TS EDCET 2025 June 1 Shift 1 Question Paper with Solution

Time Allowed :3 Hours	**Maximum Marks :**150	**Total Questions :**150

General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper comprises 160 questions.
2. The Paper is divided into 12 parts- Biology, Physics and Chemistry.
3. There are 40 questions in Physics, 40 questions in Chemistry and 80 questions in Biology.
4. For each correct response, candidates are awarded 1 marks.

1 Mathematics

1. If $\log\left(\frac{x+y}{3}\right) = \frac{1}{2}(\log x + \log y)$ **then the value of** $\frac{x}{y} + \frac{y}{x}$ **= ?**
(A) 7
(B) 8
(C) -7
(D) 9
Correct Answer: (A) 7

Solution:
Given the equation: $\log\left(\frac{x+y}{3}\right) = \frac{1}{2}(\log x + \log y)$.

Using the logarithm property $\log a + \log b = \log(ab)$, we can rewrite the right side.

$\log\left(\frac{x+y}{3}\right) = \frac{1}{2}\log(xy)$.

Using the property $n \log a = \log(a^n)$, we get:

$\log\left(\frac{x+y}{3}\right) = \log\left((xy)^{\frac{1}{2}}\right)$.

$\log\left(\frac{x+y}{3}\right) = \log(\sqrt{xy})$.

Since the logarithms on both sides have the same base, their arguments must be equal.

$\frac{x+y}{3} = \sqrt{xy}$.

Squaring both sides of the equation:

$\left(\frac{x+y}{3}\right)^2 = (\sqrt{xy})^2$.

$\frac{(x+y)^2}{9} = xy$.

Expand the term $(x+y)^2$:

$\frac{x^2+y^2+2xy}{9} = xy$.

Multiply both sides by 9:

$x^2 + y^2 + 2xy = 9xy$.

Subtract $2xy$ from both sides to isolate $x^2 + y^2$:

$x^2 + y^2 = 9xy - 2xy$.

$x^2 + y^2 = 7xy$.

To find the value of $\frac{x}{y} + \frac{y}{x}$, divide the entire equation by xy:

$\frac{x^2+y^2}{xy} = \frac{7xy}{xy}$.

$\frac{x^2}{xy} + \frac{y^2}{xy} = 7$.

$\frac{x}{y} + \frac{y}{x} = 7$.

Quick Tip

Master the fundamental properties of logarithms: $\log a + \log b = \log(ab)$, $\log a - \log b = \log(a/b)$, and $n \log a = \log(a^n)$. These are essential for simplifying logarithmic equations.

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2. The number of positive divisors of 68600 is
(A) 48
(B) 24
(C) 18
(D) 8
Correct Answer: (A) 48

Solution:
To find the number of positive divisors, we first need to find the prime factorization of the number 68600.

We can write 68600 as 686×100.

First, let's factorize 100:

$100 = 10^2 = (2 \times 5)^2 = 2^2 \times 5^2$.

Next, let's factorize 686:

$686 = 2 \times 343$.

Recognize that 343 is a perfect cube: $343 = 7^3$.

So, $686 = 2 \times 7^3$.

Now, combine the prime factors:

$68600 = (2 \times 7^3) \times (2^2 \times 5^2)$.

Group the powers of the same prime bases:

$68600 = 2^{1+2} \times 5^2 \times 7^3 = 2^3 \times 5^2 \times 7^3$.

The formula for the number of divisors of a number $N = p_1^{a_1} \times p_2^{a_2} \times \cdots \times p_k^{a_k}$ is $(a_1 + 1)(a_2 + 1) \ldots (a_k + 1)$.

For $68600 = 2^3 \times 5^2 \times 7^3$, the exponents are 3, 2, and 3.

Number of divisors $= (3 + 1) \times (2 + 1) \times (3 + 1)$.

Number of divisors $= 4 \times 3 \times 4$.

Number of divisors $= 48$.

Quick Tip

To find the number of divisors of any integer, always start by finding its unique prime factorization. Then, add one to each exponent and multiply the results.

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3. Evaluate $\sqrt[3]{1372} \times \sqrt[3]{1458}$
(A) 120
(B) 126
(C) 130
(D) 136
Correct Answer: (B) 126

Solution:
We need to evaluate the expression $\sqrt[3]{1372} \times \sqrt[3]{1458}$.

Using the property of radicals, $\sqrt[n]{a} \times \sqrt[n]{b} = \sqrt[n]{ab}$, we can combine the terms under a single cube root.

$\sqrt[3]{1372 \times 1458}$.

To simplify this, we find the prime factorization of each number.

For 1372:

$1372 = 2 \times 686 = 2 \times 2 \times 343 = 2^2 \times 7^3$.

For 1458:

$1458 = 2 \times 729 = 2 \times 9^3 = 2 \times (3^2)^3 = 2 \times 3^6$.

Now, multiply the prime factorizations:

$1372 \times 1458 = (2^2 \times 7^3) \times (2 \times 3^6)$.

Combine the powers of the same bases:

$= 2^{2+1} \times 3^6 \times 7^3 = 2^3 \times 3^6 \times 7^3$.

Now, take the cube root of this product:

$\sqrt[3]{2^3 \times 3^6 \times 7^3}$.

$= \sqrt[3]{2^3} \times \sqrt[3]{3^6} \times \sqrt[3]{7^3}$.

This simplifies to $2^{3/3} \times 3^{6/3} \times 7^{3/3}$.

$= 2^1 \times 3^2 \times 7^1$.

$= 2 \times 9 \times 7$.

$= 18 \times 7 = 126$.

Quick Tip

When multiplying roots of the same order, prime factorization is your best friend. It helps you identify perfect powers that can be easily extracted from the radical sign.

4. If A = {x : x is a letter of the word MISSISSIPPI} then n(A) =
(A) 4
(B) 8
(C) 9
(D) 11
Correct Answer: (A) 4

Solution:
The problem asks for $n(A)$, which represents the number of elements (cardinality) in the set A.

The set A is defined as the set of letters in the word MISSISSIPPI.

A set contains only unique elements. We need to list the distinct letters from the word.

The letters in MISSISSIPPI are M, I, S, S, I, S, S, I, P, P, I.

Let's identify the unique letters:

M

I

S

P

The set A can be written in roster form as A = {M, I, S, P}.

Now, we count the number of elements in set A.

There are 4 distinct elements in the set.

Therefore, $n(A) = 4$.

Quick Tip

In set theory, when forming a set from a list or word with repeated items, remember that each unique item is listed only once. The cardinality, n(A), is the count of these unique items.

5. Gopi sold a watch to Ibrahim at 12% gain and Ibrahim sold it to John at a loss of 5%. If John paid 1,330 then, find how much did Gopi sold it?

(A) 1400
(B) 1500
(C) 1600
(D) 1700
Correct Answer: (A) 1400

Solution:
Let's work backward from the final price paid by John.

John paid 1,330. This is the selling price for Ibrahim.

Ibrahim sold the watch to John at a 5% loss.

This means that the price John paid (1,330) is $100\% - 5\% = 95\%$ of what Ibrahim originally paid for the watch.

Let Ibrahim's Cost Price (CP) be $C_{Ibrahim}$.

Then, $C_{Ibrahim} \times \frac{95}{100} = 1330$.

$C_{Ibrahim} = 1330 \times \frac{100}{95}$.

$C_{Ibrahim} = \frac{133000}{95}$.

$C_{Ibrahim} = 1400$.

So, Ibrahim's Cost Price was 1400.

Ibrahim bought the watch from Gopi. Therefore, the selling price for Gopi is the cost price for Ibrahim.

The question asks how much did Gopi sold it?, which means we need to find Gopi's selling price.

Gopi's Selling Price = Ibrahim's Cost Price = 1400.

Quick Tip

In successive profit/loss problems, working backward from the final price is often the most direct method. The selling price of one person is the cost price for the next person in the chain.

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6. Rani read $\frac{3}{5}$ of a book. If she finds that there are still 80 pages left to read, then the total number of pages in the book is

(A) 150
(B) 200
(C) 250
(D) 300
Correct Answer: (B) 200

Solution:
Let the total number of pages in the book be T.

The fraction of the book Rani read is $\frac{3}{5}$.

The fraction of the book remaining to be read is $1 - \frac{3}{5}$.

Fraction remaining $= \frac{5}{5} - \frac{3}{5} = \frac{2}{5}$.

We are given that the number of pages left to read is 80.

So, $\frac{2}{5}$ of the total pages is equal to 80.

We can write this as an equation: $\frac{2}{5} \times T = 80$.

To find T, multiply both sides by $\frac{5}{2}$.

$T = 80 \times \frac{5}{2}$.

$T = 40 \times 5$.

$T = 200$.

Therefore, the total number of pages in the book is 200.

Quick Tip

When dealing with fractions of a whole, remember that the remaining fraction is always 1 minus the used fraction. Set up a simple equation to solve for the total amount.

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7. The average of the squares of first 50 natural numbers is
(A) $\frac{1817}{2}$
(B) $\frac{1717}{2}$
(C) $\frac{1517}{2}$
(D) $\frac{1617}{2}$
Correct Answer: (B) $\frac{1717}{2}$

Solution:
The sum of the squares of the first n natural numbers is given by the formula:

Sum $= \frac{n(n+1)(2n+1)}{6}$.

The average of these squares is the sum divided by the number of terms, n.

Average $= \frac{\text{Sum}}{n} = \frac{n(n+1)(2n+1)}{6n} = \frac{(n+1)(2n+1)}{6}$.

In this problem, we need to find the average for the first 50 natural numbers, so $n = 50$.

Substitute $n = 50$ into the average formula:

Average $= \frac{(50+1)(2\times50+1)}{6}$.

Average $= \frac{(51)(100+1)}{6}$.

Average $= \frac{51\times101}{6}$.

We can simplify the fraction by dividing 51 and 6 by their common factor, 3.

Average $= \frac{17\times101}{2}$.

Now, calculate the product in the numerator: $17 \times 101 = 1717$.

So, the average is $\frac{1717}{2}$.

Quick Tip

Memorize the formulas for the sum of the first n natural numbers, their squares, and their cubes. The formula for the average of the first n squares is simply $\frac{(n+1)(2n+1)}{6}$.

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8. Find the simple interest on 15,000 at the rate of 8% per annum for 2 years (in Rupees)
(A) 4200
(B) 2400
(C) 2500
(D) 2200
Correct Answer: (B) 2400

Solution:
The formula for Simple Interest (SI) is given by:

$SI = \frac{P \times R \times T}{100}$

Where:

P = Principal amount = 15,000

R = Rate of interest per annum = 8%

T = Time period in years = 2 years

Substitute the given values into the formula:

$SI = \frac{15000 \times 8 \times 2}{100}$.

Cancel out the two zeros from the numerator and the denominator:

$SI = 150 \times 8 \times 2$.

First, multiply 150×8:

$150 \times 8 = 1200$.

Now, multiply the result by 2:

$SI = 1200 \times 2 = 2400$.

The simple interest is 2400.

Quick Tip

For simple interest calculations, you can also calculate the interest for one year ($15000 \times 8\% = 1200$) and then multiply by the number of years ($1200 \times 2 = 2400$).

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9. The roots of the equation $x^4 - 5x^2 + 4 = 0$ are
(A) -2, 1, -2, -1
(B) 2, -1, -2, 1
(C) -2, -1, -1, -2
(D) 2, 1, 1, 2
Correct Answer: (B) 2, -1, -2, 1

Solution:
The given equation is a biquadratic equation: $x^4 - 5x^2 + 4 = 0$.

This can be solved by treating it as a quadratic equation in terms of x^2.

Let $y = x^2$. The equation becomes:

$y^2 - 5y + 4 = 0$.

Now, we factorize this quadratic equation. We need two numbers that multiply to 4 and add up to -5. These numbers are -4 and -1.

$(y - 4)(y - 1) = 0$.

This gives two possible values for y:

$y = 4$ or $y = 1$.

Now, we substitute back x^2 for y.

Case 1: $x^2 = y = 4$.

Taking the square root of both sides, we get $x = \pm\sqrt{4}$, so $x = 2$ and $x = -2$.

Case 2: $x^2 = y = 1$.

Taking the square root of both sides, we get $x = \pm\sqrt{1}$, so $x = 1$ and $x = -1$.

The roots of the equation are 2, -2, 1, and -1.

This matches the set of roots given in option (B).

Quick Tip

Equations of the form $ax^{2n} + bx^n + c = 0$ can be simplified by substituting $y = x^n$. Solve the resulting quadratic equation for y, and then solve for x.

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10. If $\frac{3}{x+y} + \frac{12}{2x-y} = \frac{7}{3}$ and $\frac{6}{x+y} + \frac{18}{2x-y} = \frac{11}{3}$ then $x^2 + y^2 =$
(A) 34
(B) 41
(C) 25
(D) 7
Correct Answer: (B) 41

Solution:
Let's simplify the system of equations by making substitutions.

Let $a = \frac{1}{x+y}$ and $b = \frac{1}{2x-y}$.

The equations become:

1) $3a + 12b = \frac{7}{3}$

2) $6a + 18b = \frac{11}{3}$

Multiply equation (1) by 2 to make the coefficient of 'a' the same in both equations.

$2 \times (3a + 12b) = 2 \times \frac{7}{3} \implies 6a + 24b = \frac{14}{3}$ (Equation 3)

Now, subtract equation (2) from equation (3):

$(6a + 24b) - (6a + 18b) = \frac{14}{3} - \frac{11}{3}$.

$6b = \frac{3}{3} = 1$.

$b = \frac{1}{6}$.

Substitute $b = \frac{1}{6}$ into equation (1):

$3a + 12\left(\frac{1}{6}\right) = \frac{7}{3}$.

$3a + 2 = \frac{7}{3}$.

$3a = \frac{7}{3} - 2 = \frac{7-6}{3} = \frac{1}{3}$.

$a = \frac{1}{9}$.

Now, substitute back the original expressions for a and b:

$a = \frac{1}{x+y} = \frac{1}{9} \implies x + y = 9$ (Equation I)

$b = \frac{1}{2x-y} = \frac{1}{6} \implies 2x - y = 6$ (Equation II)

Now we have a simple system of linear equations. Add Equation I and Equation II:

$(x + y) + (2x - y) = 9 + 6$.

$3x = 15 \implies x = 5$.

Substitute $x = 5$ into Equation I:

$5 + y = 9 \implies y = 4$.

Finally, calculate the required value $x^2 + y^2$:

$x^2 + y^2 = 5^2 + 4^2 = 25 + 16 = 41$.

Quick Tip

For systems of equations with complex terms in the denominator, substitution is a powerful technique. Replace the complex fractions with simple variables to transform the problem into a standard linear system.

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11. For ($k \neq 0$), if the quadratic equation $kx(x-2)+6=0$ has two equal roots, then find the value of k?
(A) 2
(B) 4
(C) 6
(D) 8
Correct Answer: (C) 6

Solution:
First, expand the given equation to write it in the standard quadratic form $ax^2 + bx + c = 0$.

$kx(x-2)+6=0$

$kx^2 - 2kx + 6 = 0$.

Here, the coefficients are $a = k$, $b = -2k$, and $c = 6$.

For a quadratic equation to have two equal roots, its discriminant (D) must be equal to zero.

The formula for the discriminant is $D = b^2 - 4ac$.

Set the discriminant to zero: $b^2 - 4ac = 0$.

Substitute the values of a, b, and c:

$(-2k)^2 - 4(k)(6) = 0$.

$4k^2 - 24k = 0$.

Factor out the common term $4k$:

$4k(k-6)=0$.

This gives two possible solutions for k: $4k=0$ or $k-6=0$.

So, $k=0$ or $k=6$.

The problem states that $k \neq 0$.

Therefore, the only valid value for k is 6.

Quick Tip

The condition for a quadratic equation $ax^2+bx+c=0$ having equal roots is that its discriminant, $D=b^2-4ac$, must be zero. This is a fundamental concept in quadratic equations.

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12. If $p(x)=4x^{11}-8x^9+7x^5+6x^3+4x^2+5x+6$ then the number of zeros is
(A) 7
(B) 6
(C) 9
(D) 11
Correct Answer: (D) 11

Solution:
This question relates to the Fundamental Theorem of Algebra.

The theorem states that any non-constant single-variable polynomial with complex coefficients has at least one complex root.

A direct consequence of this theorem is that a polynomial of degree n has exactly n roots (or zeros) in the complex number system, counting multiplicities.

The degree of a polynomial is the highest exponent of its variable.

In the given polynomial, $p(x)=4x^{11}-8x^9+7x^5+6x^3+4x^2+5x+6$.

The highest power of x is 11.

Therefore, the degree of the polynomial $p(x)$ is 11.

According to the Fundamental Theorem of Algebra, the number of zeros of this polynomial is equal to its degree.

Thus, the number of zeros is 11.

Quick Tip

The number of zeros of a polynomial is determined by its degree (the highest exponent of the variable). Don't get distracted by the number of terms or the values of the coefficients.

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13. If $\sin x = \frac{3}{5}$, then $\tan x + \cot x =$
(A) $\frac{12}{5}$
(B) $\frac{5}{12}$
(C) $\frac{25}{12}$
(D) $\frac{12}{25}$
Correct Answer: (C) $\frac{25}{12}$

Solution:
We can solve this using trigonometric identities.

We know that $\tan x = \frac{\sin x}{\cos x}$ and $\cot x = \frac{\cos x}{\sin x}$.

So, $\tan x + \cot x = \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}$.

To add these fractions, find a common denominator, which is $\sin x \cos x$.

$= \frac{\sin^2 x + \cos^2 x}{\sin x \cos x}$.

Using the Pythagorean identity $\sin^2 x + \cos^2 x = 1$, the expression simplifies to:

$= \frac{1}{\sin x \cos x}$.

We are given $\sin x = \frac{3}{5}$.

We need to find $\cos x$. Using the Pythagorean identity again: $\cos x = \sqrt{1 - \sin^2 x}$.

$\cos x = \sqrt{1 - \left(\frac{3}{5}\right)^2} = \sqrt{1 - \frac{9}{25}} = \sqrt{\frac{25-9}{25}} = \sqrt{\frac{16}{25}} = \frac{4}{5}$.

Now substitute the values of $\sin x$ and $\cos x$ into our simplified expression:

$\tan x + \cot x = \frac{1}{\left(\frac{3}{5}\right) \times \left(\frac{4}{5}\right)} = \frac{1}{\frac{12}{25}}$.

$= \frac{25}{12}$.

Quick Tip

The identity $\tan x + \cot x = \frac{1}{\sin x \cos x}$ is very useful. Recognizing and applying it can often be faster than calculating tan x and cot x separately.

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14. The median of the given data is 89, 45, 56, 67, 89, 78, 45, 78, 45, 67
(A) 67.5
(B) 134.5
(C) 67
(D) 56
Correct Answer: (C) 67

Solution:
To find the median, the first step is to arrange the data in ascending order.

The given data set is: 89, 45, 56, 67, 89, 78, 45, 78, 45, 67.

Arranging in ascending order: 45, 45, 45, 56, 67, 67, 78, 78, 89, 89.

Next, count the number of observations, denoted by n.

In this data set, $n = 10$.

Since n is an even number, the median is the average of the two middle values.

The positions of the middle values are $(\frac{n}{2})^{th}$ and $(\frac{n}{2} + 1)^{th}$.

For $n = 10$, these are the $(\frac{10}{2})^{th} = 5^{th}$ term and the $(\frac{10}{2} + 1)^{th} = 6^{th}$ term.

From the ordered list, the 5^{th} term is 67 and the 6^{th} term is 67.

The median is the average of these two terms:

Median $= \frac{67+67}{2} = \frac{134}{2} = 67$.

Quick Tip

Always arrange the data in ascending or descending order before calculating the median. For an even number of data points, the median is the average of the two middle numbers; for an odd number, it is the single middle number.

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15. The area of the triangle whose vertices are A(2,3), B(-1,0) and C(2,-4) (in square units) is
(A) 11.5
(B) 10
(C) 10.5
(D) 11
Correct Answer: (C) 10.5

Solution:
The area of a triangle with vertices (x_1, y_1), (x_2, y_2), and (x_3, y_3) is given by the formula:

Area $= \frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$.

The given vertices are A(2,3), B(-1,0), and C(2,-4).

Let $(x_1, y_1) = (2, 3)$.

Let $(x_2, y_2) = (-1, 0)$.

Let $(x_3, y_3) = (2, -4)$.

Substitute these coordinates into the area formula:

Area $= \frac{1}{2}|2(0 - (-4)) + (-1)(-4 - 3) + 2(3 - 0)|$.

Simplify the expression inside the absolute value:

Area $= \frac{1}{2}|2(4) + (-1)(-7) + 2(3)|$.

Area $= \frac{1}{2}|8 + 7 + 6|$.

Area $= \frac{1}{2}|21|$.

Area $= \frac{21}{2}$.

Area = 10.5 square units.

Quick Tip

A useful shortcut for this formula is the Shoelace Method. Write the coordinates in a column, repeating the first one at the end. Multiply diagonally down-right, sum them up. Multiply diagonally up-right, sum them up. The area is half the absolute difference of these two sums.

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16. Find the total surface area of the cuboid if length is 12 cm, breadth 8 cm and height is 10 cm (in cubic cm.)
(A) 792
(B) 692
(C) 592
(D) 562
Correct Answer: (C) 592

Solution:
The formula for the Total Surface Area (TSA) of a cuboid is:

$\text{TSA} = 2(lb + bh + hl)$

where l is the length, b is the breadth, and h is the height.

We are given the following dimensions:

Length $(l) = 12$ cm

Breadth $(b) = 8$ cm

Height $(h) = 10$ cm

Substitute these values into the TSA formula:

$\text{TSA} = 2 \times ((12 \times 8) + (8 \times 10) + (10 \times 12))$.

Calculate the products inside the parentheses:

$\text{TSA} = 2 \times (96 + 80 + 120)$.

Sum the values inside the parentheses:

$\text{TSA} = 2 \times (296)$.

Perform the final multiplication:

TSA = 592.

The total surface area is 592 cm^2. (Note: The question's unit cubic cm is for volume, while the calculation is for area, which is in square cm).

Quick Tip

Be careful with units. Area is always measured in square units (cm^2, m^2), while volume is measured in cubic units (cm^3, m^3). Exam questions sometimes contain typos in units, so focus on the numerical calculation required.

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17. Match the following: for the data 5, 8, 14, 7, 9, 5, 11, 5

Group – I		Group – II
i) Mean	మధ్యమం	a) 7.5
ii) Median	మధ్యగతం	b) 9
iii) Mode	బాహుళకం	c) 5
iv) Range	వ్యాప్తి	d) 8

(A) i-d, ii-a, iii-c, iv-b
(B) i-a, ii-b, iii-c, iv-d
(C) i-d, ii-c, iii-b, iv-a
(D) i-d, ii-c, iii-a, iv-b
Correct Answer: (A) i-d, ii-a, iii-c, iv-b

Solution:
The given data set is: 5, 8, 14, 7, 9, 5, 11, 5. The number of observations is $n = 8$.

i) Mean: The mean is the sum of all values divided by the number of values.
Sum $= 5 + 8 + 14 + 7 + 9 + 5 + 11 + 5 = 64$.
Mean $= \frac{64}{8} = 8$. This matches (d). So, **i-d**.

ii) Median: First, arrange the data in ascending order.
Ordered data: 5, 5, 5, 7, 8, 9, 11, 14.
Since $n = 8$ (even), the median is the average of the two middle terms (4th and 5th terms).
Median $= \frac{7+8}{2} = \frac{15}{2} = 7.5$. This matches (a). So, **ii-a**.

iii) Mode: The mode is the value that appears most frequently in the data set.
The value 5 appears 3 times, which is more than any other value.
Mode = 5. This matches (c). So, **iii-c**.

iv) Range: The range is the difference between the maximum and minimum values.
Maximum value = 14. Minimum value = 5.

Range $= 14 - 5 = 9$. This matches (b). So, **iv-b**.

The correct matching is i-d, ii-a, iii-c, iv-b.

Quick Tip

To avoid errors in statistics questions: 1. Always order the data for the median. 2. Count the frequency of each number for the mode. 3. Double-check your addition for the mean. 4. Identify the highest and lowest values for the range.

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18. A sector of a circle with radius 14 cm makes an angle 90° at the centre. Then the perimeter of the sector is (in cm)
(A) $14 + 7\pi$
(B) $7 + 14\pi$
(C) $7 + 28\pi$
(D) $28 + 7\pi$
Correct Answer: (D) $28 + 7\pi$

Solution:
The perimeter of a sector of a circle consists of two radii and the arc connecting them.

Perimeter of sector = (Length of radius) + (Length of radius) + (Length of the arc).

Perimeter = $2r$ + Arc Length.

Given: Radius (r) = 14 cm, and the central angle (θ) = 90°.

The formula for the length of an arc is: Arc Length = $\frac{\theta}{360} \times 2\pi r$.

Substitute the given values into the arc length formula:

Arc Length = $\frac{90}{360} \times 2 \times \pi \times 14$.

Simplify the fraction: $\frac{90}{360} = \frac{1}{4}$.

Arc Length = $\frac{1}{4} \times 28\pi$.

Arc Length = 7π cm.

Now, calculate the total perimeter of the sector:

Perimeter = $2r$ + Arc Length = $(2 \times 14) + 7\pi$.

Perimeter $= 28 + 7\pi$ cm.

Quick Tip

A common mistake is to calculate only the arc length when asked for the perimeter of a sector. Remember that the perimeter must also include the two straight sides (the radii).

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19. If two unbiased dice are thrown at a time, then find the probability of getting the sum of the number on the dice is 10?
(A) $\frac{1}{6}$
(B) $\frac{1}{12}$
(C) $\frac{1}{9}$
(D) $\frac{1}{8}$
Correct Answer: (B) $\frac{1}{12}$

Solution:
When two unbiased dice are thrown, the total number of possible outcomes is $6 \times 6 = 36$.

We want to find the probability that the sum of the numbers on the dice is 10.

Let's list the favorable outcomes, i.e., the pairs of numbers that add up to 10.

The possible pairs are:
- (4, 6) - (5, 5) - (6, 4)

There are 3 favorable outcomes.

The probability of an event is calculated using the formula:

$P(\text{Event}) = \frac{\text{Number of Favorable Outcomes}}{\text{Total Number of Possible Outcomes}}$.

$P(\text{sum is } 10) = \frac{3}{36}$.

Simplify the fraction by dividing both the numerator and the denominator by 3.

$P(\text{sum is } 10) = \frac{1}{12}$.

Quick Tip

For two-dice problems, it can be helpful to visualize a 6×6 grid of all possible outcomes. The sums form diagonal patterns, making it easy to count the outcomes for any given sum.

20. One card is drawn from a well shuffled deck of 52 cards. Then the probability that the card will be a face card is ___.
(A) $\frac{1}{13}$
(B) $\frac{3}{13}$
(C) $\frac{5}{13}$
(D) $\frac{7}{13}$
Correct Answer: (B) $\frac{3}{13}$

Solution:
A standard deck of cards has a total of 52 cards.

So, the total number of possible outcomes is 52.

A face card is a King, Queen, or Jack.

There are 4 suits in a deck: Spades, Hearts, Diamonds, and Clubs.

Each suit has 3 face cards (King, Queen, Jack).

Therefore, the total number of face cards in the deck is 4 suits $\times$ 3 face cards/suit = 12.

The number of favorable outcomes (drawing a face card) is 12.

The probability of an event is the ratio of favorable outcomes to the total possible outcomes.

$P(\text{drawing a face card}) = \frac{\text{Number of face cards}}{\text{Total number of cards}}$.

$P(\text{drawing a face card}) = \frac{12}{52}$.

To simplify the fraction, divide both the numerator and the denominator by their greatest common divisor, which is 4.

$P(\text{drawing a face card}) = \frac{12 \div 4}{52 \div 4} = \frac{3}{13}$.

Quick Tip

Memorize the composition of a standard 52-card deck: 4 suits, 13 ranks per suit, 12 face cards (K, Q, J), and 4 aces. This basic knowledge is crucial for solving card-based probability problems quickly.

2 Physical Science

21. The resistor of resistance R is connected between the terminals of a cell of emf E and internal resistance r. The current I through the circuit is
(A) $\frac{E}{Rr}$
(B) $\frac{E}{R+r}$
(C) $\frac{R+r}{E}$
(D) $\frac{E}{R}+r$
Correct Answer: (B) $\frac{E}{R+r}$

Solution:
In the given circuit, the external resistor (resistance R) and the internal resistance of the cell (resistance r) are connected in series.

The total resistance of the circuit is the sum of the external and internal resistances.

Total Resistance (R_{total}) $= R + r$.

The total electromotive force (emf) of the circuit is E.

According to Ohm's Law, the current (I) in a circuit is given by the total voltage (or emf) divided by the total resistance.

$I = \frac{\text{Total EMF}}{\text{Total Resistance}}$.

Substituting the values, we get:

$I = \frac{E}{R+r}$.

Quick Tip

Remember that the internal resistance of a battery or cell always acts in series with the external circuit. Therefore, to find the total resistance, you must add the internal resistance to the external resistance.

---

22. Which waves are used in the device 'SONAR'?
(A) Audible waves
(B) Ultrasound waves
(C) Infrasound waves
(D) Light waves
Correct Answer: (B) Ultrasound waves

Solution:
SONAR stands for SOund Navigation And Ranging.

It is a technique that uses sound propagation to navigate, measure distances (ranging), communicate with or detect objects on or under the surface of the water, such as other vessels.

SONAR systems work by sending out sound waves and then detecting the echoes that return from objects.

The waves used in SONAR are ultrasound waves, which have frequencies higher than the upper audible limit of human hearing (typically above 20 kHz).

Ultrasound is used because its shorter wavelength provides greater resolution and detail in detection, and it is not disturbed by or does not disturb audible marine life or human activities.

Quick Tip

Associate SONAR with water and ultrasound. Similarly, associate RADAR (RAdio Detection And Ranging) with air/space and radio waves. Both work on the principle of transmitting a wave and detecting its reflection.

---

23. If 5A current flows through an electric iron, it produces 50J heat in one second, the potential across the electric iron will be
(A) 10V
(B) 0.1V
(C) 225V
(D) 2.25V
Correct Answer: (A) 10V

Solution:
We are given the following information:

Current (I) = 5 A

Heat produced (H) = 50 J

Time (t) = 1 second

We need to find the potential difference (V).

The relationship between heat produced, potential difference, current, and time is given by Joule's law of heating:

$H = V \times I \times t$.

We can rearrange this formula to solve for V:

$V = \frac{H}{I \times t}$.

Now, substitute the given values into the formula:

$V = \frac{50}{5 \times 1}$.

$V = \frac{50}{5}$.

$V = 10$ Volts.

Quick Tip

Remember the different forms of the power/heat formula: $H = VIt$, $H = I^2Rt$, and $H = \frac{V^2}{R}t$. Choose the formula that directly uses the quantities given in the problem to avoid unnecessary intermediate calculations.

---

24. Coal fired power plants emit
(A) Magnesium (Mg)
(B) Aluminium (Al)
(C) Mercury (Hg)
(D) Silicon (Si)
Correct Answer: (C) Mercury (Hg)

Solution:
Coal is a natural fossil fuel that contains trace amounts of various elements, including heavy metals.

When coal is burned in power plants to generate electricity, these trace elements are released into the atmosphere along with other pollutants like sulfur dioxide, nitrogen oxides, and particulate matter.

Among the options provided, Mercury (Hg) is a significant and highly toxic heavy metal pollutant known to be emitted from coal-fired power plants.

This airborne mercury can deposit in soil and water bodies, entering the food chain and posing serious health risks to humans and wildlife.

Magnesium, Aluminium, and Silicon are common elements in the Earth's crust and are major components of fly ash (the solid residue from coal combustion), but Mercury is the most notable

toxic metal emission from this list.

Quick Tip

When thinking about pollution from coal plants, the main pollutants to remember are greenhouse gases (CO_2), acid rain precursors (SO_2, NO_x), particulate matter (soot/ash), and toxic heavy metals like Mercury (Hg).

---

25. Blue planet is _____.
(A) Earth
(B) Mars
(C) Venus or Saturn
(D) Jupiter
Correct Answer: (A) Earth

Solution:
The planet Earth is often referred to as the Blue Planet.

This is because approximately 71% of the Earth's surface is covered by oceans, seas, lakes, and rivers.

When viewed from space, the vast expanse of water reflects blue light, giving the planet a predominantly blue appearance.

Mars is known as the Red Planet due to the iron oxide (rust) on its surface.

Therefore, the correct answer is Earth.

Quick Tip

Associate planets with their common nicknames: Earth is the Blue Planet, Mars is the Red Planet. This is a common general knowledge question.

---

26. If temperature of warm water is 40° Celsius and that of warm milk is 95° Fahrenheit, which one of the following sentences is true?
(A) Milk has little greater temperature than water and warm.
(B) Both have same temperature.
(C) Milk has lesser temperature than water.
(D) Milk has higher temperature than water and hot.
Correct Answer: (C) Milk has lesser temperature than water.

Solution:
To compare the two temperatures, we must convert them to the same unit. Let's convert the water's temperature from Celsius to Fahrenheit.

The formula for converting Celsius (C) to Fahrenheit (F) is: $F = \left(C \times \frac{9}{5}\right) + 32$.

Given the water's temperature is $C = 40°$.

Substitute this value into the formula:

$F = \left(40 \times \frac{9}{5}\right) + 32.$

$F = (8 \times 9) + 32.$

$F = 72 + 32.$

$F = 104°\text{F}.$

So, the temperature of the water is 104°F.

The temperature of the milk is given as 95°F.

Now we compare the temperatures:

Water temperature = 104°F.

Milk temperature = 95°F.

Since $95°F < 104°F$, the milk has a lesser temperature than the water.

Quick Tip

Memorize the Celsius to Fahrenheit conversion formula: $F = (C \times 1.8) + 32$. For quick mental estimates, remember that 0°C is 32°F, 10°C is 50°F, and 100°C is 212°F.

---

27. 1 Newton = _____ dyne
(A) 10^3
(B) 10^4
(C) 10^5
(D) 10^6
Correct Answer: (C) 10^5

Solution:
The Newton (N) is the SI unit of force, and the dyne (dyn) is the CGS (Centimetre-Gram-Second) unit of force.

By definition, Force = mass × acceleration.

1 Newton = 1 kilogram × 1 meter/second^2.

1 N = 1 kg × 1 m/s^2.

We need to convert kilograms to grams and meters to centimeters.

1 kg = 1000 grams = 10^3 g.

1 meter = 100 centimeters = 10^2 cm.

Substitute these conversions back into the equation for Newton:

1 N = (10^3 g) × (10^2 cm)/s^2.

1 N = $10^3 \times 10^2$ g·cm/s^2.

1 N = 10^5 g·cm/s^2.

By definition, 1 dyne = 1 g·cm/s^2.

Therefore, 1 Newton = 10^5 dyne.

Quick Tip

Remember the relationship between SI and CGS units for common physical quantities. For force, 1 N = 10^5 dynes. For work/energy, 1 Joule = 10^7 ergs.

---

28. The temperature of water at the bottom of a large water fall is higher than that of the water at the top, because
(A) The falling water absorbs heat from the sun.
(B) The water at the bottom has greater potential energy.
(C) The kinetic energy of the falling water is converted into heat.
(D) Rocks on the bed of the river give out heat.
Correct Answer: (C) The kinetic energy of the falling water is converted into heat.

Solution:
This phenomenon is explained by the principle of conservation of energy.

At the top of the waterfall, water possesses gravitational potential energy ($PE = mgh$).

As the water falls, its potential energy is converted into kinetic energy ($KE = \frac{1}{2}mv^2$).

When the water hits the rocks and the pool at the bottom, its macroscopic motion (and thus its kinetic energy) is brought to a stop.

This kinetic energy does not disappear; it is converted into other forms, primarily into thermal energy (heat) due to the impact, friction, and turbulence.

This conversion of kinetic energy into heat slightly increases the temperature of the water at the bottom of the waterfall.

Option (C) correctly describes this energy transformation. Options (A), (B), and (D) are incorrect physical explanations.

Quick Tip

This is a classic example of the mechanical equivalent of heat. The potential energy at the top is converted to kinetic energy during the fall, which is then converted to thermal energy upon impact at the bottom.

---

29. Which of the following elements is highly reactive?
(A) K (Potassium)
(B) Ag (Argentum)
(C) Au (Aurum)
(D) Al (Aluminium)
Correct Answer: (A) K (Potassium)

Solution:
The reactivity of metals is determined by their position in the reactivity series (or activity series). Metals at the top are most reactive, and those at the bottom are least reactive.

Let's analyze the given options based on the reactivity series:

K (Potassium): It is an alkali metal, located at the very top of the reactivity series. It is extremely reactive and reacts violently with water.

Al (Aluminium): It is a fairly reactive metal, but it typically forms a thin, tough, protective layer of aluminum oxide on its surface that prevents further reaction. It is less reactive than Potassium.

Ag (Argentum/Silver) and Au (Aurum/Gold): These are noble metals, found near the bottom of the reactivity series. They are very unreactive and do not easily corrode or react with acids.

Comparing the four elements, Potassium (K) is by far the most reactive.

Quick Tip

Remember the general trend of the reactivity series: Alkali metals (K, Na) ¿ Alkaline earth metals (Ca, Mg) ¿ Other metals (Al, Zn, Fe) ¿ Hydrogen ¿ Less reactive metals (Cu, Ag, Au).

---

30. Choose the correct statements of the following.
(i) Bases would be soapy when touched.
(ii) Malic acid is present in apples.
(iii) Stearic acid is present in fats.
(iv) Tooth paste is acidic in nature.
(A) (i) & (ii)
(B) (i), (ii) & (iii)
(C) (ii), (iii) & (iv)
(D) (iv) only
Correct Answer: (B) (i), (ii) & (iii)

Solution:
Let's evaluate each statement to determine its correctness.

(i) Bases would be soapy when touched.
This is a characteristic physical property of alkaline solutions (bases dissolved in water). They feel slippery or soapy to the touch. This statement is correct.

(ii) Malic acid is present in apples.
This is a well-known fact. Malic acid is the primary organic acid found in apples and contributes to their tart flavor. This statement is correct.

(iii) Stearic acid is present in fats.
Stearic acid is a common saturated fatty acid found in many animal and vegetable fats and oils. This statement is correct.

(iv) Tooth paste is acidic in nature.
This is incorrect. Bacteria in the mouth produce acids that can damage tooth enamel. Toothpaste is formulated to be basic (alkaline) to neutralize these acids and help protect the teeth.

Since statements (i), (ii), and (iii) are correct and statement (iv) is incorrect, the correct option includes only (i), (ii), and (iii).

Quick Tip

Remember the basic properties of acids and bases. Acids are sour, react with metals. Bases are bitter, feel soapy. Toothpaste is a common example of a practical application of a base to neutralize acids.

---

3 Biological Science

31. Which of the following is NOT a fat soluble?
(A) Vitamin - A
(B) Vitamin - C
(C) Vitamin - D
(D) Vitamin - E
Correct Answer: (B) Vitamin - C

Solution:
Vitamins are broadly classified into two categories based on their solubility: fat-soluble and water-soluble.

The fat-soluble vitamins are Vitamin A, Vitamin D, Vitamin E, and Vitamin K. These vitamins are absorbed along with fats in the diet and can be stored in the body's fatty tissue and liver.

The water-soluble vitamins include Vitamin C and the B-complex vitamins. These vitamins dissolve in water and are not stored in the body in large amounts; excess amounts are usually excreted in the urine.

The question asks which of the given options is NOT fat-soluble.

Based on the classification, Vitamin C is a water-soluble vitamin.

Therefore, Vitamin C is not a fat-soluble vitamin.

Quick Tip

A simple mnemonic to remember the fat-soluble vitamins is ADEK. Any vitamin not in this group (like C and B-complex) is water-soluble.

32. What is the characteristic feature of Eutrophic Lake?
(A) Low level of nutrients
(B) Little organic matter
(C) Low productivity
(D) Very rich in nutrients
Correct Answer: (D) Very rich in nutrients

Solution:
The term eutrophic comes from the Greek words 'eu' (meaning well) and 'trophe' (meaning nourishment).

A eutrophic lake is a body of water that has a high level of biological productivity due to an excessive concentration of nutrients, particularly nitrogen and phosphorus.

This enrichment with nutrients is called eutrophication.

The high nutrient levels lead to an overgrowth of plants and algae (algal blooms). When these organisms die, their decomposition by bacteria consumes a large amount of dissolved oxygen, which can harm other aquatic life.

Therefore, the primary characteristic feature of a eutrophic lake is that it is very rich in nutrients.

Quick Tip

Remember the classification of lakes by nutrient content: Oligotrophic (low nutrients, clear water, high oxygen), Mesotrophic (medium nutrients), and Eutrophic (high nutrients, murky water, often low oxygen in deep areas).

---

33. The contraction and expansion movement of the wall of food pipe is known as:
(A) Peristaltic movement
(B) Reverse peristaltic movement
(C) Digestion
(D) Nutrition
Correct Answer: (A) Peristaltic movement

Solution:
The food pipe, or esophagus, is a muscular tube that connects the pharynx (throat) with the stomach.

To move food down the esophagus after swallowing, the walls of the food pipe undergo a series of involuntary, wave-like muscle contractions.

This process involves the contraction of circular muscles behind the food bolus and the relaxation of muscles in front of it, effectively pushing the food along the digestive tract.

This specific wave-like movement of contraction and expansion is called peristalsis or peristaltic movement.

Digestion is the chemical breakdown of food, and nutrition is the process of obtaining food for health and growth. Reverse peristalsis is the process that leads to vomiting.

Quick Tip

Peristalsis occurs throughout the digestive tract, not just the food pipe. It's the primary mechanism that propels food through the stomach, small intestine, and large intestine.

---

34. Which of the following cell organelle does not contain DNA?
(A) Mitochondria
(B) Nucleus
(C) Chloroplast
(D) Lysosome
Correct Answer: (D) Lysosome

Solution:
Let's analyze the options to see which organelles contain DNA.

Nucleus: The nucleus is the primary location of the cell's genetic material (DNA) in eukaryotes. It contains the vast majority of the cell's genes.

Mitochondria: These organelles are responsible for cellular respiration and have their own small, circular DNA, known as mitochondrial DNA (mtDNA). This supports the endosymbiotic theory.

Chloroplast: Found in plant cells and some protists, chloroplasts carry out photosynthesis. They also contain their own circular DNA (cpDNA), similar to mitochondria.

Lysosome: Lysosomes are membrane-bound organelles that contain digestive enzymes. Their primary function is to break down waste materials, foreign invaders, and cellular debris. They do not contain their own DNA.

Therefore, the lysosome is the cell organelle among the choices that does not contain DNA.

Quick Tip

In eukaryotic cells, DNA is found primarily in the nucleus. However, remember that two key organelles, mitochondria and chloroplasts, have their own DNA, which is a remnant of their prokaryotic origins (endosymbiotic theory).

---

35. Which of the following pairs of organs is an example of analogous organs?
(A) Forelimbs of a human & bird.
(B) Wings of Butterfly and Bird.
(C) Heart of human & fish.
(D) Leaves & tendrils of pea plant.
Correct Answer: (B) Wings of Butterfly and Bird.

Solution:
Analogous organs are structures that have a similar function but different evolutionary origins and anatomical structures.

Homologous organs, in contrast, have a common evolutionary origin and similar underlying structure but may have different functions.

Let's examine the options:

(A) Forelimbs of a human & bird: These are homologous. Both have the same basic bone structure (humerus, radius, ulna, etc.) inherited from a common ancestor, but they are adapted for different functions (grasping vs. flying).

(B) Wings of Butterfly and Bird: These are analogous. Both are used for flying (similar function), but their structures are very different. A bird's wing is an internal skeleton of bones, while a butterfly's wing is a thin membrane of chitin. They do not share a common evolutionary origin for flight.

(C) Heart of human & fish: These are homologous, evolving from a common ancestral heart structure, but they differ significantly in structure (4 chambers vs. 2 chambers).

(D) Leaves & tendrils of pea plant: The tendrils of a pea plant are modified leaves. Since they both originate from the same basic structure (leaf), they are considered homologous.

Therefore, the wings of a butterfly and a bird are the correct example of analogous organs.

Quick Tip

To distinguish between homologous and analogous structures, ask two questions: 1. Do they have the same function? 2. Do they have the same basic structure and origin? If Yes to 1 but No to 2, they are analogous. If No to 1 but Yes to 2, they are homologous.

---

36. What is the main cause of acid rain?
(A) Emission of carbon dioxide from vehicles
(B) Release of chlorofluorocarbons (CFCs) from refrigerators
(C) Combustion of fossil fuels, releasing sulphur dioxide, nitrogen oxides
(D) Deforestation and land use changes
Correct Answer: (C) Combustion of fossil fuels, releasing sulphur dioxide, nitrogen oxides

Solution:
Acid rain is primarily caused by the emission of certain pollutants into the atmosphere, which then react with water, oxygen, and other chemicals to form acidic compounds.

The main pollutants responsible for acid rain are sulfur dioxide (SO_2) and nitrogen oxides (NO_x).

These gases are released into the atmosphere mainly from the combustion of fossil fuels (like coal, oil, and natural gas) in power plants, factories, and vehicles.

In the atmosphere, sulfur dioxide reacts with water to form sulfuric acid (H_2SO_4), and nitrogen oxides react to form nitric acid (HNO_3).

These acids then fall to the Earth as acid rain, snow, fog, or dry particles.

Option (C) correctly identifies this as the main cause.

Quick Tip

Remember the key chemical culprits for major environmental issues: Acid Rain (SO_2, NO_x), Ozone Depletion (CFCs), and Global Warming (Greenhouse gases like CO_2, methane).

---

37. Red Data Book contains data of _____
1. Rare species
2. Endangered species
3. Fossils
4. Vulnerable species

(A) 2, 3 & 4 are correct
(B) 1 & 3 are correct
(C) 3 & 4 are correct
(D) 1, 2 & 4 are correct
Correct Answer: (D) 1, 2 & 4 are correct

Solution:
The Red Data Book is a public document created by the International Union for Conservation of Nature (IUCN).

Its purpose is to record and provide a comprehensive inventory of the global conservation status of biological species that are at risk of extinction.

It uses a set of criteria to evaluate the extinction risk of thousands of species. The categories include:

- Extinct (EX), Extinct in the Wild (EW)
- Critically Endangered (CR), Endangered (EN), Vulnerable (VU) - these are collectively known as 'threatened' species.
- Near Threatened (NT), Least Concern (LC)

The terms 'Rare species', 'Endangered species', and 'Vulnerable species' all refer to living organisms whose populations are in decline or at risk. These are the types of species documented in the Red Data Book.

'Fossils' (statement 3) are the preserved remains of organisms that lived in the geological past. They are studied in paleontology and are not relevant to the conservation status of currently living species.

Therefore, statements 1, 2, and 4 are correct.

Quick Tip

The IUCN Red List (or Red Data Book) is all about the conservation status of living or recently extinct species. Fossils belong to the realm of paleontology, not modern conservation biology.

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38. Arrange the following living organisms in food chain in CORRECT order. Frog, Grass, Snake, Grasshopper, Eagle
(A) Grass -¿ Frog -¿ Snake -¿ Grasshopper -¿ Eagle
(B) Grass -¿ Frog -¿ Grasshopper -¿ Snake -¿ Eagle
(C) Grass -¿ Grasshopper -¿ Frog -¿ Snake -¿ Eagle
(D) Grass -¿ Grasshopper -¿ Frog -¿ Eagle -¿ Snake

Correct Answer: (C) Grass -¿ Grasshopper -¿ Frog -¿ Snake -¿ Eagle

Solution:
A food chain shows the flow of energy in an ecosystem. It always starts with a producer and is followed by consumers.

1. Producer: The producer is an organism that makes its own food, usually through photosynthesis. In this list, Grass is the producer.

2. Primary Consumer (Herbivore): This organism eats the producer. The Grasshopper eats grass.

3. Secondary Consumer (Carnivore/Omnivore): This organism eats the primary consumer. The Frog eats the grasshopper.

4. Tertiary Consumer: This organism eats the secondary consumer. The Snake eats the frog.

5. Quaternary Consumer (Apex Predator): This organism is at the top of this food chain and eats the tertiary consumer. The Eagle eats the snake.

Following this flow of energy, the correct order is: Grass -¿ Grasshopper -¿ Frog -¿ Snake -¿ Eagle.

Quick Tip

To construct a food chain, always start by identifying the producer (usually a plant). Then, for each subsequent organism, ask What does it eat? from the remaining list to establish the correct sequence.

---

39. The number of sex chromosomes in every human cell
(A) 22 pairs
(B) 23 pairs
(C) 1 pair
(D) 2 pairs
Correct Answer: (C) 1 pair

Solution:
A typical human somatic (non-reproductive) cell contains a total of 46 chromosomes, which are arranged in 23 pairs.

These 23 pairs are divided into two types:

1. Autosomes: There are 22 pairs of autosomes. These chromosomes carry the genetic information for the general traits of the body.

2. Sex Chromosomes: There is 1 pair of sex chromosomes. These chromosomes determine the biological sex of the individual.

In females, the pair consists of two X chromosomes (XX).

In males, the pair consists of one X chromosome and one Y chromosome (XY).

Therefore, in every human cell, there is 1 pair of sex chromosomes.

Quick Tip

Remember the total chromosome count for humans: 23 pairs = 46 total. This is broken down into 22 pairs of autosomes + 1 pair of sex chromosomes.

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40. One of the following is NOT a better option to save the environment from plastics.
(A) Recycle
(B) Reduce
(C) Reuse
(D) Recover
Correct Answer: (D) Recover

Solution:
The widely recognized hierarchy for waste management, often called the 3 Rs, prioritizes environmental protection. The order of preference is:

1. Reduce: The best option is to reduce the amount of plastic consumed in the first place. This prevents waste generation at the source.

2. Reuse: The next best option is to reuse plastic items multiple times for their original or a new purpose. This extends the life of the material.

3. Recycle: If plastic cannot be reduced or reused, it should be recycled. This involves processing the waste plastic to create new products.

These three options (Reduce, Reuse, Recycle) are considered the most effective and environmentally friendly strategies.

Recover: This term often refers to recovering energy from waste, for example, by incinerating plastics to generate heat or electricity. While this can be better than sending plastic to a landfill, it is generally considered a less desirable option than the 3 Rs because it destroys the material, can release pollutants, and contributes to greenhouse gas emissions.

Therefore, Recover is NOT a better option compared to Reduce, Reuse, and Recycle.

Quick Tip

The waste hierarchy is a key concept in environmental management. The most preferred options are at the top (prevention/reduction), and the least preferred are at the bottom (disposal/landfill). The 3 Rs (Reduce, Reuse, Recycle) are at the top of the management strategies.

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4 Geography

41. Which of the following are the second order land forms?
(A) Mountains, Oceans and Plains
(B) Plains, Plateaus and Continents
(C) Mountains, Plains and Plateaus
(D) Plateaus, Rivers and Plains
Correct Answer: (C) Mountains, Plains and Plateaus

Solution:
Geographers classify landforms into different orders based on their scale and origin.

First-order landforms are the largest and are on a global scale. They consist of the continental landmasses and the ocean basins.

Second-order landforms are the major features found on the continents and in the oceans. On the continents, these include mountains, plains, and plateaus.

Third-order landforms are smaller, more localized features created by erosion and deposition, such as rivers, valleys, beaches, and deltas.

The question asks for second-order landforms. Based on the classification, mountains, plains, and plateaus fit this category.

Therefore, option (C) is the correct answer.

Quick Tip

Remember the hierarchy of landforms: 1st Order (Continents/Oceans) ¿ 2nd Order (Mountains/Plains/Plateaus) ¿ 3rd Order (Valleys/Rivers/Deltas).

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42. Match the following

(1)	Rakhi hills రాఖీ కొండలు	(a)	Vikarabad వికారాబాద
(2)	Anantagiri hills అనంతగిరి కొండలు	(b)	Jagitial జగిత్యాల్
(3)	Kandikal hills కందికల్ కొండలు	(c)	Peddapally పెద్దపల్లి
(4)	Balaghat Range బాలాఘాట్ శ్రేణులు	(d)	Mahabubnagar మహబూబ్ నగర్

(A) (1)-(a); (2)-(c); (3)-(d); 4-(b)
(B) (1)-(a); (2)-(d); (3)-(b); 4-(c)
(C) (1)-(b); (2)-(a); (3)-(c); 4-(d)
(D) (1)-(b); (2)-(c); (3)-(b); 4-(a)
Correct Answer: (C) (1)-(b); (2)-(a); (3)-(c); 4-(d)

Solution:
This question requires knowledge of the geography of Telangana. We need to match the hills and ranges to their correct locations.

(1) Rakhi hills are located in the Jagitial district. So, (1) matches with (b).

(2) Anantagiri hills are a major tourist destination located in the Vikarabad district. So, (2) matches with (a).

(3) Kandikal hills (or Kandikal Gutta) are situated in the Peddapally district. So, (3) matches with (c).

(4) The Balaghat Range is a low-lying mountain range that passes through parts of the old Mahabubnagar district (now spanning several new districts). So, (4) matches with (d).

The correct matching is: (1)-(b), (2)-(a), (3)-(c), (4)-(d).

This corresponds to option (C).

Quick Tip

For state-specific geography questions, it is helpful to create a mental map or a quick chart of major physical features (hills, rivers, plateaus) and their corresponding districts.

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43. Tamil Nadu state receives low amount of rainfall by south west monsoon because

(A) due to location in rain shadow area.
(B) located in coastal area.
(C) located near to rayalaseema region.
(D) located away from coastal area.

Correct Answer: (A) due to location in rain shadow area.

Solution:

The South-West Monsoon brings heavy rainfall to much of India from June to September.

The Arabian Sea branch of this monsoon hits the Western Ghats mountain range along the west coast of India.

As the moisture-laden winds rise over the mountains, they cool, condense, and cause heavy rainfall on the windward (western) side.

Tamil Nadu is located on the leeward (eastern) side of the Western Ghats.

By the time the winds cross the mountains and descend on the eastern side, they have lost most of their moisture. This dry region on the leeward side is known as a rain shadow area.

Therefore, Tamil Nadu receives very little rainfall from the South-West Monsoon because it lies in the rain shadow region of the Western Ghats. It gets most of its rainfall from the retreating North-East Monsoon later in the year.

Quick Tip

Understand the orographic rainfall effect: Windward side of a mountain gets heavy rain, while the leeward side is a dry rain shadow area. This explains many rainfall patterns in India, particularly related to the Western Ghats.

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44. Match List-I with List-II and select correct answer using code given

List-I జాబితా-I	List-II జాబితా-II
a. Konkan Coast కొంకన్ తీరం	1. Karnataka కర్ణాటక
b. Canara Coast కెనరా తీరం	2. Kerala కేరళ
c. Malabar Coast మలబార్ తీరం	3. Tamil Nadu తమిళ నాడు
d. Coromandel Coast కోరమండల్ తీరం	4. Maharashtra & Goa మహారాష్ట్ర & గోవా

(A) a-1, b-2, c-3, d-4
(B) a-4, b-3, c-1, d-2
(C) a-1, b-4, c-3, d-2
(D) a-4, b-1, c-2, d-3
Correct Answer: (D) a-4, b-1, c-2, d-3

Solution:
Let's match the coastal plains (List-I) with their corresponding states (List-II).

a. Konkan Coast: This is the northern part of the western coast of India, stretching along the states of Maharashtra and Goa. So, a matches with 4.

b. Canara Coast: This is the central part of the western coast, primarily located in the state of Karnataka. So, b matches with 1.

c. Malabar Coast: This is the southern part of the western coast, extending along the state of Kerala. So, c matches with 2.

d. Coromandel Coast: This is the coastal plain on the eastern side of India, stretching along the state of Tamil Nadu. So, d matches with 3.

The correct matching is a-4, b-1, c-2, d-3.

This corresponds to option (D).

Quick Tip

To remember the western coastal plains from north to south, use the mnemonic Go Kanara, Ma! (Goa/Maharashtra - Konkan, Karnataka - Canara, Malabar - Kerala). The Coromandel coast is the major eastern coast.

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45. The 'steppes' in Eurasia are
(A) Tropical grass lands
(B) Temperate grass lands

(C) Tropical deciduous forests
(D) Temperate evergreen forests
Correct Answer: (B) Temperate grass lands

Solution:
The term 'Steppe' refers to a specific type of biome.

Steppes are large areas of flat, unforested grassland found in temperate regions with semi-arid climates.

They are characterized by grasses of short to medium height and are found in regions with cold winters and warm to hot summers.

The great Eurasian Steppe is a vast expanse of grassland that stretches from Eastern Europe through Central Asia.

Tropical grasslands are known as 'Savannas' and have scattered trees. Steppes are typically treeless.

Therefore, the 'steppes' in Eurasia are temperate grass lands.

Quick Tip

Associate different names with grassland biomes: Steppes (Eurasia), Prairies (North America), Pampas (South America), Veld (South Africa), and Savanna (Tropical regions, especially Africa).

---

5 History

46. This metal that was not used by the people of the Indus Valley Civilization is
(A) Copper
(B) Silver
(C) Tin
(D) Iron
Correct Answer: (D) Iron

Solution:
The Indus Valley Civilization, also known as the Harappan Civilization, belongs to the Bronze Age.

This civilization flourished approximately from 3300 BCE to 1300 BCE.

The people of this era were skilled metallurgists and used several metals:

- They widely used Copper.
- They mixed Copper with Tin to produce Bronze, which was used for tools, weapons, and sculptures.
- They also used precious metals like Silver and Gold for ornaments.

The use of Iron began much later in the Indian subcontinent, during what is known as the Iron Age, around 1000 BCE.

Therefore, Iron was the metal that was not used by the people of the Indus Valley Civilization.

Quick Tip

Remember that the Indus Valley Civilization was a Bronze Age culture. This immediately tells you they used bronze (and its components, copper and tin) but had not yet entered the Iron Age.

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47. The chronological order of the following is
1 Formation of USSR.
2 Japan's attack on Perl Harbor.
3 Nazi party came to power in Germany
4 Germany's attack on USSR
(A) 1, 2, 3, 4
(B) 1, 3, 2, 4
(C) 2, 1, 4, 3
(D) 3, 1, 4, 2
Correct Answer: (B) 1, 3, 2, 4

Solution:
To determine the chronological order, we must identify the year of each event.

1. Formation of USSR: The treaty creating the Union of Soviet Socialist Republics was signed in December 1922.

3. Nazi party came to power in Germany: Adolf Hitler was appointed Chancellor of Germany in January 1933.

4. Germany's attack on USSR: Operation Barbarossa, the German invasion of the Soviet Union, began in June 1941.

2. Japan's attack on Pearl Harbor: The attack that brought the USA into World War II occurred in December 1941.

The correct historical sequence of these events is 1 (1922), 3 (1933), 4 (June 1941), 2 (December 1941).

The provided answer key states the correct option is (B), which lists the order as 1, 3, 2, 4. This order is historically incorrect as event 4 occurred before event 2. There appears to be an error in the question's answer key. However, adhering strictly to the provided key, we select option (B).

Quick Tip

For chronological questions, focus on key dates of major historical periods like WWI, the interwar period, and WWII. Be aware that exam answer keys can sometimes contain errors, but you must follow the instructions given.

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48. Arrange the following events in chronological order:
1. Mahatma Gandhi's return to India.
2. Passing of Rowlatt Act.
3. Ahmedabad Mill Worker's movement.
4. Launch of Champaran Satyagraha.
(A) 1, 2, 3, 4
(B) 1, 4, 3, 2
(C) 4, 3, 2, 1
(D) 3, 2, 4, 1
Correct Answer: (B) 1, 4, 3, 2

Solution:
To arrange the events in chronological order, let's find the year each event took place.

1. Mahatma Gandhi's return to India: Mahatma Gandhi returned to India from South Africa on January 9, 1915.

4. Launch of Champaran Satyagraha: This was Gandhi's first Satyagraha movement in India, which took place in 1917.

3. Ahmedabad Mill Worker's movement: Gandhi led this movement in Ahmedabad in February-March 1918.

2. Passing of Rowlatt Act: This controversial act was passed by the Imperial Legislative Council in March 1919.

The correct chronological order is 1915 -¿ 1917 -¿ 1918 -¿ 1919.

This corresponds to the sequence of events: 1, 4, 3, 2.

Quick Tip

Remember the order of Gandhi's early movements in India: he came in 1915, then C.A.K.E - Champaran (1917), Ahmedabad (1918), Kheda (1918). The Rowlatt Act and the subsequent Jallianwala Bagh massacre occurred in 1919.

---

49. Establishment year of League of Nations
(A) 1921
(B) 1918
(C) 1920
(D) 1919
Correct Answer: (C) 1920

Solution:
The League of Nations was an international organization founded as a result of the Paris Peace Conference that ended the First World War.

The primary goal of the organization was to maintain world peace and prevent future wars through collective security and disarmament.

The Covenant of the League of Nations was incorporated into the Treaty of Versailles in 1919.

The League of Nations was officially established and came into being when the Covenant took effect on January 10, 1920.

Therefore, the establishment year of the League of Nations is 1920.

Quick Tip

Don't confuse the end of WWI (1918) or the Treaty of Versailles (1919) with the actual establishment of the League of Nations (1920). The United Nations (UN) was formed after WWII in 1945, replacing the League.

---

50. The writer of Gatha Saptashathi
(A) Rudra Varma
(B) Simuka

(C) Hala
(D) Balasri
Correct Answer: (C) Hala

Solution:
The Gatha Saptashati (or Gaha Sattasai in Prakrit) is a famous ancient Indian collection of poems.

It is an anthology of seven hundred verses written in the Maharashtri Prakrit language.

The poems primarily deal with themes of love and the lives of common people.

The compilation of this work is traditionally attributed to a Satavahana dynasty king named Hala (or Hāla).

Simuka was the founder of the Satavahana dynasty, but Hala is credited with this literary work.

Therefore, the writer of Gatha Saptashathi was Hala.

Quick Tip

Associate key rulers with their major contributions. For the Satavahanas, remember Simuka as the founder and Hala as the poet-king credited with the Gatha Saptashati.

---

6 Political Science

51. The Article 356 of the Indian constitution deals with
(A) Financial Emergency
(B) President Rule
(C) Grants-in-aids
(D) Finance Commission
Correct Answer: (B) President Rule

Solution:
Article 356 of the Constitution of India is one of the emergency provisions.

It empowers the President of India to impose President's Rule in a state if the President is satisfied that a situation has arisen in which the government of the state cannot be carried on in accordance with the provisions of the Constitution.

This is also known as a 'State Emergency' or 'Constitutional Emergency'.

Financial Emergency is dealt with under Article 360.

The Finance Commission is constituted under Article 280.

Therefore, Article 356 deals with President's Rule.

Quick Tip

Remember the three types of emergencies in the Indian Constitution: National Emergency (Article 352), State Emergency/President's Rule (Article 356), and Financial Emergency (Article 360).

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52. Arrange the following in chronological order.
1) Economic liberalisation.
2) Implementation of Mandal Commission recommendations.
3) End of Emergency.
4) Launch of operation Barga.
(A) 2, 1, 4, 3
(B) 3, 4, 2, 1
(C) 4, 2, 1, 3
(D) 3, 1, 2, 4
Correct Answer: (B) 3, 4, 2, 1

Solution:
To arrange the events chronologically, we need to know the year in which each occurred.

3) End of Emergency: The national emergency declared in 1975 by the Indira Gandhi government was officially lifted in March 1977.

4) Launch of Operation Barga: This was a major land reform movement in West Bengal, initiated by the Left Front government in 1978.

2) Implementation of Mandal Commission recommendations: The V. P. Singh government announced the implementation of the Mandal Commission's recommendations for reservations for OBCs in August 1990.

1) Economic liberalisation: The new economic policy of liberalisation, privatisation, and globalisation was introduced in India in 1991.

The correct chronological sequence is 1977 -¿ 1978 -¿ 1990 -¿ 1991.

This corresponds to the order of events: 3, 4, 2, 1.

Quick Tip

Associate major political and economic events with the prime ministers of the time: Emergency (Indira Gandhi), Mandal Commission (V.P. Singh), Economic Liberalisation (P.V. Narasimha Rao).

---

53. The year in which the Criminal Legal Amendment Act (Nirbhaya Act) was implemented by the Central Government is
(A) 2013
(B) 2014
(C) 2012
(D) 2015
Correct Answer: (A) 2013

Solution:
The Criminal Law (Amendment) Act, 2013, is popularly known as the Nirbhaya Act.

This act was passed by the Parliament of India in response to the massive public outrage following the 2012 Delhi gang rape and murder case.

The Act amended several sections of the Indian Penal Code, Code of Criminal Procedure, and the Indian Evidence Act to introduce stricter laws and punishments for crimes against women.

It came into force on 3rd February 2013.

Therefore, the year of implementation was 2013.

Quick Tip

Remember key legislation and the landmark events that triggered them. The Nirbhaya Act (2013) is directly linked to the tragic Delhi gang rape case of December 2012.

---

54. The government shall give free and compulsory education to the children between 6 years to 14 years. This is a part of the following right
(A) Right to Education and Culture.
(B) Right to Life.
(C) Right against Exploitation.
(D) Right to Equality.

Correct Answer: (B) Right to Life.

Solution:
The right to free and compulsory education for children between 6 and 14 years was made a Fundamental Right by the 86th Constitutional Amendment Act, 2002.

This amendment inserted a new article, Article 21-A, into the Constitution.

Prior to this, the Supreme Court of India in the Unni Krishnan case (1993) had held that the Right to Education is a fundamental right that flows from the Right to Life under Article 21.

The court interpreted Article 21 (Right to Life and Personal Liberty) to be broad and to include the right to live with human dignity, which in turn includes the right to education.

Although now an explicit right under Article 21-A, it is fundamentally derived from and considered an integral part of the Right to Life (Article 21). Among the given options, 'Right to Life' is the most appropriate foundational right.

Quick Tip

Understand the evolution of fundamental rights. The Supreme Court has often expanded the scope of Article 21 (Right to Life) through interpretation to include many other rights like the right to education, a clean environment, and privacy.

---

55. The part of the Telangana Legislative Council members being elected by the teachers is
(A) $\frac{1}{12}$ th
(B) $\frac{1}{6}$ th
(C) $\frac{1}{3}$ rd
(D) $\frac{1}{4}$ th
Correct Answer: (A) $\frac{1}{12}$ th

Solution:
The composition of the Legislative Council (Vidhan Parishad) in an Indian state is defined in Article 171 of the Constitution.

The election process involves several electorates:

- $\frac{1}{3}$ are elected by the Members of the Legislative Assembly (MLAs).
- $\frac{1}{3}$ are elected by members of local bodies like municipalities.
- $\frac{1}{12}$ are elected by graduates of three years' standing residing in the state.

- $\frac{1}{12}$ are elected by teachers of at least three years' standing in educational institutions not lower than secondary schools.
- The remaining $\frac{1}{6}$ are nominated by the Governor.

The question asks for the part elected by the teachers, which is one-twelfth ($\frac{1}{12}$).

Quick Tip

Remember the fractions for the composition of the Legislative Council: $\frac{1}{3}$ by MLAs, $\frac{1}{3}$ by local bodies, $\frac{1}{12}$ by graduates, $\frac{1}{12}$ by teachers, and $\frac{1}{6}$ nominated.

---

7 Economics

56. Dearness Allowance is paid to the government employees using
(A) National income
(B) Per capita income
(C) Wholesale price index
(D) Consumer price index
Correct Answer: (D) Consumer price index

Solution:
Dearness Allowance (DA) is a component of salary paid to government employees in India, Bangladesh, and Pakistan.

It is a cost of living adjustment allowance, meaning its purpose is to protect the real value of employees' salaries from the effects of inflation.

Inflation is the rate at which the general level of prices for goods and services is rising, and subsequently, purchasing power is falling.

The DA is calculated as a percentage of the basic salary, and this percentage is revised periodically based on the rate of inflation.

The inflation rate used for this calculation is measured by the Consumer Price Index (CPI), specifically the All India Consumer Price Index for Industrial Workers (AICPI-IW).

Therefore, DA is paid to employees using the Consumer Price Index as the basis.

Quick Tip

Associate Dearness Allowance (DA) directly with inflation faced by consumers. The best measure for consumer inflation is the Consumer Price Index (CPI), not the Wholesale Price Index (WPI) which tracks prices at the wholesale level.

---

57. This is an example of foreign multinational company
(A) Ranbaxy
(B) Asian Paints
(C) Sundaram Fasteners
(D) Cargill Foods
Correct Answer: (D) Cargill Foods

Solution:
Let's analyze the origin of each company listed.

(A) Ranbaxy Laboratories Limited was an Indian multinational pharmaceutical company that was founded in India in 1961. It was later acquired by a foreign company, but its origin is Indian.

(B) Asian Paints is an Indian multinational paint company, headquartered in Mumbai. It was founded in 1942.

(C) Sundaram Fasteners is an Indian company, part of the TVS Group, that manufactures automotive and industrial components. It was founded in Chennai in 1966.

(D) Cargill, Incorporated is an American privately held global food corporation based in Minnetonka, Minnesota. It was founded in 1865. As an American company operating globally, it is a foreign multinational company from an Indian perspective.

Therefore, Cargill Foods is the example of a foreign multinational company.

Quick Tip

For questions identifying company origins, be aware of major Indian brands (like Asian Paints, TVS Group companies) versus major global brands (like Cargill, Nestlé, Coca-Cola).

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58. Identify the correct statements related to the impact of Industrialisation.
I. It created employment opportunities in urban areas.
II. It led to significant environmental pollution.
III. It decreased the population of urban areas.

IV. It made rural agriculture obsolete.
(A) I and II
(B) II and III
(C) III and IV
(D) I and IV
Correct Answer: (A) I and II

Solution:
Let's analyze each statement regarding the impact of industrialisation.

I. It created employment opportunities in urban areas. This is correct. The growth of factories and industries in cities created a high demand for labor, leading to job creation in urban centers.

II. It led to significant environmental pollution. This is correct. Industrial processes, increased use of fossil fuels, and urban concentration led to widespread air, water, and soil pollution.

III. It decreased the population of urban areas. This is incorrect. Industrialisation caused a massive wave of migration from rural areas to cities in search of jobs, which dramatically increased the population of urban areas.

IV. It made rural agriculture obsolete. This is incorrect. While industrialisation shifted the economic focus and reduced agriculture's share of the total economy, agriculture itself did not become obsolete. It remained (and still is) essential for food production.

The only correct statements are I and II.

Quick Tip

Think of industrialisation as a process of concentration: concentration of jobs, people, and pollution in urban areas. This makes it easy to identify its primary impacts.

---

59. Identify the final good from the following.
(A) Idli made by a cook in a family.
(B) Wheat produced and sold by the farmer to the floor mill.
(C) Shirt buttons sold by a shopkeeper to a tailor.
(D) Paper sold by a factory to a book binder.
Correct Answer: (A) Idli made by a cook in a family.

Solution:
In economics, a final good is a commodity that is used by the consumer to satisfy current wants

or needs, as opposed to an intermediate good, which is used to produce other goods.

Let's analyze the options:

(B) Wheat sold to a floor mill: This is an intermediate good because the mill will process the wheat into flour, which will be used to produce other goods like bread or biscuits.

(C) Shirt buttons sold to a tailor: These are intermediate goods because the tailor will use them as inputs to produce a final good, which is the shirt.

(D) Paper sold to a book binder: This is an intermediate good because the book binder will use it as an input to produce a final good, which is a book.

(A) Idli made by a cook in a family: This idli is prepared for direct consumption by the family. It is not being used as an input for further commercial production. It represents the end of the production chain for that item. Therefore, it is considered a final good in this context.

Quick Tip

To identify a final good, ask the question: Is this good being consumed by the end user, or is it being used as an ingredient to make something else for sale? If it's for final consumption, it's a final good.

---

60. GST is a
(A) Direct tax levied on income.
(B) Single tax replacing multiple indirect taxes.
(C) Tax on wealth.
(D) State-level direct tax.
Correct Answer: (B) Single tax replacing multiple indirect taxes.

Solution:
GST stands for Goods and Services Tax.

It is an indirect tax, meaning it is levied on the supply of goods and services, and the final consumer bears the burden, not the person who pays it to the government (like a shopkeeper). This rules out options (A) and (D).

The primary purpose of the introduction of GST in India was to reform the country's indirect tax structure.

Before GST, there were many different indirect taxes levied by both the central and state governments, such as Central Excise Duty, Service Tax, VAT (Value Added Tax), Entry Tax, etc.

GST subsumed most of these taxes into a single, comprehensive tax structure.

Therefore, GST is a single tax that replaced multiple indirect taxes. This matches option (B).

Quick Tip

Remember the key features of GST: it is an indirect, destination-based, consumption tax that replaced most existing indirect taxes. Direct taxes, like Income Tax, are levied directly on an individual's or entity's income or wealth.

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8 Teaching Aptitude

61. The most important characteristic of an effective teacher is
(A) knowledge in the subject matter.
(B) knowledge of teaching methods.
(C) commitment to the learner.
(D) knowledge of evaluation.
Correct Answer: (C) commitment to the learner.

Solution:
While subject matter knowledge, teaching methods, and evaluation skills are all essential for a teacher, they are tools.

The most fundamental characteristic that makes a teacher truly effective is their commitment to the learner.

This commitment is the driving force that motivates the teacher to use their knowledge and skills in the best possible way to ensure student success.

A committed teacher constantly strives to understand students' needs, adapt their methods, and create a supportive learning environment. The other characteristics are means to serve this primary commitment.

Therefore, commitment to the learner is the most important characteristic.

Quick Tip

In questions about teaching aptitude, the options that are student-centric (focusing on the learner's needs, well-being, and progress) are often the most appropriate answers.

62. During the course of teaching, the teacher should take the students from
(A) known to the known.
(B) known to the unknown.
(C) unknown to the known.
(D) unknown to the unknown.
Correct Answer: (B) known to the unknown.

Solution:
From known to unknown is a fundamental maxim of teaching.

This pedagogical principle suggests that learning is most effective when new information (the unknown) is built upon the foundation of what the student already understands (the known).

A teacher should first assess the students' prior knowledge and then connect the new concepts to their existing mental framework.

Starting from the unknown would be confusing, while staying at the known would result in no new learning.

Thus, the correct process is to guide students from the known to the unknown.

Quick Tip

This is a core principle of constructivist learning theory. Learners actively build new knowledge by relating it to their previous experiences and knowledge.

---

63. Complete silence in the classroom is an indication of
(A) poor management of class room.
(B) lack of motivation.
(C) lack of interest.
(D) fear of punishment.
Correct Answer: (A) poor management of class room.

Solution:
In modern pedagogy, a well-managed classroom is not necessarily a silent one.

A productive learning environment is often characterized by a learning buzz - students asking questions, engaging in discussions, and collaborating on tasks.

Complete silence, especially when it's not during a specific individual task like a test, can indicate a lack of engagement, interaction, and active learning.

This lack of a productive learning atmosphere can be seen as a sign of poor classroom management, where the teacher has failed to create activities that engage students.

While fear of punishment can also cause silence, poor management is a broader concept that includes creating a climate of fear or failing to stimulate participation. Therefore, it is the most encompassing answer.

Quick Tip

Distinguish between disciplined silence (e.g., during an exam) and passive silence. An effective classroom manager fosters an environment of active participation, not just quiet obedience.

---

64. Students learn better if they were
(A) taught in their mother tongue.
(B) punished for their errors.
(C) taught in foreign language.
(D) imposing strict discipline.
Correct Answer: (A) taught in their mother tongue.

Solution:
Educational research and policies, such as the National Education Policy (NEP), strongly support the use of the mother tongue as the medium of instruction, especially in the foundational years.

When students are taught in their mother tongue, they can focus their cognitive resources on understanding new concepts without the additional burden of translating a foreign language.

This leads to better comprehension, stronger foundational skills, and greater confidence.

Punishment is a negative reinforcement and is generally considered ineffective for long-term learning. Imposing strict discipline without understanding is less effective than fostering self-discipline. Learning in a foreign language can create barriers to understanding.

Therefore, being taught in their mother tongue is the most effective condition for learning among the given options.

Quick Tip

The principle of using the mother tongue as the medium of instruction, especially in early education, is a key recommendation in modern educational policies to improve learning outcomes and reduce dropout rates.

---

65. Which one of the following is considered as motivated teaching?
(A) Students taking notes.
(B) Maximum attendance of the students.
(C) Students maintain silence in the class.
(D) Students asking questions.
Correct Answer: (D) Students asking questions.

Solution:
Motivated teaching is teaching that inspires and engages students, leading to active learning.

The best indicator of student motivation and engagement among the choices is students asking questions.

Asking questions shows that students are actively processing the information, are curious to learn more, and are trying to connect new knowledge with what they already know.

Taking notes can be a passive activity. Maximum attendance might be due to compulsion. Silence can be a sign of fear or disinterest.

However, inquisitive students are a direct result of teaching that has successfully sparked their interest and motivation.

Quick Tip

Look for indicators of active student participation when evaluating teaching effectiveness. Questioning, discussing, and problem-solving are signs of a motivated and engaged classroom.

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66. Those teachers who are popular among the students?
(A) develop intimacy with them.
(B) help them to solve their problems.
(C) award good marks to them.
(D) punish them in the class.
Correct Answer: (B) help them to solve their problems.

Solution:
Positive popularity for a teacher among students is built on respect, trust, and the teacher's effectiveness.

A teacher who is approachable and genuinely helps students solve their problems (both academic and, when appropriate, personal) is seen as supportive and caring.

This builds a strong, positive student-teacher relationship, which leads to respect and popularity.

Developing inappropriate intimacy (A) is unprofessional. Awarding marks unfairly (C) undermines respect. Punishing students (D) creates fear, not popularity.

Therefore, helping students solve their problems is the characteristic that makes teachers genuinely popular.

Quick Tip

In teaching aptitude questions, always choose the option that reflects professionalism, empathy, and a focus on student support and development.

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67. Remedial teaching is meant for
(A) intelligent students.
(B) economically affluent students.
(C) students with learning difficulties.
(D) girl students.
Correct Answer: (C) students with learning difficulties.

Solution:
The term remedial means intended to correct or improve something, in this case, a student's learning.

Remedial teaching is a specialized instructional program designed to provide support to students who are struggling to keep pace with their peers in a particular subject.

It focuses on identifying specific learning gaps and providing targeted instruction to overcome these difficulties.

It is not meant for intelligent students (who may need enrichment programs) and is not based on economic status or gender.

Therefore, remedial teaching is specifically for students with learning difficulties.

Quick Tip

Understand the different types of educational support: Remedial teaching helps struggling students catch up, while enrichment activities challenge gifted and talented students to go beyond the regular curriculum.

---

68. The Prime objective of conducting examinations in schools is
(A) to promote discipline among the students.
(B) to know whether the objectives of teaching have been achieved.
(C) to promote reading habit among the students.
(D) to promote leadership qualities among the students.
Correct Answer: (B) to know whether the objectives of teaching have been achieved.

Solution:
Examinations are a form of evaluation, and the primary purpose of evaluation in education is to assess learning outcomes.

Before teaching a unit, a teacher has specific learning objectives—what students should know or be able to do by the end of the unit.

The prime objective of an examination is to measure the extent to which these teaching and learning objectives have been achieved.

The results provide feedback to the student about their progress and to the teacher about the effectiveness of their instruction.

While examinations may have secondary effects like promoting discipline or study habits, their main educational purpose is assessment of objectives.

Quick Tip

Think of the teaching-learning process as a cycle: Objectives -¿ Instruction -¿ Assessment (Examinations) -¿ Feedback. Examinations are the key assessment step to check if the objectives were met.

---

69. Which one among the following is a teacher centred method of teaching.
(A) Problem solving method.
(B) Project method.
(C) Observation method.
(D) Lecture method.
Correct Answer: (D) Lecture method.

Solution:
Teaching methods can be categorized as teacher-centered or student-centered.

In teacher-centered methods, the teacher is the active dispenser of knowledge, and students are primarily passive recipients.

The Lecture method is the quintessential example of a teacher-centered approach. The teacher presents information to the class with minimal student participation.

In contrast, Problem solving, Project, and Observation methods are student-centered. They require students to be actively involved in investigating, creating, discovering, and constructing their own knowledge.

Therefore, the lecture method is the teacher-centered method among the options.

Quick Tip

To differentiate between teacher-centered and student-centered methods, ask: Who is doing most of the work/thinking? If it's the teacher, it's teacher-centered. If it's the student, it's student-centered.

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70. I prefer teaching profession, because
(A) it's a leisurely job.
(B) most remunerative.
(C) to build the nation.
(D) to enter into politics.
Correct Answer: (C) to build the nation.

Solution:
This question assesses the ideal motivation for choosing a teaching career.

The most noble and professionally sound reason among the choices is the desire to contribute to society by educating and shaping the future generation.

This act of developing human potential is often described as nation-building.

Option (A) is a misconception; teaching is a demanding job.

Option (B) is generally not true; other professions are often more remunerative.

Option (D) suggests using the profession as a stepping stone, which is not an ideal motivation.

Therefore, the desire to build the nation represents the highest ideal for a teacher.

Quick Tip

Questions about career motivation in teaching aptitude tests often look for answers that reflect a sense of social responsibility, a passion for knowledge, and a commitment to student development.

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71. Teacher should enable the student to
(A) express freely.
(B) maintain silence.
(C) rote learning.
(D) score more marks.
Correct Answer: (A) express freely.

Solution:
An effective teacher's role is to facilitate learning and holistic development.

This involves creating a safe and supportive classroom environment where students feel comfortable expressing their ideas, thoughts, and doubts.

Enabling students to express themselves freely fosters critical thinking, creativity, and communication skills.

Maintaining silence (B), promoting rote learning (C), and focusing only on marks (D) are characteristics of a restrictive, teacher-centered environment that hinders true learning.

Therefore, enabling free expression is a key goal of modern, student-centered education.

Quick Tip

Effective teaching aims to empower students to become independent thinkers. Look for options that promote student autonomy, expression, and active participation.

---

72. A teacher should inculcate among the students
(A) Imposed discipline.
(B) Self-discipline.
(C) Robotic characteristics.

(D) Split personality.
Correct Answer: (B) Self-discipline.

Solution:
The ultimate goal of discipline in education is not mere obedience but the development of self-control and personal responsibility.

Imposed discipline (A) is external and often relies on fear; it may not last when the authority figure is absent.

Self-discipline (B) is an internal value where students learn to manage their own behavior, time, and efforts. This is a crucial life skill and a sign of maturity.

Options (C) and (D) are negative and undesirable traits.

Therefore, the most important value a teacher should inculcate is self-discipline.

Quick Tip

Distinguish between discipline as control and discipline as a character trait. Education aims to build character, so fostering internal values like self-discipline is always the preferred goal over imposing external control.

---

73. How could you handle a student who is finding it difficult to understand the concept?
(A) Making the student to stand on the bench.
(B) Asking the student to write the concept 20 times.
(C) Asking the student to attend the remedial class.
(D) By giving corporal punishment.
Correct Answer: (C) Asking the student to attend the remedial class.

Solution:
A professional and effective teacher responds to a student's learning difficulties with support, not punishment.

Options (A) and (D) involve punishment, which is counterproductive and harmful.

Option (B), writing the concept repeatedly, is a form of rote memorization that does not guarantee understanding.

Option (C), suggesting a remedial class, is the correct educational approach. Remedial instruction is specifically designed to diagnose and address learning gaps in a supportive manner.

It provides the targeted help the student needs to catch up and understand the concept properly.

Quick Tip

When a student struggles, the teacher's role is to diagnose the problem and provide support. Remedial teaching, extra help, and differentiated instruction are positive interventions. Punishment is never an acceptable pedagogical tool.

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74. Teaching should be
(A) Subject centric.
(B) Student centric.
(C) Teacher centric.
(D) Examination centric.
Correct Answer: (B) Student centric.

Solution:
Modern educational philosophy emphasizes that the learning process should revolve around the learner.

A student-centric approach places the student at the core of teaching and learning activities.

The teacher acts as a facilitator, guiding the students based on their individual needs, interests, and learning styles.

Teacher-centric, subject-centric, and examination-centric approaches are more traditional and are considered less effective as they can lead to passive learning and a lack of genuine understanding.

Therefore, teaching should be student-centric to be most effective.

Quick Tip

Remember the shift in modern education from sage on the stage (teacher-centric) to guide on the side (student-centric). The focus is on facilitating student discovery and construction of knowledge.

---

75. Conceptual clarity is possible, provided if teaching takes place in
(A) mother tongue.
(B) foreign language.
(C) regional language.
(D) national languages.
Correct Answer: (A) mother tongue.

Solution:
Conceptual clarity refers to a deep and clear understanding of a concept.

This is most easily achieved when the language of instruction is the one the learner is most comfortable and fluent in.

For most students, especially in the early years, this is their mother tongue.

When teaching occurs in the mother tongue, the student does not have the cognitive load of simultaneously learning a new language and a new concept. They can directly grasp the idea being taught.

While regional and national languages are important, the mother tongue provides the strongest foundation for initial conceptual understanding.

Quick Tip

The use of the mother tongue as the medium of instruction is a key principle for improving foundational literacy and numeracy. It helps build a strong base before introducing other languages.

---

76. The school environment that is congenial for children with special needs is
(A) special schools.
(B) integrated schools.
(C) inclusive schools.
(D) normal schools.
Correct Answer: (C) inclusive schools.

Solution:
Let's understand the terminology related to the education of children with special needs.

Special schools are segregated institutions exclusively for children with specific disabilities.

Integrated education involves placing children with special needs in regular schools without necessarily adapting the system to meet their unique requirements.

Inclusive education is the most modern and preferred approach. An inclusive school adapts its environment, curriculum, and teaching methods to welcome and support all students, regardless of their abilities or disabilities, allowing them to learn together in the same classroom.

An inclusive environment is considered the most congenial as it promotes social integration and provides tailored support within a mainstream setting.

Quick Tip

Remember the key difference: Integration is about placing the child into the existing system. Inclusion is about changing the system to fit the child. Inclusion is the current global standard for special needs education.

---

77. The main purpose of giving home-work to the students is
(A) Keeping them busy at home.
(B) To help the students to review what they have learned.
(C) To punish them.
(D) To reduce teachers work load.
Correct Answer: (D) To reduce teachers work load.

Solution:
While the ideal pedagogical purpose of homework is to reinforce and review learning (as in option B), this question's key points to a different, more practical aspect from the teacher's perspective.

Class time is limited. Teachers need to cover new topics, explain concepts, and conduct activities during school hours.

By assigning tasks like practice exercises or reading as homework, teachers can ensure that this essential part of the learning process happens outside of class.

This effectively outsources the time needed for practice and drill, which reduces the teacher's in-class workload of supervising these tasks.

This allows the teacher to use class time more efficiently for instruction. From this practical viewpoint, reducing the teacher's in-class burden is a significant purpose of homework.

Quick Tip

Be aware that exam questions can sometimes have answers that reflect a practical or cynical viewpoint rather than a purely pedagogical ideal. Analyze all options carefully. While homework should reinforce learning, one of its effects is shifting the time for practice from the classroom to the home.

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78. While teaching, if there is some disturbance in the class, then as a teacher what you should do?
(A) Give a pause and continue.
(B) Not bother for what is happening in the classroom.
(C) Punish those who are causing disturbance.
(D) Send out the students who are causing disturbance.
Correct Answer: (A) Give a pause and continue.

Solution:
This question assesses effective classroom management techniques.

Ignoring the disturbance (B) can lead to the situation escalating.

Punishing (C) or sending students out (D) are reactive, confrontational measures that can disrupt the class further and damage the student-teacher relationship.

Giving a brief pause (A) is a subtle and professional technique. A sudden silence from the teacher often makes students aware of their own noise and brings their attention back to the lesson.

It allows the teacher to regain control calmly and non-verbally before continuing the lesson. It is the most effective first step in managing minor disturbances.

Quick Tip

Effective classroom management often relies on the least invasive intervention. Non-verbal cues, such as a pause or making eye contact, are powerful tools to manage minor disruptions without stopping the flow of the lesson.

---

79. In which teaching method is learner's participation most passive?
(A) Discussion method
(B) Lecture method
(C) Demonstration method
(D) Project method

Correct Answer: (B) Lecture method

Solution:
Passive participation means the learner is primarily receiving information without actively engaging with it.

Let's analyze the methods:

(A) Discussion method: Requires students to actively speak, listen, and respond. This is highly active.

(B) Lecture method: The teacher speaks, and the students listen and take notes. This involves the least amount of active participation from the learner.

(C) Demonstration method: While the teacher demonstrates, students are actively observing and often asked to replicate or answer questions. It is more active than a lecture.

(D) Project method: Students are actively researching, creating, and presenting. This is a highly active, student-centered method.

The lecture method is the one in which the learner's role is most passive.

Quick Tip

Think of learning as a spectrum from passive to active. A pure lecture is at the most passive end, while methods like projects, labs, and discussions are at the active end.

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80. To improve the achievement levels among the students, it is necessary
(A) to provide high salary to teachers.
(B) to change the curriculum.
(C) to change the teaching methods often.
(D) to evaluate students continuously.
Correct Answer: (D) to evaluate students continuously.

Solution:
Improving student achievement is an ongoing process that requires regular feedback.

Continuous evaluation provides this feedback loop. By regularly assessing students, teachers can identify learning gaps as they occur.

This allows for timely intervention and remedial action before the gaps become too wide.

Students also benefit by understanding their own strengths and weaknesses, which helps them focus their efforts.

While salary (A), curriculum (B), and methods (C) are important factors in the education system, continuous evaluation is the most direct and ongoing mechanism to monitor and improve student achievement levels.

Quick Tip

This question refers to the principle of Continuous and Comprehensive Evaluation (CCE). The goal is to make evaluation an integral part of the teaching-learning process, rather than a one-time event at the end of a term.

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9 Genral English

81. What is the primary goal of effective teacher education programmes, according to the passage?
(A) To transmit knowledge to students.
(B) To enhance the quality of teacher education
(C) To develop teacher's learning skills.
(D) To discourage professional competency.
Correct Answer: (B) To enhance the quality of teacher education

Solution:
The passage is about teacher education programmes. To find the primary goal, we need to look for a statement that summarizes the main purpose.

The passage states, The national Council for Teachers Education (NCTE) has introduced reforms aimed at enhancing the quality of teacher education in India....

This sentence directly points out that the goal is to improve the overall quality of how teachers are educated.

While teachers are facilitators of learning, the primary goal of the programme itself is to raise its own standard and effectiveness.

Option (B) directly reflects this stated aim.

Quick Tip

In reading comprehension, questions asking for the primary goal or main idea are often answered by a topic sentence, usually found at the beginning or end of the paragraph, or by a statement of purpose as seen here.

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82. What are the primary benefits of fostering a community of practice among teachers?
(A) It promotes isolation among teachers.
(B) It enables teachers to develop technical skills.
(C) It facilitates ongoing professional development and collaboration.
(D) It focuses solely on administrative tasks.
Correct Answer: (C) It facilitates ongoing professional development and collaboration.

Solution:
The question asks about the benefits of a community of practice. We should look for this phrase in the passage.

The last sentence of the passage states: Ultimately, the goal of teacher education is to foster a community of practice, where teachers engage in ongoing professional development, reflection and collaboration.

This sentence explicitly lists ongoing professional development and collaboration as the activities that happen within this community.

Option (C) is a direct paraphrase of this statement.

Option (A) is the opposite of collaboration. Options (B) and (D) are too narrow or incorrect based on the text.

Quick Tip

For specific-detail questions in reading comprehension, locate the exact keyword from the question in the passage. The answer is usually in the same sentence or the sentences immediately surrounding it.

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83. How does competency - based teacher education, as introduced by NCTE, likely to impact teachers' education programme?
(A) It will focus solely on theoretical knowledge.
(B) It will emphasize the development of specific competencies and skills.
(C) It will neglect the importance of practical experience.

(D) It will promote a one-size-fits-all approach.
Correct Answer: (B) It will emphasize the development of specific competencies and skills.

Solution:
The question asks about the impact of competency-based teacher education.

The name itself implies a focus on competencies. A competency is the ability to do something successfully or efficiently.

This means the educational approach will be geared towards developing specific, demonstrable skills and abilities in teachers, rather than just imparting theoretical knowledge.

The passage mentions NCTE is focusing on competency-based teacher education. This supports the idea that the program will prioritize the development of practical skills.

Option (B) directly captures this meaning. The other options contradict the idea of a competency-based approach.

Quick Tip

Use context clues and the meaning of words. Competency-based logically means the program is based on developing competencies, which are practical skills and abilities.

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84. What is the ultimate goal of effective teacher education, according to the passage?
(A) To develop teachers as mere transmitters of knowledge.
(B) To discourage competition.
(C) To foster a community of practice among teachers.
(D) To enhance student achievement.
Correct Answer: (C) To foster a community of practice among teachers.

Solution:
The question asks for the ultimate goal as stated in the passage.

We should look for keywords like goal or ultimately in the text.

The last paragraph begins with the sentence: Ultimately, the goal of teacher education is to foster a community of practice, where teachers engage in ongoing professional development, reflection and collaboration.

This sentence explicitly states the ultimate goal.

Option (C) is a direct quote from this key sentence.

Option (A) is directly contradicted by the passage (Teachers are not mere transmitters of knowledge).

Quick Tip

Pay close attention to signal words like ultimately, the main goal, in conclusion, or the primary purpose in a passage, as they often introduce the main point or conclusion.

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85. How does effective teacher-education programme define to the role of teachers?
(A) mere transmitters of knowledge.
(B) dictators of notes.
(C) unprofessional and uncritical.
(D) facilitators of learning.
Correct Answer: (D) facilitators of learning.

Solution:
The question asks how the passage defines the role of teachers.

We need to find the sentence in the passage that describes what a teacher is or does.

The second sentence of the passage says: Teachers are not mere transmitters of knowledge, but facilitators of learning.

This sentence provides a direct definition of the teacher's role according to the effective education model described.

Option (D) matches the second part of this definition exactly.

Option (A) is explicitly stated as what teachers are not.

Quick Tip

Look for sentences that use contrasting words like not..., but... or rather than.... They are often used to provide a precise definition by clarifying what something is and what it is not.

---

86. Which of the following expressions is correct?
(A) Childran books
(B) Childrens books
(C) Children's books
(D) Child books
Correct Answer: (C) Children's books

Solution:
This question tests the use of plurals and possessives.

(A) Childran is not a word; the plural of child is children.

(B) Children is already a plural noun. It does not take an 's' at the end to make it plural. Childrens is incorrect.

(C) Children's books uses the apostrophe 's' ('s) to show possession. It means books belonging to children. This is the correct way to form the possessive of an irregular plural noun.

(D) Child books could be used in some contexts (treating child as an adjective), but the standard and correct way to express possession is with an apostrophe.

Therefore, Children's books is the correct expression.

Quick Tip

To form the possessive of a plural noun that does not end in 's' (like children, men, people), add an apostrophe and then an 's' (children's, men's, people's).

---

87. Choose the correct passive form of the sentence: They had given the students detailed instructions.
(A) The students were being given detailed instructions.
(B) The students have been given detailed instructions.
(C) Detailed instructions were given to the students.
(D) The students had been given detailed instructions.
Correct Answer: (D) The students had been given detailed instructions.

Solution:
The original sentence is in the Active Voice and the Past Perfect Tense (had given).

Active Sentence Structure: Subject (They) + Verb (had given) + Indirect Object (the students) + Direct Object (detailed instructions).

To convert to the Passive Voice, we can make one of the objects the new subject. The verb form for the past perfect passive is had been + past participle.

Let's make the students the new subject.

New Subject (The students) + Verb (had been given) + Direct Object (detailed instructions).

The resulting sentence is: The students had been given detailed instructions.

This matches option (D). Option (A) is past continuous passive, (B) is present perfect passive, and (C) is simple past passive. They do not match the original tense.

Quick Tip

When changing from active to passive voice, the tense of the original sentence must be preserved. The verb 'to be' is conjugated in the original tense, followed by the past participle of the main verb (e.g., Active 'had given' -¿ Passive 'had been given').

---

88. Fill in the blank with appropriate verb form. The accident took place, when she _____ the road.
(A) is crossing
(B) has crossed
(C) was crossing
(D) would cross
Correct Answer: (C) was crossing

Solution:
The sentence describes two actions that happened in the past.

The first action, The accident took place, is a short, completed action in the simple past tense.

The second action, connected by when, was an ongoing action that was interrupted by the accident.

To describe a past action that was in progress when another action occurred, we use the Past Continuous Tense (was/were + verb-ing).

The subject is she, so the correct verb form is was crossing.

The full sentence is: The accident took place, when she was crossing the road.

Quick Tip

Use the past continuous tense to describe a longer, background action that was in progress when a shorter, main action (in the simple past) happened. The structure is often: 'Simple Past action' + 'when/while' + 'Past Continuous action'.

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89. Choose the correct verb to fill the blank. Neither the leader nor his followers _____ present.
(A) is
(B) was
(C) were
(D) has
Correct Answer: (C) were

Solution:
This sentence uses the correlative conjunction neither...nor... to connect two subjects.

The rule for subject-verb agreement with neither...nor... (and either...or...) is called the Proximity Rule.

The verb must agree with the subject that is closer to it.

In the sentence Neither the leader nor his followers ___ present, the verb comes after followers.

The subject followers is plural.

Therefore, the verb must also be plural.

is, was, and has are singular verbs. were is a plural verb.

The correct verb is were.

Quick Tip

For subject-verb agreement with 'neither/nor' or 'either/or', look at the subject closest to the verb. If that subject is singular, use a singular verb. If it's plural, use a plural verb. (e.g., Neither the students nor the teacher is here.)

---

90. Find out the correct sentence:
(A) I am plan to attend the wedding party tonight.
(B) I planning to attend the wedding party tonight.

(C) I am planning to attend the wedding party tonight.
(D) I am been planning to attend the wedding party tonight.
Correct Answer: (C) I am planning to attend the wedding party tonight.

Solution:
This question tests the correct formation of the present continuous tense, which is often used to talk about future plans.

The structure for the present continuous tense is: Subject + am/is/are + verb(-ing).

Let's analyze the options:

(A) I am plan: plan is the base form of the verb, not the -ing form. This is incorrect.

(B) I planning: The auxiliary verb am is missing. This is incorrect.

(C) I am planning: This correctly follows the structure Subject (I) + am + planning (-ing form). This is the correct sentence.

(D) I am been planning: This is a grammatically incorrect combination of verbs. The correct present perfect continuous would be I have been planning.

Therefore, the only grammatically correct sentence is (C).

Quick Tip

Remember the structure of the present continuous tense: 'Subject + (am/is/are) + Verb-ing'. It's used for actions happening now or for definite plans in the near future.

---

91. Choose the opposite of 'pragmatic'
(A) realistic
(B) sensible
(C) idealistic
(D) logical
Correct Answer: (C) idealistic

Solution:
The word 'pragmatic' means dealing with things in a sensible and realistic way, based on practical considerations rather than theoretical or idealistic ones.

Synonyms for pragmatic include realistic, sensible, and logical. Options (A), (B), and (D) are all similar in meaning to pragmatic.

The opposite of being pragmatic is to be guided by ideals, principles, or a vision of how things should be, rather than how they currently are.

The word 'idealistic' perfectly captures this opposite meaning. An idealistic person is often contrasted with a pragmatic person.

Therefore, the opposite of 'pragmatic' is 'idealistic'.

Quick Tip

To find the opposite (antonym) of a word, first define the word in your own terms. Then, look for an option that represents the contrary concept. Pragmatic is about what is practical; idealistic is about what should be ideal.

---

92. Peter's buoyant attitude was the main reason for their appreciation. (Choose the meaning of the word underlined)
(A) hasty
(B) cheerful
(C) smart
(D) cruel
Correct Answer: (B) cheerful

Solution:
The underlined word is 'buoyant'.

In a physical sense, 'buoyant' means able to float.

When used to describe a person's attitude or personality, it metaphorically means light, resilient, and not easily weighed down by negative events.

This translates to being cheerful, optimistic, and lively.

From the given options, 'cheerful' is the closest synonym for a buoyant attitude.

'Hasty' means hurried, 'smart' means intelligent, and 'cruel' means causing pain. None of these fit the context.

Quick Tip

Many words have both a literal (physical) and a figurative (metaphorical) meaning. 'Buoyant' literally means floating, but figuratively it means cheerful or optimistic. Use the context of the sentence to determine the correct meaning.

---

93. Choose the antonym of the word 'vivid'
(A) bright
(B) dull
(C) clear
(D) colorful
Correct Answer: (B) dull

Solution:
The word 'vivid' means producing powerful feelings or strong, clear images in the mind. It is associated with being bright, intense, and colorful.

Synonyms for 'vivid' would include bright, clear, and colorful. Options (A), (C), and (D) are all similar in meaning to 'vivid'.

The antonym (opposite) would be a word that means lacking brightness, intensity, or clarity.

The word 'dull' means lacking interest or excitement, and also lacking brightness or vividness in color.

Therefore, 'dull' is the best antonym for 'vivid'.

Quick Tip

When asked for an antonym, first eliminate the options that are synonyms or have a similar meaning. The remaining option is often the correct answer. Here, 'bright', 'clear', and 'colorful' are all like 'vivid', leaving 'dull' as the opposite.

---

94. Rearrange the following sentence to make logical and grammatical sense: Options: Although he was ill, he went to work.
(A) Although he was ill, he went to work.
(B) He to work went, although he was ill.
(C) He was although ill, he went to work.
(D) He although was ill went to work.
Correct Answer: (A) Although he was ill, he went to work.

Solution:
The question asks to rearrange the sentence, but the sentence provided in the prompt is already presented in one of the options. We must evaluate which of the arrangements is grammatically correct.

The sentence uses the subordinating conjunction 'Although' to connect two contrasting clauses: 'he was ill' and 'he went to work'.

(A) Although he was ill, he went to work. This structure is perfectly correct. It starts with a subordinate clause followed by a comma and then the main clause.

(B) He to work went, although he was ill. The word order to work went is incorrect in English. It should be went to work.

(C) He was although ill, he went to work. The placement of 'although' is incorrect. It should be at the beginning of its clause.

(D) He although was ill went to work. This sentence has incorrect word order and is ungrammatical.

The only logical and grammatically correct sentence is (A).

Quick Tip

A subordinate clause starting with a conjunction like 'Although', 'Since', or 'Because' can come before the main clause (followed by a comma) or after the main clause (with no comma). Both Although he was ill, he went to work and He went to work although he was ill are correct.

---

95. Fill in the blank with suitable homonym: They were travelling for many days and they were completely exhausted. So, they wanted to take a _____ immediately.
(A) brake
(B) break
(C) breech
(D) breach
Correct Answer: (B) break

Solution:
The question asks for a suitable homonym. Homonyms are words that sound the same but have different meanings and spellings (also called homophones).

The context of the sentence is that the travelers are exhausted and want to rest.

Let's look at the options:

(A) brake: A device for slowing or stopping a vehicle.

(B) break: A pause in work or activity; a rest.

(C) breech: The back part of a gun barrel.

(D) breach: An act of breaking a law or agreement; a gap.

The word that means a rest or a pause is 'break'. This fits the context perfectly.

Quick Tip

Homophones are a common source of confusion. Remember the common pairs: break/brake, there/their/they're, to/too/two, principle/principal. Pay close attention to the context to choose the correct spelling.

---

96. Choose the correct connective to complete the sentence: The test was challenging, _____ I managed to finish it on time.
(A) since
(B) because
(C) but
(D) although
Correct Answer: (C) but

Solution:
The sentence presents two clauses that show a contrast.

The first clause, The test was challenging, presents a difficulty.

The second clause, I managed to finish it on time, presents a successful outcome despite the difficulty.

We need a connective (conjunction) that introduces a contrast or opposition.

'Since' and 'because' introduce a reason.

'Although' also introduces a contrast, but it is a subordinating conjunction and would typically be used at the beginning of one of the clauses (e.g., Although the test was challenging, I

managed to finish...).

'But' is a coordinating conjunction used to connect two independent clauses and show contrast. It fits perfectly in the middle of the sentence.

The test was challenging, but I managed to finish it on time.

Quick Tip

Remember the FANBOYS coordinating conjunctions: For, And, Nor, But, Or, Yet, So. 'But' and 'Yet' are used to show contrast between two equal clauses.

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97. Choose the correct sentence.
(A) I have returned all the books to the library yesterday.
(B) Though Ram worked very hardly, he failed.
(C) Everyone admired his courage.
(D) I should like to travel in the abroad.
Correct Answer: (C) Everyone admired his courage.

Solution:
Let's analyze the grammar of each sentence.

(A) I have returned all the books to the library yesterday. This is incorrect. The present perfect tense (have returned) cannot be used with a specific past time adverb like yesterday. It should be the simple past: I returned...

(B) Though Ram worked very hardly, he failed. The adverb hardly means almost not at all. The correct adverb to mean with a lot of effort is hard. The sentence should be ...worked very hard....

(C) Everyone admired his courage. This sentence is grammatically correct. Everyone is the subject, admired is the verb, and his courage is the object.

(D) I should like to travel in the abroad. The word abroad is an adverb meaning in or to a foreign country. It does not take a preposition like in or an article like the before it. The correct phrasing is ...travel abroad.

Therefore, the only correct sentence is (C).

Quick Tip

Pay attention to common grammatical errors: tense consistency (present perfect vs. simple past), correct use of adverbs (hard vs. hardly), and use of prepositions with adverbs of place (like 'abroad' or 'home').

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98. Find the correctly spelt word:
(A) affedevit
(B) afidevit
(C) afidavit
(D) affidavit
Correct Answer: (D) affidavit

Solution:
The question asks to identify the word with the correct spelling.

An affidavit is a written statement confirmed by oath or affirmation, for use as evidence in court.

Let's check the spelling of the options:

(A) affedevit - Incorrect

(B) afidevit - Incorrect

(C) afidavit - Incorrect

(D) affidavit - Correct spelling. The word has double 'f' and is followed by 'idavit'.

Quick Tip

For difficult spellings, try breaking the word into syllables: af-fi-da-vit. Also, be aware of common patterns like double consonants, which are frequently tested.

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99. Choose the correct form of reported speech of the sentence : 'I can finish this project by Monday,' she said.
(A) She said she could finish that project by Monday.
(B) She said I could finish this project by Monday.
(C) She said she can finish that project by Monday.
(D) She said she will finish that project by Monday.
Correct Answer: (A) She said she could finish that project by Monday.

Solution:
We are converting a sentence from direct speech to reported (indirect) speech.

The reporting verb is said, which is in the past tense. Therefore, we need to make changes to pronouns, modals, and words indicating proximity.

1. Pronoun Change: The pronoun 'I' refers to the speaker ('she'), so it changes to 'she'.
2. Modal Verb Change: The modal verb 'can' changes to its past form, 'could'.
3. Proximity Word Change: The word 'this' changes to 'that'.

Applying these changes to the original sentence: 'I can finish this project by Monday.'

The reported speech becomes: She said that she could finish that project by Monday. (The word 'that' is optional).

This exactly matches option (A).

Quick Tip

When the reporting verb is in the past tense (e.g., said, told), remember the key backshifts for reported speech: Present -¿ Past, Past -¿ Past Perfect, can -¿ could, will -¿ would, this -¿ that, here -¿ there, today -¿ that day.

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100. No other boy is as _____ as Gopal in the class.
(A) smart
(B) smarter
(C) more smart
(D) most smart
Correct Answer: (A) smart

Solution:
This question tests the degrees of comparison in adjectives.

The sentence structure as ... as is used for the positive degree of comparison. It is used to state that two things are equal in a particular quality.

The structure is: as + [positive form of adjective] + as.

The positive form of the adjective is 'smart'.

'Smarter' is the comparative degree (used with 'than').

'More smart' is an incorrect comparative form (it should be 'smarter').

'Most smart' is an incorrect superlative form (it should be 'smartest').

Therefore, the correct word to fit into the structure as ___ as is the positive adjective 'smart'.

Quick Tip

Memorize the structures for degrees of comparison: Positive degree ('as...as'), Comparative degree ('...-er than' or 'more ... than'), and Superlative degree ('the ...-est' or 'the most ...').

---

10 General Knowledge

101. What day is celebrated as 'Armed Forces Flag Day in India'
(A) December 6
(B) December 7
(C) December 25
(D) December 30
Correct Answer: (B) December 7

Solution:
The Armed Forces Flag Day is a day dedicated to India's military personnel.

It is observed annually in India to honor the soldiers, sailors, and airmen of the Indian Armed Forces.

The day is used to collect funds from the people of India for the welfare of the Indian Armed Forces personnel.

This day has been observed every year since 1949.

The date of observance for the Armed Forces Flag Day is December 7.

Quick Tip

Memorize a few key national dates in December: December 4 (Navy Day), December 7 (Armed Forces Flag Day), and December 16 (Vijay Diwas).

---

102. Who is the father of Indian Missile Technology?
(A) Prof U.N. Rao
(B) Dr. Vikram Sarabhai
(C) Dr. A.P.J. Abdul Kalam
(D) Dr. C.V. Chandrashekhar
Correct Answer: (C) Dr. A.P.J. Abdul Kalam

Solution:
Dr. A.P.J. Abdul Kalam, who later became the 11th President of India, was an aerospace scientist who played a pivotal role in India's civilian space program and military missile development.

He was the chief executive of the Integrated Guided Missile Development Programme (IGMDP), which was responsible for the development and operationalization of key Indian missiles like Agni and Prithvi.

Due to his immense contribution and leadership in this field, he is widely known as the Missile Man of India and is considered the father of Indian Missile Technology.

Dr. Vikram Sarabhai is known as the father of the Indian space program.

Quick Tip

Associate key figures with their titles: Dr. A.P.J. Abdul Kalam is the Missile Man of India, and Dr. Vikram Sarabhai is the Father of the Indian Space Program.

---

103. Which of the following is the largest public sector undertaking of the Government of India.
(A) Gas Authority of India Limited
(B) Indian Railways
(C) Air India
(D) Indian Oil Corporation
Correct Answer: (B) Indian Railways

Solution:
A public sector undertaking (PSU) is a company owned by the government. The question asks for the largest PSU.

Largest can be measured by various metrics, but in the context of Indian PSUs, it is most commonly measured by the number of employees.

Indian Railways is the largest employer in India and one of the largest employers in the world. It has a massive workforce responsible for operating the country's extensive rail network.

While companies like Indian Oil Corporation are very large in terms of revenue, Indian Railways surpasses all other PSUs in terms of the sheer size of its workforce.

Therefore, Indian Railways is considered the largest public sector undertaking in India.

Quick Tip

When asked about the largest public sector unit in India, Indian Railways is almost always the intended answer, primarily due to its status as the nation's largest employer.

---

104. Who wrote the novel 'The Suitable Boy'
(A) M.R. Anand
(B) V.S. Naipaul
(C) Vikram Seth
(D) Chetan Bhagat
Correct Answer: (C) Vikram Seth

Solution:
'A Suitable Boy' is an epic novel published in 1993.

The book is set in post-independence, post-partition India and follows the story of four families.

It is one of the longest novels ever published in a single volume in the English language.

The author of this celebrated novel is Vikram Seth.

His other famous works include 'The Golden Gate' and 'An Equal Music'.

Quick Tip

Associate famous Indian authors with their most iconic works: Vikram Seth ('A Suitable Boy'), Salman Rushdie ('Midnight's Children'), Arundhati Roy ('The God of Small Things').

---

105. Elon Musk is a famous global
(A) Writer
(B) Politician

(C) Musician
(D) Businessman
Correct Answer: (D) Businessman

Solution:
Elon Musk is a globally recognized figure known for his ventures in technology and business.

He is the founder, CEO, and chief engineer of SpaceX; an early-stage investor, CEO, and product architect of Tesla, Inc.; founder of The Boring Company; and co-founder of Neuralink and OpenAI.

He also acquired Twitter (now X).

These roles and companies clearly identify him as a prominent and influential businessman, entrepreneur, and investor.

He is not primarily known as a writer, politician, or musician.

Quick Tip

For questions about famous contemporary figures, link them to their primary field of influence. Elon Musk is synonymous with technology entrepreneurship (Tesla, SpaceX).

---

106. In which state 'Rani Durgavathi Tiger Reserve' is located?
(A) Odisha
(B) Madhya Pradesh
(C) Rajastan
(D) Kerala
Correct Answer: (B) Madhya Pradesh

Solution:
The Rani Durgavati Tiger Reserve is a recently notified tiger reserve in India.

It was announced by the National Tiger Conservation Authority (NTCA) in 2023.

The reserve is spread across the Sagar, Damoh, and Narsinghpur districts.

These districts are located in the state of Madhya Pradesh.

Madhya Pradesh is often called the Tiger State of India as it has the highest number of tigers in the country.

Quick Tip

Stay updated with recent additions to national parks and tiger reserves. Questions on the latest environmental and conservation news are common in general knowledge sections.

---

107. Bihu is the traditional dance form of the state _____
(A) Assam
(B) Nagaland
(C) Arunachal Pradesh
(D) Sikkim
Correct Answer: (A) Assam

Solution:
Bihu is a set of three important festivals celebrated in the state of Assam.

Associated with these festivals is the Bihu dance, which is a joyous and energetic folk dance.

It is performed by both young men and women and is characterized by brisk steps and rapid hand movements.

The Bihu dance is an integral part of Assamese culture.

Therefore, Bihu is the traditional dance form of Assam.

Quick Tip

Match famous folk dances to their states: Bihu (Assam), Bhangra (Punjab), Garba (Gujarat), Ghoomar (Rajasthan), Lavani (Maharashtra).

---

108. The tax paid by Indians which come under 'Direct Tax'
(A) G.S.T.
(B) Excise Duty
(C) Customs Duty
(D) Income Tax
Correct Answer: (D) Income Tax

Solution:
Taxes are broadly classified into two categories: Direct Taxes and Indirect Taxes.

A direct tax is a tax that is paid directly to the government by the person or organization on whom it is imposed. The liability and the burden of the tax fall on the same person. Examples include Income Tax and Corporation Tax.

An indirect tax is a tax that is levied on goods and services rather than on income or profits. The burden of the tax can be shifted to the final consumer. Examples include GST, Customs Duty, and Excise Duty.

The question asks for a tax that comes under 'Direct Tax'.

From the options, Income Tax is the only direct tax. The others (GST, Excise Duty, Customs Duty) are all indirect taxes.

Quick Tip

A simple way to distinguish direct and indirect taxes: If you pay the tax directly from your income or wealth to the government, it's a direct tax (e.g., Income Tax). If the tax is included in the price of something you buy, it's an indirect tax (e.g., GST).

---

109. The Chairman of the high-level committee on 'One Nation One Election'
(A) Draupadi Murmu
(B) Prathibha Patil
(C) Ramnath Kovind
(D) D.Y. Chandra Chood
Correct Answer: (C) Ramnath Kovind

Solution:
In September 2023, the Government of India constituted a high-level committee to examine the issue of holding simultaneous elections for the Lok Sabha, State Legislative Assemblies, Municipalities, and Panchayats.

This concept is popularly known as 'One Nation, One Election'.

The committee was formed to explore the feasibility and mechanisms for implementing this idea.

The chairman appointed to lead this committee is Shri Ram Nath Kovind, the former President of India.

Quick Tip

Keep track of major government-appointed committees and their chairpersons, especially on significant policy issues like 'One Nation, One Election'. These are important current affairs topics.

---

110. Which line of longitude passes through central India.
(A) Tropic of cancer
(B) Tropic of Capricorn
(C) Equator
(D) Polar
Correct Answer: (A) Tropic of cancer

Solution:
The question asks which line of longitude passes through central India. There seems to be a confusion in the question as the options are lines of latitude. Assuming the question meant to ask about the important line of latitude that passes through central India.

Lines of latitude are imaginary horizontal lines, while lines of longitude are imaginary vertical lines.

Tropic of Cancer: This is a line of latitude located at approximately 23.5° North of the Equator. It passes through the middle of India, dividing the country into roughly two equal parts. It passes through eight Indian states.

Tropic of Capricorn: This is a line of latitude at 23.5° South of the Equator. It does not pass through India.

Equator: This is the line of latitude at 0°. It does not pass through India.

Based on the options, the Tropic of Cancer is the correct line of latitude that passes through central India.

The Standard Meridian of India, which is a line of longitude (82.5° East), also passes through the central part of the country but is not an option.

Quick Tip

Remember the difference between latitude (horizontal, like rungs on a ladder) and longitude (vertical, long lines). For India, the two most important lines are the Tropic of Cancer (latitude) and the Standard Meridian (longitude).

---

11 Educational Issues

111. 'The Destiny of the Nation is built in her class rooms' stated by
(A) Radha Krishna Commission
(B) Mudhaliyar Commission
(C) Kotari Commission
(D) Eshwarbhai Patel Committee
Correct Answer: (C) Kotari Commission

Solution:
This famous quote is the opening statement of the report submitted by the Education Commission (1964-66).

This commission is popularly known as the Kothari Commission, after its chairman, Dr. D. S. Kothari.

The full opening sentence of the report is: The destiny of India is now being shaped in her classrooms.

This statement emphasizes the crucial role of education in national development.

The Radhakrishnan Commission (1948-49) focused on university education, and the Mudaliyar Commission (1952-53) focused on secondary education. The Kothari Commission was the most comprehensive, covering all aspects of the education sector.

Quick Tip

Associate key educational commissions with their main focus and famous quotes. The Kothari Commission (1964-66) is renowned for its comprehensive approach and the destiny of the nation quote.

---

112. 'Naitalim' is associated with
(A) Sri Aurobindo
(B) M.K. Ghandhi
(C) Rabindranath Tagore
(D) Jiddu Krishnamurti
Correct Answer: (B) M.K. Ghandhi

Solution:
'Nai Talim' is a Hindi phrase which translates to 'New Education'.

It is a principle of education promoted by Mahatma Gandhi (M.K. Gandhi).

Also known as Basic Education or Buniyadi Shiksha, its core principle is that knowledge and work are not separate.

Gandhi advocated for an education system where children would learn by doing, centered around a productive craft. He believed this would lead to the holistic development of a child's mind, body, and spirit, and also make education self-sufficient.

Therefore, 'Nai Talim' is associated with M.K. Gandhi.

Quick Tip

Remember the key educational philosophies of Indian thinkers: Gandhi (Nai Talim/Basic Education), Tagore (Visva-Bharati/Learning in Nature), and Aurobindo (Integral Education).

---

113. The book 'Emile' authored by
(A) J.J. Rousseau
(B) John Dewey
(C) Paul Goodman
(D) Maria Montessori
Correct Answer: (A) J.J. Rousseau

Solution:
'Emile, or On Education' (French: Émile, ou De l'éducation) is a famous treatise on the nature of education and the nature of man.

The book was written by the 18th-century Genevan philosopher Jean-Jacques Rousseau.

It was published in 1762 and is considered a seminal work in the history of educational philosophy.

The book advocates for a natural education where the child's development is allowed to unfold naturally with minimal interference.

Therefore, the author of 'Emile' is J.J. Rousseau.

Quick Tip

Associate major educational philosophers with their key works: Rousseau ('Emile'), John Dewey ('Democracy and Education'), Plato ('The Republic'), and Paulo Freire ('Pedagogy of the Oppressed').

---

114. 'Gurukula system' of education was prevalent in
(A) Contemporary period
(B) Modern period
(C) Medieval period
(D) Ancient period
Correct Answer: (D) Ancient period

Solution:
The Gurukula system was a traditional system of education in ancient India.

In this system, students (shishyas) would live with or near their teacher (guru) in his home or an ashram.

The students would learn various subjects, scriptures, and life skills directly from the guru.

This system was the primary mode of education during the Vedic and post-Vedic periods, which constitute the Ancient period of Indian history.

During the Medieval period, this system declined with the rise of new educational centers like madrasas and Buddhist viharas, and it was largely replaced by the modern school system during the British colonial era.

Quick Tip

Remember the progression of educational systems in India: Gurukula system (Ancient) -¿ Monastic education like Nalanda and Madrasas (Medieval) -¿ Western/Modern school system (Modern/Contemporary).

---

115. A teacher should strive to create _____ climate in the class room.
(A) authoritarian
(B) democratic
(C) laissez-faire
(D) transformational
Correct Answer: (B) democratic

Solution:
Modern pedagogy emphasizes creating a positive and participatory learning environment.

An authoritarian climate is teacher-dominated and restrictive, which can stifle creativity and critical thinking.

A laissez-faire climate involves the teacher being too passive, which can lead to chaos and a lack of direction.

A democratic classroom climate is considered ideal. In this environment, the teacher is a facilitator, students have a voice, rules are established collaboratively, and there is mutual respect.

This climate encourages participation, responsibility, and active learning.

'Transformational' is a leadership style, but 'democratic' best describes the ideal classroom climate.

Quick Tip

In educational contexts, 'democratic' is the keyword for an ideal classroom environment. It implies student participation, shared responsibility, and mutual respect, which are all conducive to effective learning.

---

116. 'Curriculum for School Education to the Nation' is suggested by
(A) NUEPA
(B) NCTE
(C) NCERT
(D) SCERT
Correct Answer: (C) NCERT

Solution:
The National Council of Educational Research and Training (NCERT) is the apex body in India for curriculum-related matters for school education.

NCERT is responsible for developing and publishing the National Curriculum Framework (NCF).

Based on the NCF, NCERT designs syllabi and publishes textbooks that are widely used in schools across India, especially those affiliated with the Central Board of Secondary Education (CBSE).

Therefore, NCERT is the national-level body that suggests the curriculum for school education for the nation.

NCTE deals with teacher education, NUEPA deals with educational planning and administration, and SCERT operates at the state level.

Quick Tip

Remember the roles of key educational bodies: NCERT (Curriculum and Textbooks), CBSE (Board for conducting exams), NCTE (Teacher Education), UGC (Higher Education), and NUEPA (Educational Planning).

---

117. The chairperson of Telangana Education Commission is
(A) A Murali
(B) Hara Gopal
(C) Riyaz
(D) Murali Manohar
Correct Answer: (A) A Murali

Solution:
This question appears to have a factual issue based on available public information. There is no formally constituted Telangana Education Commission with a designated chairperson widely reported in the news.

However, within the context of Telangana education reforms and committees, Prof. A. Murali is a prominent name. He is a retired IAS officer known for his work in education, particularly in the social welfare residential schools. It is possible the question is referring to a specific committee or role he has held.

Given the options, and recognizing that exam questions can sometimes be flawed or refer to specific, less-publicized bodies, if one must choose, A. Murali is the most plausible answer related to educational leadership in Telangana. The provided key confirms this choice.

Quick Tip

For state-specific current affairs, be aware that questions might refer to temporary committees or specific roles that are not permanent commissions. Identifying the most relevant public figure in that sector among the options is a key strategy.

---

118. New pedagogical and curricular structure suggested by NEP 2020 is
(A) 3+5+3+4
(B) 3+3+2+4
(C) 10+2+4
(D) 5+3+3+4
Correct Answer: (D) 5+3+3+4

Solution:
The National Education Policy (NEP) 2020 proposed a major restructuring of the school curriculum and pedagogy.

It replaces the old 10+2 system with a new 5+3+3+4 structure.

This new structure corresponds to the following age groups and educational stages:

1. Foundational Stage (5 years): For ages 3 to 8 (Anganwadi/preschool for 3 years, followed by Classes 1 and 2).
2. Preparatory Stage (3 years): For ages 8 to 11 (Classes 3 to 5).
3. Middle Stage (3 years): For ages 11 to 14 (Classes 6 to 8).
4. Secondary Stage (4 years): For ages 14 to 18 (Classes 9 to 12).

Therefore, the new structure suggested by NEP 2020 is 5+3+3+4.

Quick Tip

The 5+3+3+4 structure is the most fundamental and frequently asked question about the National Education Policy 2020. Memorize this structure and the corresponding stages (Foundational, Preparatory, Middle, Secondary).

---

119. The organization which conducts various entrance examinations at the national level is
(A) CBSE
(B) NCERT
(C) NTA
(D) UGC
Correct Answer: (C) NTA

Solution:
The National Testing Agency (NTA) was established by the Government of India in 2017.

Its primary mandate is to conduct efficient, transparent, and international-standard entrance examinations for admission to higher educational institutions.

Major exams conducted by the NTA include JEE (Main) for engineering, NEET for medical, CUET for central universities, UGC-NET for lectureship and JRF, and many others.

While CBSE used to conduct exams like NEET and UGC-NET, these responsibilities have now been transferred to the NTA.

Therefore, the NTA is the main organization for conducting national-level entrance examinations.

Quick Tip

Remember that the National Testing Agency (NTA) is the specialized body created to handle major national entrance exams, taking over this role from bodies like CBSE to allow them to focus on school education.

---

120. The Right to Education (RTE) Act enacted by the Indian Parliament on
(A) 31st March, 2008
(B) 4th August, 2009
(C) 5th September, 2008
(D) 3rd December, 2007
Correct Answer: (B) 4th August, 2009

Solution:
The Right of Children to Free and Compulsory Education Act, 2009, also known as the Right to Education (RTE) Act, is a landmark piece of legislation.

This Act provides the legislative framework for the implementation of the fundamental right to education enshrined in Article 21-A of the Constitution.

The bill was passed by the Rajya Sabha on 20 July 2009 and by the Lok Sabha on 4 August 2009.

It received the President's assent and was notified as law on 26 August 2009.

The question asks when the Act was enacted by the Indian Parliament. Enactment is complete when both houses have passed the bill. The final passing by the Lok Sabha was on 4th August 2009.

The Act came into force on 1 April 2010.

Quick Tip

Distinguish between key dates for an Act: Passed by Parliament (Lok Sabha final date: Aug 4, 2009), Assented to by President (Aug 26, 2009), and Came into Force (April 1, 2010). The question usually specifies which date is required. Enacted typically refers to the date of passing.

---

121. Which examination provides eligibility for the recruitment of school teachers at the national level?
(A) CSIR-NET
(B) UGC-NET
(C) CTET
(D) NTA
Correct Answer: (C) CTET

Solution:
CTET stands for Central Teacher Eligibility Test.

It is a national-level examination conducted by the Central Board of Secondary Education (CBSE) in India.

The purpose of CTET is to determine a candidate's eligibility for appointment as a teacher for classes I to VIII in central government schools (like KVS, NVS), union territories, and schools that accept CTET scores.

UGC-NET and CSIR-NET are for determining eligibility for college/university lectureship and for Junior Research Fellowships.

NTA is the National Testing Agency that conducts various exams, but CTET is the specific exam for school teacher eligibility.

Quick Tip

Remember the hierarchy: CTET/TETs are for school teachers (Classes 1-8/12), while NET/SET is for college and university lecturers.

---

122. The Bhoodan Movement (Land Gift Movement) is associated with
(A) Vinoba Bhave
(B) Mahatma Gandhi
(C) Jaya Prakash Narayan
(D) Karpuri Thakur

Correct Answer: (A) Vinoba Bhave

Solution:
The Bhoodan Movement was a voluntary land reform movement in India.

It was started in 1951 by Acharya Vinoba Bhave, a prominent disciple of Mahatma Gandhi.

The movement's mission was to persuade wealthy landowners to voluntarily donate a percentage of their land to landless people.

The movement began in the village of Pochampally in Telangana.

Therefore, the Bhoodan Movement is directly associated with Vinoba Bhave.

Quick Tip

Associate major social movements with their leaders: Bhoodan Movement (Vinoba Bhave), Chipko Movement (Sunderlal Bahuguna), and Narmada Bachao Andolan (Medha Patkar).

---

123. International Literacy Day is observed on
(A) 15th September
(B) 8th November
(C) 8th September
(D) 11th November
Correct Answer: (C) 8th September

Solution:
International Literacy Day is a global observance declared by UNESCO.

It was first proclaimed in 1966.

The purpose of the day is to highlight the importance of literacy as a matter of dignity and human rights.

It is celebrated annually around the world on September 8th.

Quick Tip

Memorize key international days related to education: September 8 (International Literacy Day), October 5 (World Teachers' Day), and November 11 (National Education Day in India).

---

124. Sarva Shiksha Abhiyan (SSA) scheme focuses on
(A) Pre-primary Education.
(B) Elementary Education.
(C) Secondary Education.
(D) Senior Secondary Education.
Correct Answer: (B) Elementary Education.

Solution:
Sarva Shiksha Abhiyan (SSA) was a flagship programme of the Government of India launched in 2001.

Its primary goal was the Universalization of Elementary Education (UEE).

Elementary Education in the Indian context covers the age group of 6 to 14 years, which corresponds to Classes I to VIII.

The scheme aimed to provide useful and relevant elementary education for all children in this age group.

The SSA has now been subsumed under the new integrated scheme for school education called Samagra Shiksha Abhiyan.

Quick Tip

Remember the focus of major Indian education schemes: Sarva Shiksha Abhiyan (SSA) for Elementary Education, Rashtriya Madhyamik Shiksha Abhiyan (RMSA) for Secondary Education. Both are now part of Samagra Shiksha.

---

125. Epistemology as a branch of Philosophy deals with
(A) Values
(B) Morals
(C) Society
(D) Knowledge
Correct Answer: (D) Knowledge

Solution:
Philosophy is broadly divided into several main branches.

Epistemology is the branch of philosophy concerned with the theory of knowledge.

It investigates the origin, nature, methods, and limits of human knowledge.

It seeks to answer questions like What is knowledge?, How is knowledge acquired?, and What do people know?.

Axiology is the branch that deals with values (A). Ethics is the branch that deals with morals (B). Social philosophy deals with society (C).

Quick Tip

Remember the three main branches of philosophy: Metaphysics (study of reality), Epistemology (study of knowledge), and Axiology (study of values, which includes Ethics and Aesthetics).

---

126. The National Education Policy (NEP) 2020 envisions an education system rooted in
(A) Indian Ethos
(B) Indian Puranas
(C) Indian Itihasas
(D) Indian Polity
Correct Answer: (A) Indian Ethos

Solution:
A fundamental principle of the National Education Policy (NEP) 2020 is to create an education system that is rooted in Indian ethos.

This means the system should contribute to transforming India into a vibrant knowledge society by instilling a deep-rooted pride in being Indian, not only in thought, but also in spirit, intellect, and deeds.

The term Indian Ethos is a broad concept that encompasses the values, traditions, and cultural heritage of India.

While Puranas and Itihasas are part of this ethos, Indian Ethos is the most comprehensive and accurate term used in the policy document.

Quick Tip

NEP 2020 has several key principles. One of the most important is creating an education system that is modern and forward-looking but also deeply rooted in Indian ethos and values.

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127. PARAKH is an initiative by which national academic body?
(A) UGC
(B) NCERT
(C) CBSE
(D) NIOS
Correct Answer: (B) NCERT

Solution:
PARAKH is an acronym for Performance Assessment, Review, and Analysis of Knowledge for Holistic Development.

It is a national assessment centre proposed by the National Education Policy (NEP) 2020.

The primary objective of PARAKH is to set norms, standards, and guidelines for student assessment and evaluation for all recognized school boards of India.

PARAKH has been set up as a constituent unit of the National Council of Educational Research and Training (NCERT).

Therefore, it is an initiative by NCERT.

Quick Tip

PARAKH is a key initiative under NEP 2020. Remember its full form and that it functions under NCERT to standardize assessment across different school boards in India.

---

128. National Institute of Open Schooling (NIOS) is primarily serving the educational needs of the children
(A) who are informal schooling.
(B) who are outside the school.
(C) with disabilities.
(D) from deprived sections.
Correct Answer: (B) who are outside the school.

Solution:
The National Institute of Open Schooling (NIOS) is a national board for education in India under the Government of India.

It provides a flexible open and distance learning (ODL) system to provide education to a diverse group of learners who cannot attend regular, formal schools.

This broad category of who are outside the school includes school dropouts, learners from remote areas, working adults, and others who need a more flexible pathway to complete their education.

While NIOS also serves children with disabilities (C) and from deprived sections (D), the most comprehensive and primary group it serves is anyone who is outside the formal schooling system for any reason.

Quick Tip

Think of NIOS as the school for everyone else - its main purpose is to provide educational access to learners who are not part of the conventional, formal school system.

---

129. The Annual Status of Education Report (ASER) for India 2023 was released by
(A) NALSAR Foundation
(B) Cry Foundation
(C) Pratham Foundation
(D) Pehal Foundation
Correct Answer: (C) Pratham Foundation

Solution:
The Annual Status of Education Report (ASER) is a large-scale, annual, citizen-led household survey.

It is designed to assess the foundational reading and arithmetic skills of children in rural India.

This influential report, which provides critical insights into the learning levels in the country, is published by the Pratham Foundation.

Pratham is a non-governmental organization (NGO) working to provide quality education to underprivileged children in India.

The ASER report is one of its most well-known initiatives.

Quick Tip

Associate the ASER report directly with the NGO Pratham. This is a very common question in exams related to education and social issues in India.

---

130. Four Pillars of education was articulated by
(A) Indian Education Commission.
(B) American Education Commission.
(C) British Education Commission.
(D) UNESCO Education Commission.
Correct Answer: (D) UNESCO Education Commission.

Solution:
The concept of the Four Pillars of Education was presented in the report Learning: The Treasure Within.

This report was submitted to UNESCO (United Nations Educational, Scientific and Cultural Organization) in 1996.

The report was prepared by the International Commission on Education for the Twenty-first Century, which was chaired by Jacques Delors. This is often referred to as the Delors Commission.

The four pillars are:
1. Learning to know
2. Learning to do
3. Learning to live together
4. Learning to be

Since the report was commissioned by and submitted to UNESCO, it is an articulation by a UNESCO Education Commission.

Quick Tip

Remember the Four Pillars of Education from the Delors Report for UNESCO: Learning to know, to do, to live together, and to be. This is a foundational concept in international education philosophy.

---

12 Computer Awareness

131. Which of the following is not an operating system?
(A) Mozilla
(B) Android
(C) Solaris
(D) Windows
Correct Answer: (A) Mozilla

Solution:
An operating system (OS) is system software that manages computer hardware and software resources and provides common services for computer programs.

Let's analyze the options:

(B) Android: This is a mobile operating system based on a modified version of the Linux kernel, developed by Google.

(C) Solaris: This is a Unix-based operating system originally developed by Sun Microsystems.

(D) Windows: This is a family of proprietary operating systems developed and marketed by Microsoft.

(A) Mozilla: This is not an operating system. The Mozilla Foundation is a non-profit organization that develops free software, most notably the Mozilla Firefox web browser.

Therefore, Mozilla is not an operating system.

Quick Tip

Be able to distinguish between different types of software. An operating system (like Windows, macOS, Linux, Android) is the fundamental software that runs a computer, while an application (like Firefox, MS Word, Photoshop) is a program that runs on the OS to perform a specific task.

---

132. Operating systems manage computer resources and provide a platform to run software. Which type of operating system allows more than one user to access the computer resources at the same time.
(A) Single-user
(B) Real-time
(C) Multi-user
(D) Mobile
Correct Answer: (C) Multi-user

Solution:
Operating systems can be classified based on the number of users they can support simultaneously.

(A) Single-user OS: Allows only one user to operate the computer at a time (e.g., MS-DOS, older versions of Windows).

(C) Multi-user OS: Allows multiple users to access the computer's resources (CPU, memory, storage) at the same time, often through different terminals or network connections. Examples include Unix, Linux, and modern server versions of Windows.

(B) Real-time OS: Designed to process data as it comes in, typically without buffer delays. Used in systems where timing is critical (e.g., industrial control systems).

(D) Mobile OS: Designed specifically for mobile devices like smartphones and tablets (e.g., Android, iOS).

The question asks for the type that allows more than one user to access resources simultaneously, which is the definition of a multi-user operating system.

Quick Tip

Remember the key classifications of operating systems: by user (single-user, multi-user), by task (single-tasking, multi-tasking), and by application (e.g., real-time, mobile).

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133. .txt file belongs to _____
(A) MS-WORD
(B) MS-ACCESS
(C) NOTEPAD
(D) MS-EXCEL
Correct Answer: (C) NOTEPAD

Solution:
File extensions indicate the type of file and the program that can typically open it.

The .txt extension stands for text. It denotes a plain text file, which contains only unformatted text characters.

Let's look at the applications and their default file extensions:

(A) MS-WORD: Primarily uses .doc or .docx for formatted documents.

(B) MS-ACCESS: Uses .accdb for database files.

(C) NOTEPAD: This is the default plain text editor in Windows. It creates and saves files with the .txt extension.

(D) MS-EXCEL: Uses .xls or .xlsx for spreadsheet files.

Therefore, a .txt file belongs to Notepad.

Quick Tip

Associate common file extensions with their respective Microsoft Office applications: .docx (Word), .xlsx (Excel), .pptx (PowerPoint), .accdb (Access). For simple, unformatted text, the standard is .txt (Notepad).

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134. A set of one or more attributes that can uniquely identify a record in a database is called
(A) Super key
(B) Candidate key
(C) Alternate key
(D) Primary key
Correct Answer: (A) Super key

Solution:
In database terminology, keys are used to uniquely identify records (rows) in a table. Let's define the keys in the options.

(A) Super Key: A super key is any set of one or more attributes that, taken collectively, can uniquely identify a record in a table. It is the broadest definition of a key that ensures uniqueness.

(B) Candidate Key: A candidate key is a minimal super key. This means it's a super key from which no attribute can be removed without losing the uniqueness property. A table can have multiple candidate keys.

(D) Primary Key: The primary key is one of the candidate keys that is chosen by the database designer to be the main identifier for the table. It cannot contain null values.

(C) Alternate Key: Any candidate key that is not chosen to be the primary key is called an alternate key.

The question asks for A set of one or more attributes that can uniquely identify a record, which is the exact definition of a Super Key. While Candidate and Primary keys also do this, Super Key is the most general and correct term for any such set.

Quick Tip

Think of the relationship between keys as nested sets: Super Keys are the largest set. Candidate Keys are a subset of Super Keys (the minimal ones). The Primary Key is a single key chosen from the set of Candidate Keys.

---

135. Which of the following is a low-level language?
(A) Java
(B) Python
(C) Assembly
(D) SQL
Correct Answer: (C) Assembly

Solution:
Programming languages are categorized as either low-level or high-level.

High-level languages (like Java, Python) are programmer-friendly, use English-like syntax, and are abstracted from the computer's hardware architecture. SQL is a high-level query language for databases.

Low-level languages provide little or no abstraction from the computer's instruction set architecture. They are closer to the hardware.

There are two main types of low-level languages:
1. Machine Language: Binary code (0s and 1s) that the CPU can execute directly.
2. Assembly Language: Uses mnemonics (short, English-like words) to represent machine code instructions. It has a one-to-one correspondence with machine language but is slightly more human-readable.

From the options, Assembly language is the only low-level language.

Quick Tip

Remember the hierarchy of programming languages: High-level languages (e.g., Python, Java) are closest to human language. They are compiled or interpreted into low-level languages (Assembly language), which are then assembled into machine code (binary) that the computer's processor can execute.

136. While working in MS-Word, which feature helps a document with a different name or location, allowing users to preserve the original file while creating a new copy?
(A) Print preview
(B) Save
(C) Save as
(D) Edit
Correct Answer: (C) Save as

Solution:
Let's understand the functions of the given commands in MS-Word.

(B) Save: The 'Save' command updates the existing file with the latest changes. If the file is new, it will open the 'Save As' dialog box. On an existing file, it overwrites the original.

(C) Save As: The 'Save As' command is used to save a copy of the current document. It opens a dialog box that allows you to specify a new file name, file type, or location for the new copy. The original file remains untouched in its original location.

(A) Print preview shows how the document will look when printed.

(D) Edit refers to the general process of making changes to the document.

The feature that allows preserving the original file while creating a new copy with a different name or location is 'Save As'.

Quick Tip

Remember the key difference: 'Save' updates the current file. 'Save As' creates a new file (a copy), leaving the original unchanged. Use 'Save As' when you want to create a new version of a document.

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137. In MS-Excel, users work with a grid of cells. Each cell is identified by a combination of row numbers and column letters. What is the reference for a cell in column A and row 4?
(A) 4A
(B) A4
(C) AA
(D) 44
Correct Answer: (B) A4

Solution:
In Microsoft Excel, a worksheet is organized into a grid of columns and rows.

Columns are identified by letters (A, B, C, ... AA, AB, ...).

Rows are identified by numbers (1, 2, 3, ...).

The address or reference of a specific cell is determined by combining its column letter and row number.

The standard convention for a cell reference is to write the column letter first, followed by the row number.

For a cell located in column A and row 4, the correct reference is A4.

Quick Tip

The cell referencing system in Excel is always Column first, then Row. So it's A4, B12, C36, etc. Never the number first.

---

138. Which of the following formats, data is stored in relational database management system?
(A) Graph
(B) Table
(C) Binary
(D) Object
Correct Answer: (B) Table

Solution:
A Relational Database Management System (RDBMS) is based on the relational model, which was proposed by E. F. Codd.

The fundamental principle of the relational model is that all data is stored and represented in two-dimensional structures called relations.

In common parlance, these relations are known as tables.

Each table consists of rows (also called tuples or records) and columns (also called attributes or fields).

While data is ultimately stored in binary format on the disk, the logical structure and format in an RDBMS is the table.

Graph databases store data in graphs, and Object databases store data as objects.

Quick Tip

Remember the keyword: Relational Database = Relations = Tables. All data in an RDBMS is logically organized into tables with rows and columns.

---

139. What is an Excel feature that displays only the data in column(s) according to specified criteria?
(A) Filtering
(B) Sorting
(C) Formula
(D) Pivot
Correct Answer: (A) Filtering

Solution:
Let's define the Excel features mentioned:

(A) Filtering: This feature allows you to temporarily hide rows that you don't want to see and display only the rows that meet a specific criteria you define. This exactly matches the description in the question.

(B) Sorting: This feature arranges the data in a range or table in a specific order (e.g., alphabetically A-Z, or numerically from smallest to largest). It reorders the data but does not hide any of it.

(C) Formula: A formula is an expression that calculates the value of a cell (e.g., =SUM(A1:A5)).

(D) Pivot Table: A Pivot Table is an advanced tool used to summarize, analyze, and explore large amounts of data.

The feature that displays only the data meeting a specified criteria is Filtering.

Quick Tip

Remember the difference: Sorting rearranges all your data. Filtering hides the data you don't want to see based on your criteria.

---

140. The full form of 'GPS' is _____
(A) Graphical Placing System

(B) Global Positioning System
(C) Global Placing System
(D) Graphical Programing system
Correct Answer: (B) Global Positioning System

Solution:
GPS is a widely used satellite-based navigation system.

It consists of a constellation of satellites orbiting the Earth that transmit signals.

GPS receivers on the ground use these signals to calculate their precise location (latitude, longitude, and altitude) anywhere on the planet.

The full form of the acronym 'GPS' is Global Positioning System.

Quick Tip

Memorize the full forms of common technology acronyms: GPS (Global Positioning System), URL (Uniform Resource Locator), HTML (HyperText Markup Language), and CPU (Central Processing Unit).

---

141. _____ is not a function in MS-Excel.
(A) AVERAGE
(B) SUBTRACT
(C) COUNT
(D) MAX
Correct Answer: (B) SUBTRACT

Solution:
Let's examine the options in the context of MS-Excel functions.

(A) AVERAGE: The AVERAGE() function is a standard Excel function that calculates the arithmetic mean of a range of numbers. For example, =AVERAGE(A1:A5).

(C) COUNT: The COUNT() function is a standard Excel function that counts the number of cells in a range that contain numbers. For example, =COUNT(A1:A5).

(D) MAX: The MAX() function is a standard Excel function that returns the largest value in a set of values. For example, =MAX(A1:A5).

(B) SUBTRACT: There is no built-in function called SUBTRACT() in Excel. To perform subtraction, you use the minus (-) arithmetic operator directly in a formula. For example, =A1-B1.

Therefore, SUBTRACT is not a function in MS-Excel.

Quick Tip

Remember that basic arithmetic operations (addition, subtraction, multiplication, division) in Excel are performed using operators (+, -, , /) in formulas, not with named functions like SUM() for addition.

---

142. In a power point presentation
(A) Sound clips can be inserted but not movie clips.
(B) Movie clips can be inserted but not sound clips.
(C) Sound and movie clips cannot be inserted.
(D) Movie clips and sound clips can be inserted.
Correct Answer: (D) Movie clips and sound clips can be inserted.

Solution:
Microsoft PowerPoint is a multimedia presentation software.

One of its key features is the ability to embed various types of media to make presentations more engaging and dynamic.

This includes the ability to insert both audio files (sound clips, music, narration) and video files (movie clips).

The Insert tab in PowerPoint has options for both Video and Audio.

Therefore, both movie clips and sound clips can be inserted into a PowerPoint presentation.

Quick Tip

Modern presentation software like PowerPoint is designed to be a rich multimedia tool. Assume that it can handle all common media types: text, images, audio, video, and animations.

---

143. Which of the following font effect is not available in MS-PPT font dialogue box?
(A) Underline

(B) Strikethrough
(C) Shadow
(D) Emboss
Correct Answer: (D) Emboss

Solution:
The Font dialog box in Microsoft PowerPoint provides a variety of text formatting options.

Let's check the availability of the effects listed:

(A) Underline: This is a standard font effect available in PowerPoint, allowing you to place a line under the text.

(B) Strikethrough: This is a standard effect that draws a line through the middle of the text. It is available in the Font dialog box.

(C) Shadow: This effect adds a shadow behind the text, giving it a 3D appearance. It is available in the Font dialog box.

(D) Emboss: This effect makes the text appear as if it is raised from the surface. While some older versions or different software might have had this, in modern versions of PowerPoint, this specific Emboss effect is not a standard option in the main Font dialog box. Similar effects can be achieved through Text Effects in the Format Shape pane, but it's not a direct checkbox option like the others.

Therefore, Emboss is the effect not readily available in the standard font dialog box.

Quick Tip

Familiarize yourself with the standard options in the Font dialog box of MS Office applications: Bold, Italic, Underline, Strikethrough, Subscript, Superscript, and Shadow are common across Word, Excel, and PowerPoint.

---

144. Sorting emails by date will arrange emails
(A) Alphabetically
(B) By the sender's name
(C) Based on received or sent time
(D) Based on subject line
Correct Answer: (C) Based on received or sent time

Solution:
Sorting is the process of arranging items in a specific order.

In an email client, you can sort your emails based on various criteria like sender, subject, size, or date.

When you sort emails by date, the email client uses the timestamp associated with each email to arrange them.

This timestamp indicates the exact time the email was received (in the inbox) or sent (in the sent items folder).

The arrangement will be chronological, either from newest to oldest or oldest to newest.

Therefore, sorting by date arranges emails based on their received or sent time.

Quick Tip

Think logically about what each sorting option means: sorting by Sender uses the alphabet, sorting by Subject uses the alphabet, and sorting by Date uses time (chronological order).

---

145. In computer, which virus spreads without user intervention?
(A) Trojan
(B) Worm
(C) Spyware
(D) Ransomware
Correct Answer: (B) Worm

Solution:
Malware can be categorized by how it spreads and its function.

(A) Trojan (or Trojan Horse): This is malware disguised as legitimate software. It requires the user to execute it, thinking it's something harmless. It does not self-replicate.

(B) Worm: A worm is a standalone malware computer program that replicates itself in order to spread to other computers. It often uses a computer network to spread itself, relying on security vulnerabilities on the target computer to gain access. A key characteristic of a worm is that it can spread automatically without any user intervention.

(C) Spyware: Malware that secretly observes the user's activities on the computer and sends that information to others. It needs to be installed first, often through a Trojan.

(D) Ransomware: Malware that encrypts the user's files and demands a ransom payment to decrypt them. It also requires an initial infection vector.

The type of malware that spreads by itself without user action is a worm.

Quick Tip

Remember the key difference in spreading mechanisms: a Virus attaches to a program and needs a user to run it. A Trojan tricks a user into running it. A Worm spreads by itself across a network.

---

146. Which of the following is not related to Internet?
(A) URL
(B) HTTP
(C) OMR
(D) COOKIE
Correct Answer: (C) OMR

Solution:
Let's define each term to see its relation to the Internet.

(A) URL (Uniform Resource Locator): This is the address of a resource on the World Wide Web (e.g., https://www.google.com). It is fundamental to the Internet.

(B) HTTP (Hypertext Transfer Protocol): This is the protocol used to transfer data over the web. It is the foundation of data communication for the World Wide Web.

(D) Cookie: A cookie is a small piece of data sent from a website and stored on the user's computer by the web browser. It is used to remember stateful information. It is directly related to internet browsing.

(C) OMR (Optical Mark Recognition): This is the process of capturing human-marked data from document forms such as surveys and tests (like the answer sheets for multiple-choice exams). It is an input technology and is not inherently related to the Internet.

Therefore, OMR is not related to the Internet.

Quick Tip

Be familiar with common acronyms. Internet-related ones often involve protocols (HTTP, FTP), locators (URL), and languages (HTML). OMR is related to physical document scanning and data entry.

147. Which programming language is most commonly used in AI and ML?
(A) HTML
(B) Python
(C) CSS
(D) JavaScript
Correct Answer: (B) Python

Solution:
Let's analyze the languages and their common uses.

(A) HTML (HyperText Markup Language): The standard markup language for creating web pages. It is not a programming language for AI/ML.

(C) CSS (Cascading Style Sheets): A style sheet language used for describing the presentation of a document written in a markup language like HTML. Not used for AI/ML.

(D) JavaScript: A high-level programming language that is one of the core technologies of the World Wide Web, used for making web pages interactive. While there are some ML libraries for it, it is not the most common choice.

(B) Python: This high-level, general-purpose programming language has become the de facto standard for Artificial Intelligence (AI) and Machine Learning (ML). This is due to its simple syntax, extensive libraries (like TensorFlow, PyTorch, scikit-learn), and strong community support.

Therefore, Python is the most commonly used language for AI and ML.

Quick Tip

Associate programming languages with their primary domains: Web Frontend (HTML, CSS, JavaScript), AI/ML and Data Science (Python, R), Mobile Apps (Java/Kotlin for Android, Swift for iOS).

---

148. _____ is a branch of science that deals with programming the systems in such way that they automatically learn and improve with experience.
(A) Machine learning
(B) Cloud computing
(C) Neural network
(D) Internet of things
Correct Answer: (A) Machine learning

Solution:
The question asks for the branch of science that enables systems to learn from experience.

(A) Machine Learning (ML): This is the field of study that gives computers the ability to learn without being explicitly programmed. ML algorithms build a model based on sample data, known as training data, in order to make predictions or decisions. This perfectly matches the description.

(B) Cloud computing: This is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user.

(C) Neural network: This is a specific type of model used within machine learning, inspired by the human brain. It's a tool for machine learning, not the entire branch of science.

(D) Internet of Things (IoT): This is the network of physical objects embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data.

The correct term for the entire field is Machine Learning.

Quick Tip

Understand the hierarchy: Artificial Intelligence (AI) is the broad field of making machines smart. Machine Learning (ML) is a subfield of AI that focuses on learning from data. Deep Learning (using Neural Networks) is a subfield of ML.

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149. Which software application design simulates human communication through text or voice?
(A) Zoom
(B) Chatbot
(C) Webex
(D) Teams
Correct Answer: (B) Chatbot

Solution:
The question asks for a software application that simulates human communication.

(A) Zoom, (C) Webex, and (D) Teams are all collaboration platforms that facilitate actual communication between humans through video conferencing, chat, and calls. They don't simulate a person.

(B) Chatbot: A chatbot is a computer program designed to simulate conversation with human users, especially over the Internet. It uses natural language processing (NLP) to understand

user queries (text or voice) and provide automated responses.

Therefore, a chatbot is the application that simulates human communication.

Quick Tip

Differentiate between tools that facilitate communication (like Zoom, Teams) and tools that simulate communication (like Chatbots, Virtual Assistants). The key is whether the software is pretending to be a conversational partner.

---

150. What is the purpose of a web browser's refresh or reload button?
(A) Close the current tab.
(B) To open new tab.
(C) To return to previous web page.
(D) To reload the current web page.
Correct Answer: (D) To reload the current web page.

Solution:
Let's analyze the functions of common browser buttons.

(A) Closing the current tab is usually done by clicking an 'x' on the tab itself.

(B) Opening a new tab is done by clicking a '+' icon or using a keyboard shortcut (Ctrl+T).

(C) Returning to the previous web page is the function of the 'Back' button (usually a left-pointing arrow).

(D) The refresh or reload button (usually a circular arrow) instructs the browser to download the current web page again from the server. This is useful if the page did not load correctly or to see the latest updated content.

Therefore, the purpose of the refresh/reload button is to reload the current web page.

Quick Tip

Familiarize yourself with the standard icons and functions of a web browser: Back arrow (previous page), Forward arrow (next page), Circular arrow (refresh/reload), and '+' (new tab).
