
Series

**B**

❖ This is the detailed solution of **DDCET – 2026 Practice Paper Set – 2**, which was provided along with the **DDCET Practice Booklet**. The purpose of this solution set is to help students analyze their performance, understand the correct approach to solving questions, and improve their problem-solving skills for the upcoming DDCET exam.

**Best wishes for your DDCET-2026 preparation!**

**Team DESI Students**

Section -1: Basics of Science and Engineering

1. The equation for potential energy (PE) is:

(A)  $PE = m \times g \times h$

(B)  $PE = \frac{1}{2}mv^2$

(C)  $PE = \frac{1}{2}mv$

(D)  $PE = m \times g$

Correct Ans: A

Solution

Formula for Gravitational Potential Energy (PE):

$$PE = m \times g \times h$$

Where,

PE is the Gravitational Potential Energy in Joule

m is the mass of the object in kg

g is the gravitational acceleration constant in  $m/s^2$  & is equal to  $9.8 m/s^2$

2. How are centripetal force (F), mass (m), velocity (v), and radius (r) of the circular path related to each other?

(A)  $F \propto \frac{1}{r}$

(B)  $F \propto v$

(C)  $F \propto m$

(D)  $F \propto \frac{v^2}{r}$

Correct Ans: D

Solution Centripetal

Force:

Centripetal force is a force that acts on an object moving in a circular path, directed toward the center around which the object is moving.

The formula for Centripetal Force (Fe):

$$Fe = \frac{mv^2}{r} \quad \left( \because Fe = mass \times acceleration = m \times \frac{v^2}{r} \right)$$

We know that  $v = r \times \omega$

$$Fe = \frac{mv^2}{r} = \frac{m(r\omega)^2}{r} = mr\omega^2$$

Note:

Relation between Angular velocity ( $\omega$ ) and Linear velocity ( $v$ )

$$v = r\omega$$

Where,

$\omega$  - Angular Velocity in rad/second

$v$  - Linear Velocity in m/s

$r$  - radius of circle in meter

3. What is a key benefit of using optical fibers for communication?

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- (A) Low bandwidth
- (B) Limited range
- (C) Immunity to electromagnetic interference
- (D) High attenuation

Correct Ans: C

Solution

Advantage of optical fibers using in communication

=? High bandwidth

=? Low attenuation

=? Immunity to electromagnetic interference

=? It has the ability to carry signals across long distances without the necessity of signal amplification, which makes them suitable for long-distance communication.

4. Arrange the following metals in order of increasing reactivity (least reactive to most reactive):

Gold, Copper, Sodium

- (A) Sodium, Copper, Gold
- (B) Copper, Gold, Sodium
- (C) Gold, Copper, Sodium
- (D) Gold, Sodium, Copper

Correct Ans: C

**Solution**

K	Potassium	<div>Most reactive</div> <div>Reactivity</div> <div>Least reactive</div>
Na	Sodium	
Ca	Calcium	
Mg	Magnesium	
Al	Aluminium	
Zn	Zinc	
Fe	Iron	
Sn	Tin	
Pb	Lead	
Cu	Copper	
Hg	Mercury	
Ag	Silver	
Au	Gold	

∴ The figure shows the list of elements arranged according to their reactivity.

∴ From given materials in question, gold is least reactive and sodium is most reactive material.

5. Define heat capacity.

- (A) The amount of heat required to raise the temperature of a substance by 1 Joule
  - (B) The total heat content of a substance
  - (C) The amount of heat required to raise the temperature of a substance by 1 Kelvin
  - (D) The amount of heat required to raise the temperature of a substance by 1 degree Celsius
- Correct Ans: C**

**Solution**

Heat Capacity

∴ It is the ratio of the amount of heat (Q) given to a body to a change in its temperature (  $\Delta T$  ) .

$$H.C = \frac{Q}{\Delta T}$$

∴ SI Unit:  $J/K$

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=?-Other Unit: *Cal/Kor  $J/^{\circ}C$  or  $Cal/^{\circ}C$*

=?-Therefore, from the above explanation the correct option is (C) The amount of heat required to raise the temperature of a substance by 1 Kelvin.

6. Which semiconductor material is commonly used in the manufacturing of solar cells?

- (A) Silicon
- (B) Copper
- (C) Aluminum
- (D) Lead

Correct Ans: A

Solution

=?- Silicon stands as a extensively utilized semiconductor material in the field of solar cell technology.

7. If the instrument is reading a value greater than the true value in the case of a Vernier caliper, the error is called a:

- (A) Negative zero error
- (B) Positive zero error
- (C) Parallax error
- (D) Zero error

Correct Ans: B Solution

**Vernier caliper :**

=?-The vernier caliper was invented by the French mathematician and instrument maker Pierre Vernier in 1631.

=?-The vernier caliper is a widely used tool for making precise measurements of lengths and diameters and thicknesses of larger objects in fields such as physics, engineering, and manufacturing, such as diameter of solid cylinder, internal and external diameter of a hollow cylinder.

**Positive error:**

If the vernier scale zero division lies right of the main scale zero division, the error is called positive error. This indicates that the instrument is reading a value greater than the true value.

8. What is the term for the process of releasing water from a hydroelectric dam to meet high electricity demand?

- (A) Turbine operation
- (B) Spillway discharge
- (C) Load shedding
- (D) Peak shaving

Correct Ans: B

**Solution**

:::} In times of increased demand, surplus water is discharged through the spillway to generate additional electricity.

9. A programme that converts a high level language programme to a set of instruction that can run on a computer is called a
- (A) Compiler
  - (B) Debugger
  - (C) editor
  - (D) All of above

**Correct Ans: A**

**Solution**

:::} A compiler is a program that translates a high-level language program (like C, Java, or Python) into machine code or instructions that the computer's processor can execute.

--+ This translation is done all at once, creating an executable file that can be run independently.

10. How are standing waves formed?
- (A) By the refraction of a wave through different media
  - (B) By the interference of two waves traveling in opposite directions
  - (C) By the reflection of a wave at boundaries
  - (D) By the diffraction of a wave around obstacles

**Correct Ans: B**

**Solution**

Stationary waves (Standing waves)

:::} Stationary waves, also known as standing waves, stationary waves are formed by the interference of two waves with the same frequency as well as amplitude, traveling in opposite directions.

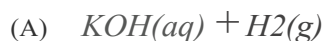
11. Which of the following should you use if you want all the slides in the presentation to have the same 'look'?
- (A) The slide layout option
  - (B) Add a slide option
  - (C) Outline view
  - (D) A presentation design template

**Correct Ans: D**

**Solution**

:::} By selecting a presentation design layout from design tab, it will be applied consistently across all slides, ensuring a cohesive and professional presentation.

12. Complete the chemical equation of the metal-water reaction given below:  $2K(s) + 2H_2O(l) \rightarrow$



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- (B)  $KH(aq) + H_2O(g) + \text{heat energy}$
- (C)  $2KOH(aq) + H_2(g) + \text{heat energy}$
- (D) None of above

Correct Ans: C

Solution

∴ Potassium and sodium are metals that have a strong reaction when they come into contact with cold water.

∴ The reaction is so intense and releases a lot of heat that the hydrogen gas produced instantly ignites.

∴ The chemical equation of this reaction can be written as



13. What is the term for the gradual increase in the Earth's average surface temperature?

- (A) Global cooling
- (B) Climate change
- (C) Greenhouse effect
- (D) Ozone depletion

Correct Ans: B

Solution

⇒ Climate change involves the extended modification of Earth's climate, encompassing alterations in temperature patterns over time.

14. What is the derived physical quantity representing velocity's change with respect to time?

- (A) Acceleration
- (B) Momentum
- (C) Force
- (D) Energy

Correct Ans: A

Solution

∴ Acceleration is a derived physical quantity that represents the rate of change of velocity with respect to time.

15. Which statement correctly describes the use of a micrometer?

- (A)  $LC = \text{Number of total division on Vernier scale} / \text{Value of 1 division on main scale}$
- (B)  $LC = \text{Pitch distance of screw} / \text{Number of total division on circular scale}$
- (C)  $LC = \text{Value of 1 division on main scale} / \text{Number of total division on Vernier scale}$
- (D)  $LC = \text{Number of total division on circular scale} / \text{Pitch distance of screw}$

Correct Ans: B

Solution

Least count (LC) of Vernier Caliper

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$$LC = \frac{\text{Value of 1 division on main scale}}{\text{number of total division on vernier scale}}$$

Least count (LC) of micrometer

$$LC = \frac{\text{pitch distance of screw}}{\text{number of total division on circular scale}}$$

16. The temperature at which the Celsius and Fahrenheit scales have the same numerical value is

- (A) -40
- (B) 40
- (C) -32
- (D) 32

Correct Ans: A

Solution

Relation between Fahrenheit scale and Celsius scale:

$$T_F = T_C \times \frac{9}{5} + 32$$

Where,

$T_F$  = Temperature on Fahrenheit scale

$T_C$  = Temperature on Celsius scale

Consider  $T_C = -40^\circ\text{C}$ , this value put in above equation

$$T_F = -40 \times \frac{9}{5} + 32$$

$$T_F = -72 + 32$$

$$T_F = -40^\circ\text{F}$$

17. Which of the following salts will result in an acidic solution when dissolved in water?

- (A) Sodium chloride ( $\text{NaCl}$ )
- (B) Potassium nitrate ( $\text{KNO}_3$ )
- (C) Hydrochloric acid ( $\text{HCl}$ )
- (D) Ammonium chloride ( $\text{NH}_4\text{Cl}$ )

Correct Ans: D

Solution

∴ The salt of a weak acid and a strong base, making its solution basic.

∴ The salt of a weak base and a strong acid, making its solution acidic.

∴ Ammonium chloride is the salt of a weak base (ammonia) and a strong acid (hydrochloric acid), making its solution acidic.

18. Unit of temperature gradient is \_\_\_\_\_

- (A) joule
- (B) meters per second
- (C) meter/kelvin



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- (D) kelvin per meter

Correct Ans: D

Solution

Temperature gradient:

=> It is the ratio of the difference in temperature  $\Delta T$  to the distance between two points  $\Delta X$ .

=> Temperature gradient =  $\frac{\Delta T}{\Delta X}$

=> In steady state, temperature gradient is same throughout the distance between two points.

=> SI unit: kelvin per meter (K/m).

19. What was the first generation language?

- (A) Machine Language
- (B) Assembly Language
- (C) PASCAL
- (D) BASIC

Correct Ans: A

Solution

Machine Language (also called 1st Generation Language) is the first and most basic programming language, consisting entirely of binary code (0s and 1s) that a computer's processor can directly execute.

It is hardware-specific, difficult to write, and prone to errors, but it is the fastest language for execution.

20. What is the term for errors that arise from incorrect calibration of the measuring instrument?

- (A) Human errors
- (B) Random errors
- (C) Systematic errors
- (D) Gross errors

Correct Ans: C

Solution

Random errors

=> Random errors are fluctuations in measured data due to various unpredictable factors.

=> Examples: Environmental vibrations.

Systematic errors

=> Systematic errors are errors that occur consistently and repeatedly, causing measurements to be consistently affected in the same manner.

=> Examples: Incorrect zero calibration, Incorrect calibration of the measuring instrument, Reading a scale at an angle, Inconsistent use of a measuring instrument.

Therefore, from the above explanation the correct option is (C) Systematic errors.

21. Which salt is commonly used as a preservative in food and has the chemical formula  $NaCl$ ?

- (A) Sodium chloride
- (B) Sodium nitrate

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- (C) Sodium carbonate
- (D) Sodium sulfate

Correct Ans: A

Solution

::::} Sodium chloride, commonly known as table salt, is used as a preservative in food.

22. Compared to covalent compounds, ionic compounds generally have
- (A) Higher solubility in non-polar solvents
  - (B) Lower solubility in non-polar solvents
  - (C) Similar solubility in non-polar solvents
  - (D) Solubility in non-polar solvents cannot be generalized

Correct Ans: B

Solution

::::} Ionic compounds are polar and tend to dissolve better in polar solvents like water, not in non-polar solvents.

23. Which acid is present in lemons?
- (A) Citric acid
  - (B) Acetic acid
  - (C) Hydrochloric acid
  - (D) Sulfuric acid

Correct Ans: A

Solution

::::} Lemons contain 49.2 grams of citric acid per kilogram, which is a high level compared to other citrus fruits.

24. An angular acceleration can be expressed as----- —
- (A) The rate of change of angular displacement
  - (B) The rate of change of linear displacement
  - (C) The rate of change of linear velocity
  - (D) The rate of change of angular velocity

Correct Ans: D

Solution

::::} An angular acceleration ( $\alpha$ ) is defined as the change in angular velocity ( $\omega$ ) per unit time ( $t$ ).

$$\alpha = \frac{d\omega}{dt}$$

Where,

$\omega$  -Angular Velocity in *rad/ second*

$\alpha$  - Angular acceleration in *rad/second<sup>2</sup>*

$t$  -Time

25. What direction does the centripetal force act on an object that is moving in a circular path?

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- (A) Radially outward from the center
- (B) Radially inward toward the center
- (C) Perpendicular to the plane of motion
- (D) Tangential to the circle

Correct Ans: B

Solution

Centripetal Force:

=> Centripetal force is a force that acts on an object moving in a circular path, directed toward the center around which the object is moving.

Centrifugal Force:

=> Centrifugal force is a force that acts on an object moving in a circular path, directed outward from the center around which the object is moving.

26. How are audible waves different from ultrasonic waves?

- (A) Audible waves can be heard by humans, while ultrasonic waves cannot
- (B) Audible waves travel faster than ultrasonic waves
- (C) Audible waves have higher frequencies than ultrasonic waves
- (D) Audible waves have shorter wavelengths than ultrasonic waves

Correct Ans: A

Solution

Audible waves

=> Sound waves has frequency range 20 Hz to 20 kHz is called Audible waves.

=> Audible waves can be heard by humans.

Ultrasonic wave

=> Sound waves has frequency more than 20 kHz is called Ultrasonic waves.

=> Ultrasonic waves cannot be heard by humans

=> Both audible and ultrasonic waves travel at the speed of sound in a given medium.

27. Which material is most likely to generate a strong echo?

- (A) Fabric
- (B) Cork
- (C) Carpet
- (D) Concrete

Correct Ans: D

Solution

Echo

=> Echo refers to the repetition of sound caused by reflection from an obstacle.

=> Concrete is a rigid and compact substance that effectively bounces back sound waves, resulting in a pronounced echo, unlike softer materials such as carpet, fabric, or cork which tend to absorb sound.

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28. What will the function key F10 do when pressed in Ms Excel?
- (A) Turns extend mode on or off.
  - (B) Creates a chart of the data in the current range in a separate Chart sheet.
  - (C) Turns key tips on or off.
  - (D) Calculates all worksheets in all open workbooks.

Correct Ans: C

### Solution

::::} Pressing F10 in Microsoft Excel activates Key Tips, which display shortcut keys for the ribbon commands.  
--7 This allows users to navigate the ribbon and access commands using the keyboard. When pressed again, it turns the Key Tips off.

29. In PowerPoint, the box that appears below each slide, that displays text content for speakers is
- 
- (A) Slide pane
  - (B) Script pane
  - (C) Notes pane
  - (D) Source pane

Correct Ans: C

### Solution

::::} The Notes pane in PowerPoint appears below each slide and is used to add text content or notes for the speaker. These notes are not visible to the audience during a presentation but can assist the speaker during delivery.

30. \_\_\_\_\_ is the time required to complete one cycle of a wave.
- (A) Wavelength
  - (B) Amplitude
  - (C) Frequency
  - (D) Periodic time

Correct Ans: D

### Solution

Time Period:

::::} It is the time required to complete one cycle of a wave.

::::} It is denoted by  $T$

::::} Unit: second  $s$

::::} Relation between  $T$  and  $f$ :

$$f = \frac{1}{T}$$

31. What is the standard unit of work in the International System of Units (SI)?
- (A) Newton

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- (B) Watt
- (C) Joule
- (D) Watt Meter per second squared

Correct Ans: C

Solution

∴} Work is defined as the product of force and displacement in the direction of the force.

∴} The International System of Units (SI) utilizes the Joule (J) as the designated unit of measurement for work.

32. What is the Fahrenheit scale temperature for the freezing of water?

- (A)  $40^{\circ}F$
- (B)  $0^{\circ}F$
- (C)  $32^{\circ}F$
- (D)  $212^{\circ}F$

Correct Ans: C

Solution

∴} In Fahrenheit scale water freezes at  $32^{\circ}F$ .

Note:

=? Temperature of boiling point of water is  $212^{\circ}F$  or  $100^{\circ}C$

=? Temperature of freezing point of water (melting point of ice) is  $32^{\circ}F$  or  $0^{\circ}C$

Relation between Fahrenheit scale and Celsius scale:

$$T_p = t_{T_c} + 32$$

Where,

$T_p$  = Temperature on Fahrenheit scale

$T_c$  = Temperature on Celsius scale

33. Which of the following is a vector quantity?

- (A) Mass
- (B) Acceleration
- (C) Speed
- (D) Time

Correct Ans: B

Solution

Vector quantity:

∴} A vector quantity is a type of physical quantity that has both magnitude and direction.

∴} Examples: Displacement, Velocity, Acceleration, Force, and Momentum, etc.

Scalar quantity:

∴} A scalar quantity is a type of physical quantity that have only magnitude and no specific direction.

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=?- Examples: Mass, Time, Volume, Speed, Temperature, etc.

Therefore, from the above explanation the correct option is (B):Acceleration.

34. 0.03380 has \_\_\_\_\_ significant figure.

- (A) 3
- (B) 4
- (C) 5
- (D) 6

Correct Ans: B

### Solution

=?-According to Rule-1, Rule-3 and Rule-4, In the number 0.03380, only the digits 3, 3, 8 and trailing zero are significant means 0.03380 has 4 significant figure.

### Significant Figures:

=?- Counting significant figures is a way of expressing the precision of measured or calculated values.

Common rules for counting significant figures:

Rule 1: Non-zero digits

=?- All non-zero digits are considered significant.

=?- For example, in the number 12345, all the digits (1, 2, 3, 4, 5) are significant.

Rule 2: Zeros between significant figures:

=?- Zeros between significant figures are considered significant.

=?- For example, in the number 7004, all the digits (7, 0, 0, and 4) are significant.

Rule 3: Leading zeros

=?- Leading zeros (zeros to the left of the first non-zero digit) are not considered significant.

=?- For example, in the number 0.00456, only the digits 4, 5, and 6 are significant.

Rule 4: Trailing zeros in a decimal number:

=?-Trailing zeros in a decimal number are considered significant.

=?- For example, in the number 12.300, all the digits (1, 2, 3, and the trailing zeros) are significant.

Rule 5: Trailing zeros in a whole number without a decimal point:

=?-Trailing zeros in a whole number without a decimal point are not considered significant.

=?- For example, in the number 1200, only the digits 1 and 2 are significant.

35. Which of the following mechanisms of heat transfer involves the transfer of heat through the movement of fluid particles?

- (A) Convection
- (B) Radiation
- (C) Induction
- (D) Conduction

Correct Ans: A

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### Solution

#### Heat Transfer

∴} There are three methods of heat transfer: (1) Conduction, (2) Convection, and (3) Radiation.

##### (1) Conduction:

∴} Conduction is the transfer of heat through a material without any movement of the material itself like solid materials.

##### (2) Convection:

∴} Convection involves the transfer of heat by the movement of fluids (liquids or gases) .

##### (3) Radiation:

∴} Radiation is the mode of heat transfer in which heat is radiated or transmitted from one place to another in the form of rays or waves like electromagnetic waves.

∴} In this method of heat transfer that does not require a medium for transmission.

∴} Example: The sun's energy reaches the earth due to radiation.

Therefore, from the above explanation the correct option is (A) Convection.

36. What is the power output of a machine that performs 900 Joules of work in 20 seconds?

- (A) 45 W
- (B) 450 W
- (C) 4.5 W
- (D) 0.45 W

Correct Ans: A

### Solution

$$Power = \frac{Work}{Time}$$

$$Power = \frac{900}{20} = 45 W$$

37. What is the term for the variety of species in a particular ecosystem?

- (A) Ecosystem diversity
- (B) Species diversity
- (C) Genetic diversity
- (D) Biodiversity

Correct Ans: D

### Solution

∴} Biodiversity encompasses the range of species within a specific ecosystem, comprising genetic diversity and ecosystem diversity.

38. \_\_\_\_\_ is the unit used to express conductance.

- (A) 0
- (B) U
- (C) Um
- (D) Om

Correct Ans: B

Solution

Resistance:

=> Resistance of the conductor is the opposition to the flow of current. It is denoted by R.

=> Unit:  $\Omega$

Conductance :

=> Conductance is the offered by the conductor to the flow of current. It is denoted by G.

=> Unit: U or S (siemens)

=> Hence, Conductance is the reciprocal of resistance,  $G = \frac{1}{R}$

Conductivity :

=> Conductivity is also known as specific conductance. It is denoted by  $\sigma$ .

=> Conductivity is the reciprocal of resistivity,  $\sigma = \frac{1}{\rho}$

=> Unit:  $\Omega^{-1}m$  or  $S/m$  (siemens/metre)

39. Ionic compounds often have a characteristic

- (A) Luster
- (B) Odor
- (C) Crystalline structure
- (D) Softness

Correct Ans: C

Solution

=> The ions in an ionic compound arrange themselves in a regular, repeating 3-dimensional lattice, forming crystals.

40. Among these materials, which one has the least thermal conductivity?

- (A) Water
- (B) Air
- (C) Copper
- (D) Glass

Correct Ans: B

Solution

=> Air has relatively low thermal conductivity compared to copper, water, and glass.

Note:

=> Thermal Conductivity:

=> It is a property of a material that describes its ability to conduct heat.

=> Unit: watts/meter -kelvin ( $W/m K$ )

41. Capacitance is directly proportional to:

- (A) Resistance
- (B) Charge



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(C) Current

(D) Voltage

Correct Ans: B

Solution

∴} Capacitance is an inherent characteristic of a capacitor, an electronic device employed for the purpose of storing electrical energy. It signifies the capacity of a capacitor to accumulate electric charge in response to a potential difference (voltage).

∴} Mathematically:  $C = \frac{q}{V}$

∴} SI unit: farad (F)

42. Which acid is found in gastric juice?

(A) Citric acid

(B) Hydrochloric acid

(C) Sulfuric acid

(D) Nitric acid

Correct Ans: B

∴} Gastric acid, gastric juice, or stomach acid is a digestive fluid formed within the stomach lining.

∴} Gastric juice is a unique combination of hydrochloric acid (HCl), lipase, and pepsin, and its main function is to inactivate microorganisms.

43. The phase constant in a wave equation represents:

(A) The initial displacement of the wave

(B) The initial phase angle of the wave

(C) The initial frequency of the wave

(D) The initial velocity of the wave

Correct Ans: B

Solution

Wave equation:  $Y = A(\sin \omega t + kx + \phi)$

Where,

A- Amplitude

k- Wave number, which is related to the wavelength of the wave.

$\omega$ - Angular frequency

x- Displacement

$\phi$ - Phase constant, which represents the initial phase angle of the wave.

44. Which of the following conditions will accelerate the corrosion of metals?

(A) Presence of salt

(B) Low temperature

(C) Dry environment

(D) Absence of oxygen

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Correct Ans: A

Solution

∴} Salt enhances the ability of water to conduct electricity, which speeds up the chemical reactions responsible for corrosion.

45. In a series circuit, the current passing through each resistor is:

- (A) Equal
- (B) Indeterminate
- (C) Zero
- (D) Different

Correct Ans: A

Solution

∴} The current flowing through each resistor remains same in a series circuit.

∴} Formula for equivalent resistance in series:  $R_{eq} = R_1 + R_2 + R_3$

46. If two charges are 3 meters apart and attract each other with a force of 9 N, what would be the force between them if they were 6 meters apart?

- (A) 9 N
- (B) 1.12 N
- (C) 2.25 N
- (D) 4.50 N

Correct Ans: C

Solution

Given data:

∴}  $F_1 = 9\text{ N}$

∴}  $d_1 = 3\text{ m}$

∴}  $d_2 = 6\text{ m}$

According to Coulomb's law

The magnitude of the electrostatic force (F) between two point charges  $F = kQ^2 / r^2$

$F \propto 1/r^2$

$$\frac{F_2}{F_1} = \left(\frac{d_1}{d_2}\right)^2$$

$$F_2 = F_1 \times \left(\frac{d_1}{d_2}\right)^2$$

$$F_2 = 9 \times \left(\frac{3}{6}\right)^2$$

$$F_2 = 2.25\text{ N}$$

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47. A charge experiences a force of  $4\text{ N}$  in an electric field intensity of  $2\text{ N/C}$ . What is the magnitude of the charge?

- (A)  $5\text{ C}$
- (B)  $4\text{ C}$
- (C)  $3\text{ C}$
- (D)  $2\text{ C}$

Correct Ans: D

Solution

Given data:

=> Electric field intensity  $E = 2\text{ N/C}$

=> Force  $F = 4\text{ N}$

The force (F) experienced by a charged particle in an electric field

$$F = qE$$

$$q = \frac{F}{E} = \frac{4}{2} = 2\text{ C}$$

48. Consider the reaction between calcium carbonate ( $\text{CaCO}_3$ ) and nitric acid ( $\text{HNO}_3$ ). Which of the following products is NOT formed?

- (A) Calcium nitrate
- (B) Carbon dioxide
- (C) Water
- (D) Nitric oxide

Correct Ans: D

Solution

=> Nitric oxide (NO) is NOT formed in this reaction.

=> Calcium carbonate reacts with nitric acid to form calcium nitrate ( $\text{Ca}(\text{NO}_3)_2$ ), carbon dioxide ( $\text{CO}_2$ ), and water ( $\text{H}_2\text{O}$ ).

=>  $\text{HNO}_3$  does not decompose to release nitric oxide (NO) under these conditions.

49. What is the primary advantage of wind power in terms of environmental impact?

- (A) Air pollution
- (B) Noise pollution
- (C) Water pollution
- (D) Greenhouse gas emissions

Correct Ans: D

Solution

=> Wind power generation results in limited greenhouse gas emissions when compared to those from fossil fuels.

50. The units used to measure Electric Flux are determined.

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- (A) Coulombs (C)
- (B) Newtons (N)
- (C) Volts (V)
- (D) Newtons per coulomb (N/C)

Correct Ans: A

Solution

**Electric flux :**

=>The SI unit of electric flux is Coulomb(C).

=> It is denoted by  $\Phi$ ;



## Section -II: Aptitude Test

1. Find the unit vector in the direction of the sum of the vectors  $\mathbf{a} = 2\mathbf{i} + 7\mathbf{j}$  and  $\mathbf{b} = \mathbf{i} - 9\mathbf{j}$ .

- (A)  $\frac{2}{\sqrt{13}}\mathbf{i} - \frac{3}{\sqrt{13}}\mathbf{j}$   
 (B)  $\frac{2}{\sqrt{11}}\mathbf{i} - \frac{3}{\sqrt{11}}\mathbf{j}$   
 (C)  $\frac{3}{\sqrt{13}}\mathbf{i} - \frac{2}{\sqrt{13}}\mathbf{j}$   
 (D)  $\frac{2}{\sqrt{11}}\mathbf{i} - \frac{3}{\sqrt{11}}\mathbf{j}$

Correct Ans: C

Solution

Sum of two vectors  $\mathbf{a} + \mathbf{b} = 2\mathbf{i} + 7\mathbf{j} + \mathbf{i} - 9\mathbf{j}$

$$= 3\mathbf{i} - 2\mathbf{j}$$

Unit vector in direction of  $\mathbf{a} + \mathbf{b}$  is given by:

$$= \frac{3\mathbf{i} - 2\mathbf{j}}{\sqrt{3^2 + 2^2}}$$

$$= \frac{3}{\sqrt{13}}\mathbf{i} - \frac{2}{\sqrt{13}}\mathbf{j}$$

2. What is the order of differential equation  $y'' + 6y' - 7 = 0$ ?

- (A) 0  
 (B) 1  
 (C) 2  
 (D) 3

Correct Ans: C

Solution

∴ The differential equation's order is 2 because the highest order derivative it contains is  $y''$ .

3. What is the logarithm of 1 to any base?

- (A) 0  
 (B) 1  
 (C) It's undefined  
 (D) It's infinite

Correct Ans: A

Solution

$\Rightarrow$  The logarithm of 1 with respect to any base always yields 0 because any number raised to the power of 0 equals to 1.

4. If  $\tan \theta < 0$ ,  $\cos \theta < 0$ , then the terminal arm of the angle lies in the quadrant \_\_\_\_\_

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Correct Ans: B

Solution

If  $\tan \theta < 0$

Remember:

All positive in first quadrant  $0^\circ$  to  $90^\circ$

$\sin$  and  $\csc$  positive in second quadrant  $90^\circ$  to  $180^\circ$

$\tan$  and  $\cot$  positive in third quadrant  $180^\circ$  to  $270^\circ$

$\cos$  and  $\sec$  positive in fourth quadrant  $270^\circ$  to  $360^\circ$

5.  $\int 2x \cdot e^{x^2} dx = \underline{\hspace{2cm}}$

- (A)  $e^{x^3} + C$
- (B)  $e^{x^2} + C$
- (C)  $e^x + C$
- (D)  $e^2 + C$

Correct Ans: B

Solution

Use the substitution,  $u = x^2$ ,  $\implies du = 2x$

This transforms the integral into:

$$\therefore \int 2x \cdot e^{x^2} dx = \int e^u du = e^u + C$$

$$\implies \int f(x) dx = e^{x^2} + C$$

6. If  $A = \begin{bmatrix} 3 & 4 \\ 2 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} -2 & -2 \\ 0 & -1 \end{bmatrix}$ , then  $(A + B)^{-1}$

- (A) is a skew-symmetric
- (B) does not exist
- (C)  $\begin{bmatrix} -1 & 1 \\ 1 & -\frac{1}{2} \end{bmatrix}$

## Section -II: Aptitude Test

(D) none of these

Correct Ans: C

Solution

$$\text{If } A = \begin{bmatrix} 3 & 4 \\ 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} -2 & -21 \\ 0 & -1 \end{bmatrix}$$

$$A+B = \begin{bmatrix} 1 & 2 \\ 2 & 0 \end{bmatrix}$$

Adjoint of a Matrix  $(A+B)$  (two by two) matrix can be found by changing values of diagonal elements and changing signs of off-diagonal elements.

$$\text{Adj}(A+B) = \begin{bmatrix} 2 & -21 \\ -2 & 1 \end{bmatrix}$$

Inverse of matrix  $A+B$  is given by:

$$(A+B)^{-1} = \frac{\text{Adj}(A+B)}{|A+B|} = \frac{\begin{bmatrix} 2 & -21 \\ -2 & 1 \end{bmatrix}}{-2}$$

$$(A+B)^{-1} = \begin{bmatrix} -1 & 10.5 \\ 1 & -0.5 \end{bmatrix}$$

7. For the circle equation  $x^2 + y^2 + 6x - 4y - 3 = 0$ , the radius is-----.

(A) 16

(B) 4

(C)  $\sqrt{13}$

(D) 13

Correct Ans: B

Solution

For the general equation of circle  $x^2 + y^2 + 2gx + 2fy + c = 0$ , radius is:

$$\sqrt{g^2 + f^2 - c}$$

By comparing it with given equation we get:

$$g = 3, f = -2 \text{ and } c = -3$$

And the radius is given by:

$$\sqrt{g^2 + f^2 - c}$$

$$= \sqrt{3^2 + (-2)^2 - (-3)}$$

$$= \sqrt{9+4+3}$$

$$= \sqrt{16} = 4$$

8. The range of  $\sin(x)$  is -----.

(A)  $[-1, 1]$



## Section -II: Aptitude Test

- (B)  $[-1, 0]$   
 (C)  $[-2, 2]$   
 (D) None of Above

Correct Ans: A

Solution

∴} The range of a function refers to all the possible values that the function could attain.

∴}  $\sin(x)$  can attain values from -1 to 1 so its range is  $[-1, 1]$

9. If  $A + B = \begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$  and  $A = \begin{bmatrix} 3 & 1 \\ -1 & 1 \end{bmatrix}$  find the matrix  $B$

(A)  $\begin{bmatrix} 3 & 1 \\ -1 & 1 \end{bmatrix}$

(B)  $\begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$

(C)  $\begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$

(D)  $\begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$

Correct Ans: D

Solution

$$B = A + B - A = \begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix} - \begin{bmatrix} 3 & 1 \\ -1 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 1-3 & 3-1 \\ 2-(-1) & 1-1 \end{bmatrix} = \begin{bmatrix} -2 & 2 \\ 3 & 0 \end{bmatrix}$$

∴}  $\begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$

10. What is the value of  $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin x}{x}$  ?

(A)  $\frac{\pi}{2}$

(B)  $\frac{1}{2}$

(C) 1

(D) 0

Correct Ans: A

Solution

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin x}{x} = \frac{\sin \frac{\pi}{2}}{\frac{\pi}{2}} = \frac{1}{\frac{\pi}{2}} = \frac{2}{\pi}$$

## Section -II: Aptitude Test

$$\Rightarrow \frac{1}{\frac{\pi}{2}}$$

$$\Rightarrow \frac{2}{\pi}$$

11. If  $A$  is a square matrix  $A + A^T$  is \_\_\_\_\_ matrix.

- (A) Symmetric
- (B) Skew symmetric
- (C) Diagonal
- (D) Column

Correct Ans: A

Solution

$$\text{If } A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$$

$$A^T = \begin{bmatrix} a_{11} & a_{21} \\ a_{12} & a_{22} \end{bmatrix}$$

$$\text{And } A + A^T = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} + \begin{bmatrix} a_{11} \\ a_{12} \end{bmatrix}$$

$$\Rightarrow A + A^T = \begin{bmatrix} a_{11} + a_{11} & a_{12} + a_{21} \\ a_{21} + a_{12} & a_{22} + a_{22} \end{bmatrix}$$

Which is a symmetric matrix.

12. Solve the equation  $\log(x + 4) = 1$ .

- (A)  $x = 4$
- (B)  $x = 6$
- (C)  $x = 10$
- (D)  $x = 2$

Correct Ans: B

Solution

$$\log(x + 4) = 1$$

$$\Rightarrow \log_{10}(x + 4) = 1$$

$$\Rightarrow 10^1 = x + 4$$

$$\therefore x = 6$$

## Section -II: Aptitude Test

13. Which of the following functions can be effectively differentiated using logarithmic differentiation?

- (A)  $f(x) = x^2 - 2x + 4$
- (B)  $f(x) = ex$
- (C)  $f(x) = \sin(x)$
- (D)  $f(x) = \tan(x)$

Correct Ans: B

Solution

=> Logarithmic differentiation proves highly effective when dealing with functions that feature exponentials, logarithms, products, and quotients.

--> For instance,  $ex$  presents an ideal case for employing logarithmic differentiation due to its exponential nature.

14.  $I = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x \, dx =$

- (A) 0
- (B) 1
- (C) -1
- (D) 2

Correct Ans: A

Solution

Given:  $I = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x \, dx$

=>  $I = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^2 x \, dx = \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{1 - \cos 2x}{2} \, dx = 0$

15. Find the correct option for the area between the curves  $y = x^2$  and  $y = 2x + 2$  from  $x = 0$  to  $x = 3$

- (A) 3
- (B) 0
- (C) 6
- (D) -3

Correct Ans: C

Solution

=> To determine the area between two curves, integrate the difference between their functions over the specified interval.

--> Let the required area be  $A$ ,

$\Rightarrow A = \int_0^3 (y_2 - y_1) dx = \int_0^3 (2x + 2 - x^2) dx$

$\Rightarrow A = [x^2 + 2x - \frac{x^3}{3}]_0^3 = 6 - 0 = 6$

## Section -II: Aptitude Test

16.  $x = at^2$  and  $y = 2at$  are parametric equations of

- (A) circle  $x^2 + y^2 = r^2$
- (B) parabola  $y^2 = 4ax$
- (C) ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- (D) ellipse  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

Correct Ans: B

Solution

$x = at^2$  and  $y = 2at$  as given:

Using  $y = 2at \implies t = \frac{y}{2a}$

$$\implies x = a \times \left(\frac{y}{2a}\right)^2 = a \times \frac{y^2}{4a^2}$$

$$\implies x = \frac{y^2}{4a}$$

$$\implies y^2 = 4ax$$

17. If  $\sec x = \frac{1}{2}$  and  $x$  lies in 4th quadrant, then  $\cot x =$  \_\_\_\_\_.

- (A)  $\frac{2}{3}$
- (B)  $-\frac{15}{2}$
- (C)  $\frac{3}{2}$
- (D)  $-1\frac{3}{5}$

Correct Ans: B

Solution

$$\sec^2 x - \tan^2 x = 1$$

$$\tan^2 x = \sec^2 x - 1$$

$$\tan^2 x = \frac{1}{4} - 1 = \frac{1-4}{4} = -\frac{3}{4}$$

$$\tan x = \pm \frac{\sqrt{3}}{2}$$

$\tan x$  is negative in 4th quadrant, so  $\tan x = -\frac{\sqrt{3}}{2}$

$$\cot x = \frac{1}{\tan x} = -\frac{2}{\sqrt{3}}$$

18. Choose the correct answer for  $I = \int 4x^3(\cos x^4 + 9) dx$

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- (A)  $\sin x^3 + x^4 + C$
- (B)  $\sin x^4 + x^4 + C$
- (C)  $\sin x^4 + 9x^4 + C$
- (D)  $\sin x^3 + 9x^4 + C$

Correct Ans: C

Solution

Give:  $I = 4x^3(\cos x^4 + 9) dx$

=? Use method of integration by substitution,

--+ Take  $x^4 = u$   $\implies 4x^3 dx = du$

$$\implies \int 4x^3 (\cos x^4 + 9) dx = \int (\cos u + 9) du = \sin u + 9u + C$$

$$\therefore I = \sin x^4 + 9x^4 + C$$

19. For a given square matrix, changing the rows into columns and the columns into rows will

- (A) Change determinant
- (B) Not change determinant
- (C) Can't say
- (D) Change sign of determinant

Correct Ans: B

Solution

=? The value of the determinant is not altered by changing the rows into columns and the columns into rows.

20. If vectors  $u$  and  $v$  are parallel vectors then

- (A)  $u \times v = 0$
- (B)  $u \times v = l$
- (C)  $u \times v = 2$
- (D)  $u \cdot v = 0$

Correct Ans: A

Solution

vectors  $u$  and  $v$  are parallel vectors if

(1)  $u = kv$ , Where,  $k$  is scalar

(2)  $u \times v = |u||v| \sin \theta = 0$ , Where  $\theta$  is the angle between  $u$  and  $v$ .

(3)  $u \cdot v = |u||v| \cos \theta = |u||v|$ , Where  $\theta$  is the angle between  $u$  and  $v$ .

## Section -II: Aptitude Test

21. If  $y = x^x$ , find the  $\frac{dy}{dx}$

- (A)  $(\ln x + 1)$
- (B)  $xx(\ln x + 1)$
- (C)  $x(\ln x + 1)$
- (D)  $xx(\ln x)$

Correct Ans: B

Solution

∴ Using logarithmic differentiation, take the natural log of both sides:

$$y = x^x \implies \log y = x \ln x$$

Differentiate it,  $u = x$ ,  $y = \ln x$

$$\implies \frac{dy}{y} = u'v + uv' = (1 \cdot \ln x) + (x \cdot \frac{1}{x})$$

$$\implies \frac{dy}{y} = y(\ln x + 1) = xx(\ln x + 1)$$

22. The quantity of donut holes in a bag fluctuates as per below numbers. Find the mode. The quantities observed are: 12, 10, 10, 10, 13, 12, 11, 13, 10.

- (A) 10
- (B) 11
- (C) 12
- (D) 13

Correct Ans: A

Solution

∴ In order to determine the mode, we seek the number that occurs most frequently within the given data set. In this instance:

12, 10, 10, 10, 13, 12, 11, 13, 10

∴ The number 10 appears three times, surpassing the frequency of all other numbers. Thus, the mode for the number of donut holes in a bag at Donuts is 10.

23. Find the derivative of  $f(x) = x^2 + 2x + 1$

- (A)  $2x$
- (B)  $x^2 + 2x + 1$
- (C)  $x^2 + x$
- (D)  $x^2 + 2x$

Correct Ans: D

## Section -II: Aptitude Test

### Solution

Using the quotient rule:  $u = x^2$        $v = x + 1$

$$\left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$$

where,

$$u'(x) = 2x, \quad v'(x) = 1$$

$$\therefore f'(x) = \left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$$

$$= \frac{2x(x+1) - (x^2)(1)}{(x+1)^2} = \frac{2x^2 + 2x - x^2}{(x+1)^2} = \frac{x^2 + 2x}{(x+1)^2}$$

24. The positive integer  $n$  so that  $\lim_{x \rightarrow 3} \frac{x^n - 3^n}{x - 3} = 108$ .

(A) 3

(B) 4

(C) -2

(D) 1

Correct Ans: B

### Solution

$$\begin{aligned} \lim_{x \rightarrow 3} \frac{x^n - 3^n}{x - 3} &= n(3)^{n-1} \\ \lim_{x \rightarrow 3} \frac{x^n - 3^n}{x - 3} &= n(3)n^{-1} = 108 \\ \implies n(3)n^{-1} &= 108 \\ \implies n(3)n^{-1} &= 4(3)4^{-1} \\ \implies n &= 4 \end{aligned}$$

25. The angle between the line  $y = \underline{\hspace{1cm}} x + 1$ , and the x-axis is-----.

(A)  $30^\circ$

(B)  $45^\circ$

(C)  $60^\circ$

(D)  $90^\circ$

Correct Ans: B

### Solution

The angle between the line  $y = mx + c$ , and the x-axis is:

$$\theta = \tan^{-1}(m)$$

$$\theta = \tan^{-1}(1) = 45^\circ$$

26. Which is an example of downward communication in an organization?

(A) A memo from an employee to a supervisor

(B) A meeting between two managers

## Section -II: Aptitude Test

- (C) A supervisor giving instructions to employees
- (D) An employee group chat

Correct Ans: C

### Solution

∴} Downward communication involves messages from higher to lower levels in the organizational hierarchy, such as a supervisor instructing employees.

27. "Me" and "I" are pronouns, but they have different uses. Which sentence uses "me" correctly?
- (A) Sarah and me went to the movies.
  - (B) It was just John and I at the party.
  - (C) Can you help John and me?
  - (D) Let's go to the store, you and me.

Correct Ans: C

### Solution

∴} "Me" is used after a preposition like "between" or "with." "I" is used as the subject of a sentence.

28. Identify the correct sentence with an appropriate adjective form:
- (A) She is the most cleverest of the group.
  - (B) She is the cleverest of the group.
  - (C) She is cleverer than anyone in the group.
  - (D) She is clever than anyone in the group.

Correct Ans: B

### Solution

∴} "Cleverest" is the superlative form, and the superlative does not require "most" when it already ends in "- est."

29. Pas sage :

The ocean covers over 70% of Earth's surface and holds a vast array of life forms. From microscopic plankton to majestic whales, the ocean is teeming with biodiversity. It plays a vital role in regulating the planet's climate, absorbing large amounts of carbon dioxide from the atmosphere. Additionally, the ocean provides us with food, resources, and opportunities for recreation and scientific exploration.

Q.1: What is the passage mainly about?

Q.2: What is one of the ocean's crucial roles?

- (A) Ans.1: The importance of clean water  
Ans.2: Providing resources for human consumption
- (B) Ans.1: The variety of life found in the ocean  
Ans.2: Regulating Earth's climate



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(C) Ans.1: The impact of climate change on oceans

Ans.2: Supporting recreational activities

(D) Ans.1: The benefits of exploring the ocean

Ans.2: Fostering scientific discoveries

Correct Ans: B

Solution:

::::} Explanation 1 :Option B accurately reflects the passage's description of the ocean's biodiversity

::::} Explanation 2 :The passage highlights the ocean's role in climate regulation through carbon dioxide absorption

30. After a job interview, the follow-up email should primarily:

(A) Discuss salary expectations

(B) Mention personal issues

(C) Express gratitude for the opportunity

(D) Demand immediate results

Correct Ans: C

Solution

::::} A follow-up email should focus on expressing gratitude for the opportunity, reiterating interest in the position, and thanking the interviewer for their time.

31. Choose a proper verb form to complete the following sentence.

Have you ever \_\_\_\_ a white tiger ?

(A) see

(B) seen

(C) saw

(D) show

Correct Ans: B

Solution

::::} The sentence uses the present perfect tense ("Have you ever..."), which requires the past participle form of the verb. The correct sentence is "Have you ever seen a white tiger?"

32. In a business proposal, the executive summary should:

(A) Present the company's history

(B) Outline the main points of the proposal

(C) Provide a detailed budget

(D) Include an in-depth analysis

Correct Ans: B

Solution

::::} The executive summary should provide an overview of the proposal's main points for quick understanding, enabling the reader to grasp the purpose and content without reading the entire document.

## Section -II: Aptitude Test

33. What does the "encoding" process in communication involve?

- (A) Interpreting the message
- (B) Decoding the message
- (C) Creating a message and sending it
- (D) Understanding the feedback

Correct Ans: C

Solution

=> Encoding is the process of converting ideas or thoughts into a message that can be transmitted to the receiver.

34. When writing a professional email, it is important to:

- (A) Avoid clear subject lines
- (B) Include personal anecdotes
- (C) Keep the tone formal and professional
- (D) Use a conversational tone

Correct Ans: C

Solution

=> A professional email should maintain a formal tone, avoid unnecessary personal details, and include a clear subject line for clarity and professionalism.

35. Choose an appropriate modal auxiliary for the following sentence. God

\_\_\_\_\_ bless you !

- (A) Will
- (B) May
- (C) Can
- (D) Might

Correct Ans: B

Solution

=> The sentence expresses a wish or hope, which is best conveyed using "may." The correct sentence is "May God bless you!"

36. In writing technical instructions, the language should be:

- (A) Overly detailed with long paragraphs
- (B) Vague and complex
- (C) Simple, clear, and action-oriented
- (D) Full of jargon

Correct Ans: C

Solution

=> Technical instructions should be simple, clear, and action-oriented to ensure that the reader can easily understand and follow the steps.

## Section -II: Aptitude Test

37. In communication, the term "medium" refers to:
- (A) The physical space where communication occurs
  - (B) The device or channel used to convey the message
  - (C) The speaker's tone of voice
  - (D) The facial expressions used

Correct Ans: B

Solution

=> Medium is the channel or device used to transmit the message, such as email, phone, or face-to-face conversation.

38. Choose an appropriate model auxiliary for the following sentence.

Every one \_\_\_\_\_ keep surrounding clean.

- (A) can
- (B) should
- (C) could
- (D) none of the above

Correct Ans: B

Solution

=> The sentence is giving a suggestion or a piece of advice about a duty or obligation, making "should" the most appropriate choice. The correct sentence is "Everyone should keep the surroundings clean."

39. In a professional invitation letter, it is most important to:

- (A) Add unnecessary background information
- (B) Focus on casual details
- (C) Clearly mention the event's time, date, and location
- (D) Avoid addressing the recipient by name

Correct Ans: C

Solution

=> A professional invitation should clearly mention essential details such as the time, date, and location of the event to ensure clarity and prevent confusion.

40. Choose the sentence with the correct form of verb:

- (A) He has wrote the report by himself.
- (B) He have written the report by himself.
- (C) He has written the report by himself.
- (D) He had written the report by himself.

Correct Ans: C

Solution

=> The present perfect tense requires "has" followed by the past participle "written." "Wrote" is the simple past tense, which is incorrect in this case.

## Section -II: Aptitude Test

41. Which sentence is correctly punctuated?
- (A) Let's go to the market, buy some fruit, and make lunch.
  - (B) Let's go to the market buy some fruit, and make lunch.
  - (C) Let's go to the market, buy some fruit and, make lunch.
  - (D) Let's go to the market, buy some fruit and make lunch.

Correct Ans: D

### Solution

=>The sentence needs commas between elements in a series. Option D correctly punctuates the series with only necessary commas.

## 42. Passage:

Sustainability refers to meeting the present needs of society without compromising the ability of future generations to meet their own needs. It encompasses various aspects, including environmental protection, responsible resource use, and social equity. Implementing sustainable practices requires individual and collective efforts to ensure a healthy planet and a just society for future generations.

Q.1: What is the central theme of the passage?

Q.2: What is NOT a dimension of sustainability mentioned?

- (A) Ans.1: Environmental protection for future generations  
Ans.2: Responsible use of resources
- (B) Ans.1: Balancing economic growth with social responsibility Ans.2:  
Promoting individual rights over environmental concerns
- (C) Ans.1: Maintaining current resource consumption levels  
Ans.2: Ensuring a healthy planet for future generations
- (D) Ans.1: Emphasizing individual efforts over collective action  
Ans.2: Prioritizing economic development over social welfare

Correct Ans: B

### Solution

=> Explanation 1 :Option B captures the essence of sustainability - balancing present needs with future generations' well-being

=> Explanation 2 :The passage focuses on environmental protection, resource use, and social equity, not individual rights

43. Choose a proper verb form to complete the following sentence. A  
stitch in time                      nine.
- (A) saves
  - (B) save
  - (C) sew
  - (D) sewing

## Section -II: Aptitude Test

Correct Ans: A

Solution

::::} The sentence is a common proverb, "A stitch in time saves nine," which means that taking prompt action can prevent more significant problems later. The subject "A stitch" is singular, so the correct verb form is singular as well.

44. Which of the following factors can distort or interfere with communication?

- (A) Feedback
- (B) Noise**
- (C) Clarity
- (D) Context

Correct Ans: B

Solution

::::} Noise refers to any interference that disrupts or distorts the communication process, making it harder to understand the message.

45. Pas sage :

Automation refers to the use of technology to perform tasks traditionally done by humans. It has significantly impacted various industries, leading to increased efficiency and productivity. However, concerns arise regarding potential job displacement and the need for individuals to develop new skills to adapt to an evolving job market.

Q.1: What is the main consequence of automation discussed?

Q.2: What is **NOT** directly mentioned as an advantage of automation?

- (A) Ans.1: Increased production costs  
Ans.2: Enhanced human creativity and problem-solving skills
- (B) Ans.1: Improved product quality  
Ans.2: Increased efficiency and productivity in various tasks**
- (C) Ans.1: Potential job displacement for humans  
Ans.2: Improved working conditions for human employees
- (D) Ans.1: Requirement for stricter regulations on technology  
Ans.2: Reduced cost of production for businesses

Correct Ans: C

Solution

::::} **Explanation 1** :The passage highlights the potential negative impact of automation on employment

::::} **Explanation 2** :The passage focuses on efficiency and productivity, not improved working conditions

46. Which type of communication is most prone to distortion?

- (A) Written communication
- (B) Formal communication**

## Section -II: Aptitude Test

- (C) Verbal communication
- (D) Visual communication

Correct Ans: C

Solution

::::} Verbal communication, especially when informal, can be easily distorted by tone, emotion, and non-verbal cues, impacting message accuracy.

### 47. Passage:

Persuasion is the act of influencing the beliefs, attitudes, or behaviors of others. It involves effective communication, understanding the audience, and presenting arguments in a compelling manner. Persuasion plays a crucial role in various aspects of life, from marketing and advertising to negotiations and political campaigns.

Q.1: What is the primary focus of the passage?

Q.2: What is NOT essential for successful persuasion, according to the passage?

- (A) Ans.1: The different types of persuasive techniques  
Ans.2: Understanding the audience's perspective
- (B) Ans.1: The ethical considerations in using persuasion  
Ans.2: Presenting compelling arguments effectively
- (C) Ans.1: The importance of effective communication in persuasion  
Ans.2: Using complex and technical language
- (D) Ans.1: The impact of persuasion on individuals and society  
Ans.2: Employing ethical and responsible communication

Correct Ans: C

Solution

::::} **Explanation 1** :Option C accurately reflects the passage's emphasis on communication and effective presentation in persuasion

::::> **Explanation 2** :The passage highlights the importance of clear, not complex, communication for persuasion

### 48. Select the correct word choice:

- (A) I will meet you at the station at 5 p.m. tomorrow.
- (B) I will meet you in the station at 5 p.m. tomorrow.
- (C) I will meet you on the station at 5 p.m. tomorrow.
- (D) I will meet you by the station at 5 p.m. tomorrow.

Correct Ans: A

Solution

::::>The correct preposition is "at" when referring to specific locations like "the station." "In," "on," and "by" are incorrect in this context.

## Section -II: Aptitude Test

49. Choose the correct sentence with the appropriate use of conjunction:

- (A) I want to go for a walk, but it is raining.
- (B) I want to go for a walk, although it is raining.
- (C) I want to go for a walk, so it is raining.
- (D) I want to go for a walk, and it is raining.

Correct Ans: A

Solution

=> "But" is the correct conjunction for introducing a contrast between the desire to walk and the rain. The other conjunctions do not fit the intended meaning.

50. **Passage:**

Critical thinking is the ability to analyze information objectively, evaluate arguments, and form independent judgments. It involves questioning assumptions, identifying biases, and considering different perspectives. Critical thinking skills are crucial for making informed decisions, solving problems effectively, and adapting to a complex world.

Q.1: What is the main benefit of critical thinking highlighted in the passage? Q.2: What is NOT a characteristic of critical thinking according to the passage?

- (A) Ans.1: Enhanced creativity and problem-solving skills  
Ans.2: Identifying and challenging personal biases
- (B) Ans.1: Improved memory and information recall  
Ans.2: Applying knowledge and skills to new situations
- (C) Ans.1: Increased confidence and self-esteem  
Ans.2: Considering various perspectives and viewpoints
- (D) Ans.1: Ability to form independent judgments and make informed decisions  
Ans.2: Accepting information at face value without evaluation

Correct Ans: D

Solution

=> **Explanation 1** :Option D captures the essence of critical thinking - evaluating information and forming independent judgments

=> **Explanation 2** :