

IPU CET 2025 Question Paper with Solutions

Time Allowed :3 Hours	Maximum Marks :240	Total Questions :60
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General Instructions

1. The examination is of 2 hours 30 minutes duration.
2. The question paper consists of multiple-choice questions (MCQs).
3. The question paper is divided into four sections as per the syllabus prescribed for the respective course.
4. The total number of questions in the paper is 100.
5. Each question carries 4 marks for the correct answer.
6. One mark will be deducted for each incorrect answer.
7. The examination is conducted in English language only.
8. All questions are compulsory.
9. The maximum marks for the examination are 400.
10. Use of calculators, mobile phones, smart watches, or any other electronic devices is strictly prohibited.
11. Only one option is correct for each question. Choose the most appropriate option.
12. Answers must be marked on the OMR sheet only.
13. Use of black or blue ballpoint pen is allowed for marking answers.
14. Any kind of rough work must be done in the space provided in the question booklet.
15. Candidates must ensure that the OMR sheet is properly filled before submission.
16. In case of any discrepancy or emergency, immediately report to the invigilator

1. If A is a square matrix of order 3 such that the determinant $|A| = 5$, what is the value of the determinant $|2A|$?

- (A) 10
- (B) 25
- (C) 40
- (D) 8

Correct Answer: (C) 40

Solution:

Step 1: Understanding the Concept:

This question is based on the properties of determinants of square matrices under scalar multiplication.

The determinant is an n -linear function, meaning if you multiply a matrix of order n by a scalar k , the scalar is factored out of each of the n rows.

Step 2: Key Formula or Approach:

For a square matrix A of order n and a scalar k , the property is:

$$|kA| = k^n |A|$$

In this problem, we are given $n = 3$, $k = 2$, and $|A| = 5$.

Step 3: Detailed Explanation:

Given the order of matrix A is $n = 3$.

Given the determinant $|A| = 5$.

We need to find $|2A|$.

Using the formula $|kA| = k^n |A|$:

$$|2A| = 2^3 \times |A|$$

$$|2A| = 8 \times 5$$

$$|2A| = 40$$

Step 4: Final Answer:

The value of the determinant $|2A|$ is 40.

 Quick Tip

To avoid confusion, remember that the scalar multiplier k is raised to the power of the matrix's dimension n . If the matrix is 2×2 , it would be k^2 ; for 3×3 , it is k^3 .

2. The value of the limit as x approaches 0 for $\frac{\sin(5x)}{x}$ is

- (A) 1
- (B) 5
- (C) $\frac{1}{5}$
- (D) 0

Correct Answer: (B) 5

Solution:

Step 1: Understanding the Concept:

The problem asks for the limit of a trigonometric function as the variable approaches zero.

When direct substitution results in an indeterminate form like $\frac{0}{0}$, we apply standard limits or L'Hôpital's Rule.

Step 2: Key Formula or Approach:

Method 1: Standard Limit Rule: $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$.

Method 2: L'Hôpital's Rule: $\lim_{x \rightarrow a} \frac{f(x)}{g(x)} = \lim_{x \rightarrow a} \frac{f'(x)}{g'(x)}$ if the limit is $\frac{0}{0}$.

Step 3: Detailed Explanation:

Let's evaluate using the standard limit form:

$$\lim_{x \rightarrow 0} \frac{\sin(5x)}{x}$$

To match the argument of the sine function ($5x$) with the denominator, we multiply and divide by 5:

$$= \lim_{x \rightarrow 0} \left(5 \cdot \frac{\sin(5x)}{5x} \right)$$

As $x \rightarrow 0$, $5x$ also approaches 0.

$$\begin{aligned} &= 5 \cdot \left(\lim_{5x \rightarrow 0} \frac{\sin(5x)}{5x} \right) \\ &= 5 \cdot 1 = 5 \end{aligned}$$

Step 4: Final Answer:

The value of the limit is 5.

💡 Quick Tip

For any limit of the form $\lim_{x \rightarrow 0} \frac{\sin(ax)}{bx}$, the answer is always the ratio of the coefficients, $\frac{a}{b}$. In this case, $\frac{5}{1} = 5$.

3. If vector $\vec{a} = 2\hat{i} + m\hat{j} + \hat{k}$ and vector $\vec{b} = \hat{i} - 2\hat{j} + 3\hat{k}$ are perpendicular to each other, then the value of m is

- (A) 2.5
- (B) 3
- (C) 5
- (D) -2

Correct Answer: (A) 2.5

Solution:

Step 1: Understanding the Concept:

Two non-zero vectors are perpendicular (orthogonal) if and only if their dot product (scalar product) is zero.

Step 2: Key Formula or Approach:

For vectors $\vec{u} = a_1\hat{i} + a_2\hat{j} + a_3\hat{k}$ and $\vec{v} = b_1\hat{i} + b_2\hat{j} + b_3\hat{k}$, the dot product is:

$$\vec{u} \cdot \vec{v} = a_1b_1 + a_2b_2 + a_3b_3$$

If $\vec{u} \perp \vec{v}$, then $\vec{u} \cdot \vec{v} = 0$.

Step 3: Detailed Explanation:

Given:

$$\vec{a} = 2\hat{i} + m\hat{j} + 1\hat{k}$$

$$\vec{b} = 1\hat{i} - 2\hat{j} + 3\hat{k}$$

Since $\vec{a} \perp \vec{b}$, we have $\vec{a} \cdot \vec{b} = 0$.

$$(2)(1) + (m)(-2) + (1)(3) = 0$$

$$2 - 2m + 3 = 0$$

$$5 - 2m = 0$$

$$2m = 5$$

$$m = 2.5$$

Step 4: Final Answer:

The value of m is 2.5.

💡 Quick Tip

Always double-check the signs of the components when calculating the dot product. A small sign error ($-2m$ vs $+2m$) is the most common mistake in vector questions.

4. Two dice are tossed. The probability that the total score is a prime number is

- (A) $\frac{1}{6}$
- (B) $\frac{5}{12}$
- (C) $\frac{1}{2}$
- (D) $\frac{7}{9}$

Correct Answer: (B) $\frac{5}{12}$

Solution:

Step 1: Understanding the Concept:

This is a probability problem involving the sum of outcomes from two dice.

The total possible outcomes when two dice are tossed is $6 \times 6 = 36$.

Step 2: Key Formula or Approach:

Probability $P(E) = \frac{n(E)}{n(S)}$, where $n(E)$ is the number of favorable outcomes and $n(S)$ is the

total sample space.

Prime numbers between the minimum possible sum (2) and maximum possible sum (12) are: 2, 3, 5, 7, 11.

Step 3: Detailed Explanation:

Let's count the pairs for each prime sum:

- Sum 2: (1,1) $\rightarrow$ 1 outcome.
- Sum 3: (1,2), (2,1) $\rightarrow$ 2 outcomes.
- Sum 5: (1,4), (4,1), (2,3), (3,2) $\rightarrow$ 4 outcomes.
- Sum 7: (1,6), (6,1), (2,5), (5,2), (3,4), (4,3) $\rightarrow$ 6 outcomes.
- Sum 11: (5,6), (6,5) $\rightarrow$ 2 outcomes.

Total favorable outcomes $n(E) = 1 + 2 + 4 + 6 + 2 = 15$.

Total sample space $n(S) = 36$.

$$P(\text{Prime Sum}) = \frac{15}{36}$$

Dividing both by 3:

$$P = \frac{5}{12}$$

Step 4: Final Answer:

The probability is $\frac{5}{12}$.

💡 Quick Tip

The number of ways to get a sum S with two dice can be found quickly:

For $S \leq 7$, ways = $S - 1$.

For $S > 7$, ways = $13 - S$.

5. The derivative of $e^{2x} \sin x$ with respect to x is

- (A) $e^{2x}(\cos x + 2 \sin x)$
- (B) $e^{2x}(\sin x + \cos x)$
- (C) $2e^{2x} \cos x$
- (D) $e^x \sin(2x)$

Correct Answer: (A) $e^{2x}(\cos x + 2 \sin x)$

Solution:

Step 1: Understanding the Concept:

We need to differentiate a product of two functions of x : an exponential function and a trigonometric function.

Step 2: Key Formula or Approach:

Use the Product Rule: $\frac{d}{dx}(uv) = u\frac{dv}{dx} + v\frac{du}{dx}$.

Also use the Chain Rule: $\frac{d}{dx}(e^{ax}) = ae^{ax}$.

Step 3: Detailed Explanation:

Let $u = e^{2x}$ and $v = \sin x$.

$$\frac{du}{dx} = 2e^{2x}$$

$$\frac{dv}{dx} = \cos x$$

Applying the product rule:

$$\frac{d}{dx}(e^{2x} \sin x) = (e^{2x})(\cos x) + (\sin x)(2e^{2x})$$

Taking e^{2x} common:

$$= e^{2x}(\cos x + 2 \sin x)$$

Step 4: Final Answer:

The derivative is $e^{2x}(\cos x + 2 \sin x)$.

💡 Quick Tip

For derivatives of the form $e^{ax}f(x)$, the result is always $e^{ax}[af(x) + f'(x)]$. This saves time during competitive exams.

6. If set A has 3 elements and set B has 4 elements, then the number of injective mappings from A to B is

- (A) 144
- (B) 12
- (C) 24
- (D) 64

Correct Answer: (C) 24

Solution:

Step 1: Understanding the Concept:

An injective mapping (or one-to-one function) means that each element in set A must be mapped to a unique and distinct element in set B.

Step 2: Key Formula or Approach:

If $n(A) = r$ and $n(B) = n$, the number of injective functions is ${}^nP_r = \frac{n!}{(n-r)!}$.

This is equivalent to choosing r elements from n and arranging them.

Step 3: Detailed Explanation:

Here, $n(A) = 3$ and $n(B) = 4$.

Number of injective mappings $= {}^4P_3$

$$= \frac{4!}{(4-3)!} = \frac{4 \times 3 \times 2 \times 1}{1} = 24$$

Logically: The first element of A has 4 choices in B. The second has 3 remaining choices. The third has 2 remaining choices.

Total $= 4 \times 3 \times 2 = 24$.

Step 4: Final Answer:

The number of injective mappings is 24.

💡 Quick Tip

If $n(A) > n(B)$, the number of injective mappings is always 0 because at least two elements in A would have to map to the same element in B (Pigeonhole Principle).

7. The value of $\tan 75^\circ - \cot 75^\circ$ is equal to

- (A) $2\sqrt{3}$
- (B) $2 + \sqrt{3}$
- (C) $2 - \sqrt{3}$
- (D) 1

Correct Answer: (A) $2\sqrt{3}$

Solution:

Step 1: Understanding the Concept:

We need to calculate the values of $\tan$ and $\cot$ for a non-standard angle (75°) using compound angle formulas.

Step 2: Key Formula or Approach:

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

We use $75^\circ = 45^\circ + 30^\circ$.

Step 3: Detailed Explanation:

$$\tan 75^\circ = \tan(45^\circ + 30^\circ) = \frac{1 + \frac{1}{\sqrt{3}}}{1 - 1 \cdot \frac{1}{\sqrt{3}}} = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$$

$$\text{Rationalizing: } \frac{(\sqrt{3} + 1)^2}{3 - 1} = \frac{4 + 2\sqrt{3}}{2} = 2 + \sqrt{3}.$$

$$\cot 75^\circ = \frac{1}{\tan 75^\circ} = \frac{1}{2+\sqrt{3}} = 2 - \sqrt{3}.$$

Calculating the difference:

$$\begin{aligned} & (2 + \sqrt{3}) - (2 - \sqrt{3}) \\ &= 2 + \sqrt{3} - 2 + \sqrt{3} \\ &= 2\sqrt{3} \end{aligned}$$

Step 4: Final Answer:

The final value is $2\sqrt{3}$.

 Quick Tip

Memorize standard values: $\tan 75^\circ = 2 + \sqrt{3}$ and $\tan 15^\circ = 2 - \sqrt{3}$. Since $\cot 75^\circ = \tan 15^\circ$, the problem becomes very simple.

8. What is the value of i^{99} (where i is the imaginary unit)?

- (A) 1
- (B) -1
- (C) i
- (D) $-i$

Correct Answer: (D) $-i$

Solution:

Step 1: Understanding the Concept:

Powers of i repeat in a cycle of 4: $i^1 = i, i^2 = -1, i^3 = -i, i^4 = 1$.

Step 2: Key Formula or Approach:

Divide the exponent n by 4. The value of i^n is equal to i^r , where r is the remainder.

Step 3: Detailed Explanation:

Given i^{99} .

Divide 99 by 4: $99 = 24 \times 4 + 3$.

The remainder is 3.

$$\begin{aligned} i^{99} &= (i^4)^{24} \cdot i^3 \\ &= (1)^{24} \cdot (-i) \\ &= -i \end{aligned}$$

Step 4: Final Answer:

The value is $-i$.

 Quick Tip

Check only the last two digits of the exponent for divisibility by 4. Here, 99 leaves remainder 3 when divided by 4, so the answer is $i^3 = -i$.

9. If the function $f(x) = x^3 - 3x^2 + 6$ is defined on the interval $[0, 4]$, the maximum value is

- (A) 6
- (B) 2
- (C) 22
- (D) 18

Correct Answer: (C) 22

Solution:

Step 1: Understanding the Concept:

To find the absolute maximum of a function on a closed interval, we check function values at critical points and boundary points.

Step 2: Key Formula or Approach:

Critical points occur where $f'(x) = 0$. Boundaries are $x = 0$ and $x = 4$.

Step 3: Detailed Explanation:

$$f(x) = x^3 - 3x^2 + 6$$

$$f'(x) = 3x^2 - 6x$$

$$\text{Set } f'(x) = 0 \implies 3x(x - 2) = 0 \implies x = 0, 2.$$

Check values:

$$f(0) = 0 - 0 + 6 = 6$$

$$f(2) = 2^3 - 3(2^2) + 6 = 8 - 12 + 6 = 2$$

$$f(4) = 4^3 - 3(4^2) + 6 = 64 - 48 + 6 = 22$$

The maximum value among 6, 2, and 22 is 22.

Step 4: Final Answer:

The maximum value is 22.

 Quick Tip

Always check the endpoints! Many students stop at critical points, missing that the function often increases rapidly towards the end of the interval.

10. The integration of $\log x$ with respect to x is

- (A) $\frac{1}{x} + C$
- (B) $x \log x - x + C$
- (C) $x \log x + x + C$
- (D) $\frac{\log x}{x} + C$

Correct Answer: (B) $x \log x - x + C$

Solution:

Step 1: Understanding the Concept:

The integral of $\log x$ is not a basic integral found in standard tables. It requires Integration by Parts.

Step 2: Key Formula or Approach:

Use $\int u dv = uv - \int v du$.

Let $u = \log x$ and $dv = dx$.

Step 3: Detailed Explanation:

$$u = \log x \implies du = \frac{1}{x} dx$$

$$dv = dx \implies v = x$$

$$\begin{aligned}\int \log x dx &= x \log x - \int x \cdot \frac{1}{x} dx \\ &= x \log x - \int 1 dx \\ &= x \log x - x + C\end{aligned}$$

Step 4: Final Answer:

The correct option is (B).

💡 Quick Tip

Integration by Parts is essential when you have only one function whose integral you don't know directly, like $\log x$ or $\sin^{-1} x$. Treat it as $\int 1 \cdot f(x) dx$.

11. In a Geometric Progression (G.P.), if the third term is 4, then the product of the first 5 terms is

- (A) 4^3
- (B) 4^4
- (C) 4^5
- (D) None of these

Correct Answer: (C) 4^5

Solution:

Step 1: Understanding the Concept:

In a G.P., terms are defined as $a, ar, ar^2, \dots$ where a is the first term and r is the common ratio.

Step 2: Key Formula or Approach:

The n -th term is $T_n = ar^{n-1}$.

The third term is $T_3 = ar^2 = 4$.

Step 3: Detailed Explanation:

The first five terms are a, ar, ar^2, ar^3, ar^4 .

Their product $P = (a)(ar)(ar^2)(ar^3)(ar^4)$.

$$P = a^5 r^{1+2+3+4} = a^5 r^{10}$$

$$P = (ar^2)^5$$

Since $ar^2 = 4$:

$$P = 4^5$$

Step 4: Final Answer:

The product of the first 5 terms is 4^5 .

 Quick Tip

In any G.P. with $2n-1$ terms, the product of all terms is always the middle term raised to the power of the total number of terms. Middle term is T_3 , power is 5. Result = $(T_3)^5$.

12. If A is a symmetric matrix, then the transpose of A' is equal to

- (A) $-A$
- (B) A
- (C) Identity Matrix
- (D) Null Matrix

Correct Answer: (B) A

Solution:

Step 1: Understanding the Concept:

A matrix A is symmetric if $A' = A$. The notation A' denotes the transpose of matrix A .

Step 2: Key Formula or Approach:

Property of transpose: $(A')' = A$. This holds for any matrix.

Step 3: Detailed Explanation:

The question asks for the transpose of A' , which is $(A')'$.

By matrix properties, the transpose of a transpose of any matrix results back in the original matrix.

Since A is symmetric, we also know $A' = A$.

Thus, $(A')' = A$.

Step 4: Final Answer:

The result is matrix A .

💡 Quick Tip

For symmetric matrices, $A = A' = A'' = A''' = \dots$. For skew-symmetric matrices, $A' = -A$ and $A'' = A$.

13. The slope of the tangent to the curve $y = 3x^4 - 4x$ at $x = 4$ is

- (A) 764
- (B) 768
- (C) 500
- (D) 256

Correct Answer: (A) 764

Solution:

Step 1: Understanding the Concept:

The slope of the tangent to a curve $y = f(x)$ at a given point is the value of the first derivative $\frac{dy}{dx}$ at that point.

Step 2: Key Formula or Approach:

1. Find $\frac{dy}{dx}$.
2. Substitute $x = 4$ into the derivative.

Step 3: Detailed Explanation:

$$y = 3x^4 - 4x$$

Differentiating with respect to x :

$$\frac{dy}{dx} = 12x^3 - 4$$

At $x = 4$:

$$\begin{aligned}\text{Slope} &= 12(4^3) - 4 \\ &= 12(64) - 4 \\ &= 768 - 4 = 764\end{aligned}$$

Step 4: Final Answer:

The slope is 764.

 Quick Tip

Always ensure you differentiate before substituting. Substituting $x = 4$ into the original equation gives the y -coordinate, not the slope.

14. From a pack of 52 cards, two cards are drawn at random. What is the probability that both are Kings?

- (A) $\frac{1}{15}$
- (B) $\frac{25}{57}$
- (C) $\frac{1}{221}$
- (D) $\frac{1}{13}$

Correct Answer: (C) $\frac{1}{221}$

Solution:

Step 1: Understanding the Concept:

This is a probability problem involving selection from a set without replacement.

Step 2: Key Formula or Approach:

The total number of Kings in a deck is 4. The total cards are 52.

We use combinations nC_r or conditional probability.

Step 3: Detailed Explanation:

Number of ways to draw 2 Kings $= {}^4C_2 = \frac{4 \times 3}{2} = 6$.

Total ways to draw 2 cards $= {}^{52}C_2 = \frac{52 \times 51}{2} = 1326$.

Probability $= \frac{6}{1326}$.

Simplifying: $\frac{1}{221}$.

Alternatively, using sequential probability:

$P(\text{First is King}) = \frac{4}{52} = \frac{1}{13}$.

$P(\text{Second is King given First was King}) = \frac{3}{51} = \frac{1}{17}$.

Total P $= \frac{1}{13} \times \frac{1}{17} = \frac{1}{221}$.

Step 4: Final Answer:

The probability is $\frac{1}{221}$.

💡 Quick Tip

Sequential multiplication is usually faster than combinations for simple "both are X" problems. Just remember to reduce the count for the second draw.

15. The number of ways in which the letters of the word "APPLE" can be arranged is

- (A) 120
- (B) 60
- (C) 24
- (D) 100

Correct Answer: (B) 60

Solution:

Step 1: Understanding the Concept:

This is a permutation problem with repeated items. When items are repeated, we must divide by the factorial of the frequency of those items.

Step 2: Key Formula or Approach:

Number of arrangements = $\frac{n!}{p!q!\dots}$, where n is the total number of items and p, q are frequencies of repeating items.

Step 3: Detailed Explanation:

Word: APPLE

Total letters $n = 5$.

Frequencies: A: 1, P: 2, L: 1, E: 1.

Arrangements = $\frac{5!}{2!}$.

$$= \frac{120}{2} = 60$$

Step 4: Final Answer:

The total number of ways is 60.

💡 Quick Tip

Always count the total letters first, then divide by factorials of frequencies of any letter that appears more than once.

16. The value of $\sin 20^\circ \times \sin 40^\circ \times \sin 60^\circ \times \sin 80^\circ$ is

- (A) $\frac{3}{16}$
(B) $\frac{1}{16}$
(C) $\frac{3}{32}$
(D) $\frac{3}{32}$

Correct Answer: (A) $\frac{3}{16}$

Solution:

Step 1: Understanding the Concept:

This is a product of sines involving angles in a specific geometric relationship.

Step 2: Key Formula or Approach:

Use the identity: $\sin \theta \sin(60^\circ - \theta) \sin(60^\circ + \theta) = \frac{1}{4} \sin 3\theta$.

Also, we know $\sin 60^\circ = \frac{\sqrt{3}}{2}$.

Step 3: Detailed Explanation:

Let $\theta = 20^\circ$.

Then $60^\circ - \theta = 40^\circ$ and $60^\circ + \theta = 80^\circ$.

The expression is $(\sin 20^\circ \sin 40^\circ \sin 80^\circ) \times \sin 60^\circ$.

Applying the identity:

$$\begin{aligned} & \left(\frac{1}{4} \sin(3 \times 20^\circ) \right) \times \sin 60^\circ \\ &= \left(\frac{1}{4} \sin 60^\circ \right) \times \sin 60^\circ \\ &= \frac{1}{4} \times \left(\frac{\sqrt{3}}{2} \right) \times \left(\frac{\sqrt{3}}{2} \right) \\ &= \frac{1}{4} \times \frac{3}{4} = \frac{3}{16} \end{aligned}$$

Step 4: Final Answer:

The value is $\frac{3}{16}$.

 Quick Tip

Identities like $\sin \theta \sin(60 \pm \theta)$ and $\cos \theta \cos(60 \pm \theta)$ are very common in engineering and science entrance exams. Memorize them to save several minutes of manual calculation.

17. The “brain” of the computer system is

- (A) RAM
- (B) Hard Disk
- (C) CPU
- (D) Motherboard

Correct Answer: (C) CPU

Solution:

Step 1: Understanding the Concept:

In computer architecture, components are often categorized by their function. The central unit that processes all instructions is likened to a brain.

Step 2: Key Formula or Approach:

CPU stands for Central Processing Unit. It carries out the instructions of a computer program by performing the basic arithmetic, logical, control, and input/output operations.

Step 3: Detailed Explanation:

RAM is temporary memory for data access.

Hard Disk is for long-term storage.

Motherboard is the circuit board that connects everything.

CPU is the component that actually "thinks" and executes code, hence it is known as the "brain".

Step 4: Final Answer:

The "brain" is the CPU.

 Quick Tip

The CPU contains the ALU (Arithmetic Logic Unit) and the CU (Control Unit), which are responsible for all computations.

18. Which of the following is considered volatile memory?

- (A) ROM
- (B) RAM
- (C) HDD
- (D) Flash Drive

Correct Answer: (B) RAM

Solution:

Step 1: Understanding the Concept:

Memory is classified as volatile or non-volatile. Volatile memory requires power to maintain

the stored information.

Step 2: Key Formula or Approach:

Volatile = Loses data when power is off.

Non-volatile = Retains data when power is off.

Step 3: Detailed Explanation:

RAM (Random Access Memory) is volatile; its contents are wiped when the computer restarts.

ROM, HDD, and Flash Drives are non-volatile and are used for permanent storage.

Step 4: Final Answer:

RAM is volatile memory.

 Quick Tip

Think of RAM as a "work table" – once you turn off the lights and leave, the table is cleared. Think of the HDD as a "filing cabinet" – items stay there.

19. IPv4 addresses are how many bits long?

- (A) 16 bits
- (B) 32 bits
- (C) 64 bits
- (D) 128 bits

Correct Answer: (B) 32 bits

Solution:

Step 1: Understanding the Concept:

IP (Internet Protocol) addresses are numerical labels assigned to each device connected to a computer network.

Step 2: Key Formula or Approach:

IPv4 (Version 4) uses 32-bit addresses, usually represented in dotted-decimal notation (e.g., 192.168.1.1).

Step 3: Detailed Explanation:

An IPv4 address consists of 4 octets (groups of 8 bits).

$4 \times 8 = 32$ bits.

IPv6, on the other hand, uses 128-bit addresses to provide a much larger address space.

Step 4: Final Answer:

IPv4 addresses are 32 bits long.

 Quick Tip

Always distinguish between IPv4 (32 bits) and IPv6 (128 bits). 32 bits allows for roughly 4.3 billion unique addresses.

20. The binary equivalent of the decimal number 10 is

- (A) 1010
- (B) 1001
- (C) 1110
- (D) 1100

Correct Answer: (A) 1010

Solution:

Step 1: Understanding the Concept:

Binary is a base-2 system using only 0 and 1. We convert decimal to binary by successive division by 2.

Step 2: Key Formula or Approach:

Successive Division:

$$10 / 2 = 5 \text{ rem } 0$$

$$5 / 2 = 2 \text{ rem } 1$$

$$2 / 2 = 1 \text{ rem } 0$$

$$1 / 2 = 0 \text{ rem } 1$$

Step 3: Detailed Explanation:

Read the remainders from bottom to top: 1, 0, 1, 0.

Alternatively, use place values: $2^3 = 8$, $2^2 = 4$, $2^1 = 2$, $2^0 = 1$.

To get 10, we need $8 + 2$.

So, bits for 8 and 2 are 1, others are 0: 1 0 1 0.

Step 4: Final Answer:

The binary equivalent is 1010.

 Quick Tip

Memorize the binary for numbers 0–15; it makes logic gate and computer awareness questions much faster. 10 is 'A' in Hex and 1010 in binary.

21. Which file extension is typically used for Python script files?

- (A) .py
- (B) .pt
- (C) .java
- (D) .exe

Correct Answer: (A) .py

Solution:

Step 1: Understanding the Concept:

File extensions identify the type of file and the application associated with it.

Step 2: Key Formula or Approach:

Python scripts are text files containing Python code, which are interpreted by the Python interpreter.

Step 3: Detailed Explanation:

.py is the standard extension for Python source files.

.java is for Java source code.

.exe is for executable files in Windows.

.pt is often used for PyTorch model files, but not standard scripts.

Step 4: Final Answer:

The extension is .py.

💡 Quick Tip

Other Python-related extensions include .pyc (compiled bytecode) and .ipynb (Jupyter Notebooks).

22. “HTML” stands for

- (A) Hyper Text Making Language
- (B) Hyper Text Markup Language
- (C) High Tech Markup Language
- (D) Hyper Text Management Logic

Correct Answer: (B) Hyper Text Markup Language

Solution:

Step 1: Understanding the Concept:

This is an abbreviation related to web development.

Step 2: Key Formula or Approach:

Identify the standard acronym used for web page structure.

Step 3: Detailed Explanation:

HTML is the standard markup language for documents designed to be displayed in a web browser.

- Hyper Text: Text that contains links to other text.
- Markup Language: A language that uses tags to define elements within a document.

Step 4: Final Answer:

HTML stands for Hyper Text Markup Language.

💡 Quick Tip

Do not confuse "Markup" with "Programming". HTML is not a programming language; it's a structural language.

23. In Microsoft Excel, the intersection of a row and a column is called a

- (A) Box
- (B) Table
- (C) Cell
- (D) Grid

Correct Answer: (C) Cell

Solution:

Step 1: Understanding the Concept:

Excel is a spreadsheet application organized into a grid of horizontal rows and vertical columns.

Step 2: Key Formula or Approach:

The fundamental unit for data entry in a spreadsheet is defined by its horizontal and vertical coordinates.

Step 3: Detailed Explanation:

Rows are labeled with numbers and columns with letters.

The point where they meet (e.g., A1, B10) is called a "Cell".

Step 4: Final Answer:

The intersection is called a Cell.

💡 Quick Tip

The "Active Cell" is the one currently selected, identified by a thick border.

24. First-generation computers used which technology?

- (A) Transistors
- (B) Integrated Circuits
- (C) Vacuum Tubes
- (D) Microprocessors

Correct Answer: (C) Vacuum Tubes

Solution:

Step 1: Understanding the Concept:

Computer history is divided into generations based on the primary electronic component used.

Step 2: Key Formula or Approach:

- 1st Gen: Vacuum Tubes
- 2nd Gen: Transistors
- 3rd Gen: Integrated Circuits (ICs)
- 4th Gen: Microprocessors

Step 3: Detailed Explanation:

First-generation computers (1940s-1950s) were massive and generated a lot of heat because they relied on thousands of vacuum tubes for circuitry.

Step 4: Final Answer:

First-generation computers used Vacuum Tubes.

💡 Quick Tip

Think of the components getting smaller over time: Tubes (huge) → Transistors (smaller) → ICs (tiny) → Microprocessors (microscopic).

25. 1024 Kilobytes (KB) is equal to

- (A) 1 MB
- (B) 1 GB
- (C) 1 TB
- (D) 1 Byte

Correct Answer: (A) 1 MB

Solution:

Step 1: Understanding the Concept:

Computer storage is measured in units based on powers of 2 (specifically $2^{10} = 1024$).

Step 2: Key Formula or Approach:

- 1024 Bytes = 1 KB
- 1024 KB = 1 MB (Megabyte)
- 1024 MB = 1 GB (Gigabyte)
- 1024 GB = 1 TB (Terabyte)

Step 3: Detailed Explanation:

Kilobytes are the thousands, Megabytes are the millions (relative to bytes).

Since the factor is 1024, 1024 KB makes exactly 1 Megabyte.

Step 4: Final Answer:

1024 KB equals 1 MB.

 Quick Tip

In binary prefix terms, 1024 KB is actually 1 MiB (Mebibyte), but in general computer exams, MB is used interchangeably with 1024 KB.

26. Which key combination is universally used to “Undo” an action?

- (A) Ctrl + C
- (B) Ctrl + V
- (C) Ctrl + Z
- (D) Ctrl + X

Correct Answer: (C) Ctrl + Z

Solution:

Step 1: Understanding the Concept:

Keyboard shortcuts are used to perform common software tasks quickly.

Step 2: Key Formula or Approach:

- Ctrl + C: Copy
- Ctrl + V: Paste
- Ctrl + X: Cut
- Ctrl + Z: Undo

Step 3: Detailed Explanation:

Ctrl + Z is the universal command across almost all operating systems and software (Windows, macOS, Office, Browsers) to reverse the last action performed by the user.

Step 4: Final Answer:

The shortcut for Undo is Ctrl + Z.

💡 Quick Tip

Ctrl + Y is typically the shortcut for "Redo" (the opposite of Undo).

27. Which of the following is NOT an Operating System?

- (A) Linux
- (B) Oracle
- (C) DOS
- (D) Windows

Correct Answer: (B) Oracle

Solution:**Step 1: Understanding the Concept:**

An Operating System (OS) is software that manages computer hardware and software resources.

Step 2: Key Formula or Approach:

Check each option to see if it functions as a platform to run applications and manage hardware.

Step 3: Detailed Explanation:

- Linux is a family of open-source Unix-like OSs.
- Windows is a graphical OS by Microsoft.
- DOS (Disk Operating System) is an older text-based OS.
- Oracle is a company best known for its Database Management System (DBMS) software, not an Operating System.

Step 4: Final Answer:

Oracle is NOT an Operating System.

💡 Quick Tip

Always distinguish between application software (like Oracle DBMS or Chrome) and system software (like Windows or Linux).

28. The ASCII value of the character 'A' is

- (A) 64
- (B) 65
- (C) 97
- (D) 90

Correct Answer: (B) 65

Solution:

Step 1: Understanding the Concept:

ASCII (American Standard Code for Information Interchange) is a character encoding standard for electronic communication.

Step 2: Key Formula or Approach:

Standard ASCII mappings:

- 'A' through 'Z' = 65 to 90
- 'a' through 'z' = 97 to 122
- '0' through '9' = 48 to 57

Step 3: Detailed Explanation:

The uppercase letter 'A' is the first letter in the sequence of alphabet characters in ASCII, starting at 65.

Step 4: Final Answer:

The ASCII value of 'A' is 65.

 Quick Tip

To get the ASCII of 'a' (lowercase) from 'A' (uppercase), add 32. So, $65 + 32 = 97$.

29. In a flowchart, a diamond-shaped symbol represents

- (A) Processing
- (B) Input/Output
- (C) Decision
- (D) Terminator

Correct Answer: (C) Decision

Solution:

Step 1: Understanding the Concept:

Flowcharts use standardized symbols to represent different types of steps or actions in a process or algorithm.

Step 2: Key Formula or Approach:

- Rectangle: Process/Operation
- Parallelogram: Input/Output
- Diamond: Decision/Condition
- Oval/Rounded Rectangle: Terminator (Start/End)

Step 3: Detailed Explanation:

A diamond-shaped symbol is used when there is a condition that leads to two or more branches (like "Yes/No" or "True/False").

Step 4: Final Answer:

The diamond symbol represents a Decision.

💡 Quick Tip

Remember: If there's a question in the algorithm (e.g., Is $X < 5$?), it goes inside a diamond.

30. Which logic gate returns TRUE only if both inputs are TRUE?

- (A) OR Gate
- (B) NAND Gate
- (C) XOR Gate
- (D) AND Gate

Correct Answer: (D) AND Gate

Solution:**Step 1: Understanding the Concept:**

Logic gates are basic building blocks of digital circuits that perform logical functions on one or more binary inputs.

Step 2: Key Formula or Approach:

Truth Tables:

- AND: 1 if both inputs are 1.
- OR: 1 if at least one input is 1.
- XOR: 1 if inputs are different.

Step 3: Detailed Explanation:

The AND gate's output is 1 (TRUE) only when Input A is 1 AND Input B is 1. If any input

is 0 (FALSE), the output is 0.

Step 4: Final Answer:

The AND gate meets this condition.

💡 Quick Tip

Think of an AND gate as a multiplication in binary: $1 \times 1 = 1$, $1 \times 0 = 0$, $0 \times 1 = 0$, $0 \times 0 = 0$.

31. What is the full form of SQL?

- (A) Structured Question Language
- (B) Standard Query Logic
- (C) Structured Query Language
- (D) Simple Query Logic

Correct Answer: (C) Structured Query Language

Solution:

Step 1: Understanding the Concept:

SQL is a domain-specific programming language used for managing data held in a relational database management system (RDBMS).

Step 2: Key Formula or Approach:

Identify the standard acronym used globally in the field of database management and computer science.

Step 3: Detailed Explanation:

SQL stands for Structured Query Language.

- **Structured:** Refers to the fact that the data is stored in tables with defined relationships.
- **Query:** Refers to the request for data or information from a database.
- **Language:** Refers to the set of rules and syntax used to communicate with the database.

Step 4: Final Answer:

The full form of SQL is Structured Query Language.

💡 Quick Tip

SQL was originally developed by IBM in the early 1970s and was called SEQUEL (Structured English Query Language).

32. 1 Byte is equal to

- (A) 4 bits
- (B) 8 bits
- (C) 16 bits
- (D) 32 bits

Correct Answer: (B) 8 bits

Solution:

Step 1: Understanding the Concept:

This question pertains to the fundamental units of data storage in computing systems.

Step 2: Key Formula or Approach:

Recall the hierarchy of binary units:

- 1 Bit = 0 or 1
- 1 Nibble = 4 bits
- 1 Byte = 8 bits

Step 3: Detailed Explanation:

A byte is the smallest addressable unit of memory in most computer architectures. It consists of a sequence of 8 bits, which allows for $2^8 = 256$ different possible values (typically 0 to 255).

Step 4: Final Answer:

1 Byte is equal to 8 bits.

 Quick Tip

A group of 4 bits is called a "Nibble". This is often tested alongside the definition of a Byte.

33. Which data structure works on the principle of LIFO (Last In First Out)?

- (A) Queue
- (B) Stack
- (C) Linked List
- (D) Tree

Correct Answer: (B) Stack

Solution:

Step 1: Understanding the Concept:

Data structures follow specific access patterns for inserting and removing elements. LIFO stands for Last-In, First-Out.

Step 2: Key Formula or Approach:

- Stack: LIFO (Last In First Out)
- Queue: FIFO (First In First Out)

Step 3: Detailed Explanation:

In a Stack data structure, the last element added is the first one to be removed. Think of a stack of plates; you add a plate to the top and take the top plate off first.

Operations:

- Push: Adding an element.
- Pop: Removing the most recently added element.

Step 4: Final Answer:

The Stack works on the LIFO principle.

💡 Quick Tip

Practical examples of LIFO include the "Undo" function in software and the "Back" button in web browsers.

34. Who is known as the father of the World Wide Web (WWW)?

- (A) Bill Gates
- (B) Tim Berners-Lee
- (C) Steve Jobs
- (D) Vint Cerf

Correct Answer: (B) Tim Berners-Lee

Solution:**Step 1: Understanding the Concept:**

This question tests general knowledge regarding historical figures in information technology.

Step 2: Key Formula or Approach:

Identify the inventor of HTML, HTTP, and the first web browser at CERN.

Step 3: Detailed Explanation:

Sir Tim Berners-Lee, a British computer scientist, invented the World Wide Web in 1989 while working at CERN. He wrote the first web server and the first web browser.

Step 4: Final Answer:

Tim Berners-Lee is known as the father of the WWW.

💡 Quick Tip

Vint Cerf (Option D) is often called the "Father of the Internet" (TCP/IP), whereas Tim Berners-Lee is the father of the "Web" (which runs on top of the internet).

35. The "Blue Screen of Death" (BSOD) is typically associated with errors in which Operating System?

- (A) macOS
- (B) Linux
- (C) Microsoft Windows
- (D) Unix

Correct Answer: (C) Microsoft Windows

Solution:**Step 1: Understanding the Concept:**

The Blue Screen of Death is a critical error screen displayed when the system reaches a condition where it can no longer operate safely.

Step 2: Key Formula or Approach:

Recall common terminology associated with desktop operating system failures.

Step 3: Detailed Explanation:

The BSOD is a stop error screen displayed on Microsoft Windows systems after a fatal system error. It indicates a system crash, where the OS has reached a state where it can no longer operate safely to prevent data loss or damage.

Step 4: Final Answer:

The BSOD is associated with Microsoft Windows.

💡 Quick Tip

In macOS, the equivalent of a BSOD is the "Kernel Panic" screen or the spinning "beach ball".

36. Which gas is most abundant in the Earth's atmosphere?

- (A) Oxygen
- (B) Carbon Dioxide
- (C) Nitrogen
- (D) Hydrogen

Correct Answer: (C) Nitrogen

Solution:

Step 1: Understanding the Concept:

This question is related to the composition of Earth's atmosphere.

Step 2: Key Formula or Approach:

Recall the percentage distribution of major gases in the air.

Step 3: Detailed Explanation:

The composition of dry air is approximately:

- Nitrogen (N_2): 78.08%
- Oxygen (O_2): 20.95%
- Argon (Ar): 0.93%
- Carbon Dioxide (CO_2): 0.04%

Step 4: Final Answer:

Nitrogen is the most abundant gas in the atmosphere.

💡 Quick Tip

Many people mistakenly choose Oxygen because it is vital for life, but Nitrogen is by far the most dominant gas by volume.

37. "ChatGPT" was developed by which organization?

- (A) Google
- (B) Meta
- (C) OpenAI
- (D) Microsoft

Correct Answer: (C) OpenAI

Solution:

Step 1: Understanding the Concept:

This tests knowledge of current events and significant developments in Artificial Intelligence (AI).

Step 2: Key Formula or Approach:

Identify the creator of the GPT (Generative Pre-trained Transformer) series of models.

Step 3: Detailed Explanation:

ChatGPT is an AI chatbot developed by OpenAI, an AI research and deployment company. It was released in November 2022. While Microsoft is a major investor in OpenAI, the developer remains OpenAI.

Step 4: Final Answer:

ChatGPT was developed by OpenAI.

💡 Quick Tip

Google developed "Bard" (now Gemini) and Meta developed "Llama" as competitors to ChatGPT.

38. Light year is a unit of

- (A) Time
- (B) Distance
- (C) Light intensity
- (D) Mass

Correct Answer: (B) Distance

Solution:**Step 1: Understanding the Concept:**

A light year is a measurement used in astronomy to quantify the vast spaces between celestial objects.

Step 2: Key Formula or Approach:

Definition: 1 Light Year = The distance light travels in one vacuum year.

$$\text{Distance} = \text{Speed} \times \text{Time}$$

Step 3: Detailed Explanation:

Light travels at approximately 3×10^8 meters per second. In one year, light covers about 9.46 trillion kilometers. Despite having the word "year" in its name, it measures the **distance** covered, not the time elapsed.

Step 4: Final Answer:

Light year is a unit of distance.

 Quick Tip

Don't be fooled by the word "year". Just like "kilometer" is a unit of distance, "light-year" is also for distance.

39. The headquarters of ISRO is located in

- (A) Mumbai
- (B) New Delhi
- (C) Bengaluru
- (D) Chennai

Correct Answer: (C) Bengaluru

Solution:

Step 1: Understanding the Concept:

ISRO stands for Indian Space Research Organisation. This question tests knowledge of important Indian institutions.

Step 2: Key Formula or Approach:

Identify the city known as the "Space City of India" or "Silicon Valley of India".

Step 3: Detailed Explanation:

The headquarters of ISRO is located in Bengaluru (formerly Bangalore), Karnataka. It was established in 1969 and is the primary space agency of India.

Step 4: Final Answer:

The headquarters is in Bengaluru.

 Quick Tip

While the headquarters is in Bengaluru, the main launch center (Satish Dhawan Space Centre) is in Sriharikota, Andhra Pradesh.

40. Who is the current CEO of Google (Alphabet Inc.)?

- (A) Satya Nadella
- (B) Sundar Pichai
- (C) Mark Zuckerberg
- (D) Elon Musk

Correct Answer: (B) Sundar Pichai

Solution:

Step 1: Understanding the Concept:

This tests knowledge of current leadership in major global technology companies.

Step 2: Key Formula or Approach:

Match the leaders to their companies:

- Satya Nadella → Microsoft
- Sundar Pichai → Google/Alphabet
- Mark Zuckerberg → Meta
- Elon Musk → Tesla/SpaceX/X

Step 3: Detailed Explanation:

Sundar Pichai is the Indian-American business executive who serves as the CEO of both Google and its parent company, Alphabet Inc. He took over as Google CEO in 2015 and Alphabet CEO in 2019.

Step 4: Final Answer:

The current CEO is Sundar Pichai.

 Quick Tip

Sundar Pichai and Satya Nadella are both alumni of prestigious Indian institutes (IIT Kharagpur and Manipal Institute of Technology, respectively).

41. The SI unit of Electric Power is

- (A) Joule
- (B) Volt
- (C) Watt
- (D) Ampere

Correct Answer: (C) Watt

Solution:

Step 1: Understanding the Concept:

Power is the rate at which work is done or energy is transferred.

Step 2: Key Formula or Approach:

$$\text{Power} = \frac{\text{Energy}}{\text{Time}}$$
$$P = V \times I$$

Step 3: Detailed Explanation:

- Joule is the unit of energy.
- Volt is the unit of potential difference.
- Ampere is the unit of electric current.
- Watt is the unit of power, defined as 1 Joule per second.

Step 4: Final Answer:

The SI unit of electric power is the Watt.

💡 Quick Tip

Remember the formula $P = VI$. Since V is in Volts and I is in Amperes, 1 Watt is also equal to 1 Volt-Ampere.

42. Which planet is known as the “Red Planet”?

- (A) Venus
- (B) Jupiter
- (C) Mars
- (D) Saturn

Correct Answer: (C) Mars

Solution:**Step 1: Understanding the Concept:**

This is a standard question about the characteristics of planets in our solar system.

Step 2: Key Formula or Approach:

Identify the planet associated with a reddish appearance due to iron oxide.

Step 3: Detailed Explanation:

Mars is called the “Red Planet” because its surface is covered in iron oxide (rust), which gives it a reddish hue that is visible even to the naked eye from Earth.

Step 4: Final Answer:

Mars is known as the Red Planet.

💡 Quick Tip

Venus is the “Hottest Planet”, Jupiter is the “Largest Planet”, and Saturn is the “Ringed Planet”.

43. “PDF” stands for

- (A) Portable Document Format
- (B) Public Document File
- (C) Printable Data Format
- (D) Personal Data File

Correct Answer: (A) Portable Document Format

Solution:

Step 1: Understanding the Concept:

This tests knowledge of common computer file format abbreviations.

Step 2: Key Formula or Approach:

Identify the file format developed by Adobe in 1992 for document exchange.

Step 3: Detailed Explanation:

PDF stands for Portable Document Format. It is used to present and exchange documents reliably, independent of software, hardware, or operating system.

Step 4: Final Answer:

PDF stands for Portable Document Format.

Quick Tip
PDF is an "open standard" maintained by the International Organization for Standardization (ISO).

44. Which element is used as a semiconductor in computer chips?

- (A) Copper
- (B) Silicon
- (C) Iron
- (D) Silver

Correct Answer: (B) Silicon

Solution:

Step 1: Understanding the Concept:

Semiconductors are materials with electrical conductivity between that of a conductor and an insulator.

Step 2: Key Formula or Approach:

Recall the material that forms the basis of the "Silicon Valley" name and integrated circuits.

Step 3: Detailed Explanation:

Silicon is a chemical element with symbol Si and atomic number 14. It is the most common material used to manufacture semiconductors and computer chips because of its abundance and favorable electronic properties.

Step 4: Final Answer:

Silicon is the element used as a semiconductor.

💡 Quick Tip

Germanium was the first semiconductor used, but Silicon eventually replaced it because Silicon can operate at higher temperatures.

45. Who invented the telephone?

- (A) Thomas Edison
- (B) Alexander Graham Bell
- (C) Nikola Tesla
- (D) Albert Einstein

Correct Answer: (B) Alexander Graham Bell

Solution:**Step 1: Understanding the Concept:**

This is a general science/history question about famous inventors.

Step 2: Key Formula or Approach:

Match the inventors to their most famous inventions:

- Edison → Light bulb
- Bell → Telephone
- Tesla → AC current

Step 3: Detailed Explanation:

Alexander Graham Bell was a Scottish-born inventor who is credited with inventing and patenting the first practical telephone in 1876.

Step 4: Final Answer:

Alexander Graham Bell invented the telephone.

 Quick Tip

The first words spoken on the telephone were: "Mr. Watson, come here, I want to see you."

46. The chemical formula for common salt is

- (A) H_2O
- (B) $NaCl$
- (C) KCl
- (D) CO_2

Correct Answer: (B) $NaCl$

Solution:

Step 1: Understanding the Concept:

Common salt is an ionic compound composed of Sodium and Chlorine.

Step 2: Key Formula or Approach:

Common salt = Sodium Chloride.

Step 3: Detailed Explanation:

Sodium is Na and Chlorine is Cl . In the compound, they form an ionic bond as Na^+ and Cl^- , resulting in the chemical formula $NaCl$.

- H_2O is Water.
- CO_2 is Carbon Dioxide.
- KCl is Potassium Chloride.

Step 4: Final Answer:

The formula is $NaCl$.

 Quick Tip

In salt, Sodium is a metal and Chlorine is a non-metal. This is a classic example of an ionic bond.

47. Which social media platform was formerly known as Twitter?

- (A) Threads
- (B) X
- (C) Mastodon
- (D) Telegram

Correct Answer: (B) X

Solution:

Step 1: Understanding the Concept:

This tests knowledge of recent rebranding and acquisitions in the tech industry.

Step 2: Key Formula or Approach:

Identify the platform acquired by Elon Musk in 2022 that underwent a major name change.

Step 3: Detailed Explanation:

Elon Musk acquired Twitter in October 2022. In July 2023, he officially rebranded the platform to "X" and changed the famous bird logo to a stylized X logo.

Step 4: Final Answer:

Twitter is now known as X.

 Quick Tip

Threads is the competitor launched by Meta to rival X.

48. Choose the synonym of "Candid".

- (A) Deceptive
- (B) Frank
- (C) Secretive
- (D) Ambiguous

Correct Answer: (B) Frank

Solution:

Step 1: Understanding the Concept:

A synonym is a word that has the same or nearly the same meaning as another word.

Step 2: Key Formula or Approach:

Analyze the meaning of "Candid": Truthful, straightforward, or outspoken.

Step 3: Detailed Explanation:

- "Frank" means honest and direct in speech or writing.
- "Deceptive" is the opposite (lying).
- "Secretive" is the opposite (hiding things).
- "Ambiguous" means unclear.

Step 4: Final Answer:

The synonym of Candid is Frank.

💡 Quick Tip

Think of a "candid photo"—it is an unposed, honest, and natural shot. This helps remember that "candid" means honest or natural.

49. Identify the error in the sentence: "One of the boys are missing from the class."

- (A) One of
- (B) the boys
- (C) are missing
- (D) from the class

Correct Answer: (C) are missing

Solution:

Step 1: Understanding the Concept:

This is a question of "Subject-Verb Agreement".

Step 2: Key Formula or Approach:

In the phrase "One of the [Plural Noun]", the subject is "One", which is singular. Therefore, the verb must also be singular.

Step 3: Detailed Explanation:

The sentence is: "One of the boys are missing..."

Here, the subject is not "boys", it is "One".

Since "One" is singular, the verb should be "is" instead of "are".

Correct sentence: "One of the boys **is** missing from the class."

Step 4: Final Answer:

The error is in the segment "are missing".

💡 Quick Tip

Whenever you see "One of...", mentally ignore the plural noun that follows and match the verb with "One".

50. The idiom "To burn the midnight oil" means

- (A) To waste resources
- (B) To work late into the night
- (C) To start a fire
- (D) To create trouble

Correct Answer: (B) To work late into the night

Solution:

Step 1: Understanding the Concept:

An idiom is a phrase where the meaning is not deducible from the individual words.

Step 2: Key Formula or Approach:

Associate the "oil" (from a lamp) used at "midnight" with the activity being performed.

Step 3: Detailed Explanation:

Before electricity, people used oil lamps. "Burning the midnight oil" meant staying awake and working or studying long after everyone else had gone to sleep.

Step 4: Final Answer:

The idiom means to work late into the night.

 Quick Tip

This is a very common idiom used for students during exam times.

51. Select the correctly spelt word.

- (A) Accomodate
- (B) Accommodate
- (C) Acomodate
- (D) Accomodate

Correct Answer: (B) Accommodate

Solution:

Step 1: Understanding the Concept:

This tests spelling proficiency for commonly misspelled words.

Step 2: Key Formula or Approach:

Recall the specific repeating letters in the word for providing lodging or space.

Step 3: Detailed Explanation:

The word "Accommodate" is derived from Latin. It is unique because it features a double 'c'

and a double 'm'.

- A + CC + O + MM + O + DATE.

Step 4: Final Answer:

The correct spelling is (B) Accommodate.

💡 Quick Tip

Remember: Accommodate is generous enough to accommodate two 'c's and two 'm's!

52. Choose the correct antonym of “Optimistic”.

- (A) Hopeful
- (B) Pessimistic
- (C) Idealistic
- (D) Realistic

Correct Answer: (B) Pessimistic

Solution:

Step 1: Understanding the Concept:

An antonym is a word that means the opposite of another word.

Step 2: Key Formula or Approach:

Define "Optimistic": Feeling or showing hope for the future.

Step 3: Detailed Explanation:

- "Pessimistic" means tending to see the worst aspect of things or believe that the worst will happen.
- "Hopeful" and "Idealistic" are similar to optimistic.
- "Realistic" is neutral.

Step 4: Final Answer:

The antonym of Optimistic is Pessimistic.

💡 Quick Tip

Optimist: Glass is half-full. Pessimist: Glass is half-empty.

53. Select the word which is the exact OPPOSITE of “Artificial”.

- (A) Red
- (B) Natural
- (C) Truthful
- (D) Solid

Correct Answer: (B) Natural

Solution:

Step 1: Understanding the Concept:

This is an antonym question. "Artificial" means made or produced by human beings rather than occurring naturally.

Step 2: Key Formula or Approach:

Find the word that describes things as they exist in nature without human intervention.

Step 3: Detailed Explanation:

- "Natural" means existing in or caused by nature; not made or caused by humankind.
- "Red", "Truthful", and "Solid" are unrelated adjectives.

Step 4: Final Answer:

The opposite of Artificial is Natural.

 Quick Tip

"Synthetic" and "Man-made" are synonyms of Artificial. "Authentic" is also a near-antonym but "Natural" is the most direct opposite.

54. Fill in the blank with the correct preposition: "He is fondplaying cricket."

- (A) with
- (B) of
- (C) in
- (D) at

Correct Answer: (B) of

Solution:

Step 1: Understanding the Concept:

This tests knowledge of "fixed prepositions"—words that are always paired with specific adjectives.

Step 2: Key Formula or Approach:

The adjective "fond" always takes the preposition "of".

Step 3: Detailed Explanation:

The standard English usage is "to be fond of something".

Example: "I am fond of music", "She is fond of dancing".

- Fond with: Incorrect.

- Fond in: Incorrect.

Step 4: Final Answer:

The correct preposition is "of".

💡 Quick Tip

Don't confuse "fond of" with "interested in" or "good at". These are different fixed pairs.

55. One who knows everything is called

(A) Omnipresent

(B) Omnipotent

(C) Omniscient

(D) Optimist

Correct Answer: (C) Omniscient

Solution:

Step 1: Understanding the Concept:

This is a "One Word Substitution" question based on Latin roots.

Step 2: Key Formula or Approach:

Break down the roots:

- "Omni" = All

- "Scient" (from sciens) = Knowing

Step 3: Detailed Explanation:

- "Omniscient": All-knowing.

- "Omnipresent": All-present (everywhere).

- "Omnipotent": All-powerful.

- "Optimist": One who looks at the bright side.

Step 4: Final Answer:

One who knows everything is Omniscient.

 Quick Tip

Think of the word "Science"—it's about knowledge. So "Omni-scient" is "All-knowing".

56. Find the correctly spelt word.

- (A) Embarassment
- (B) Embarrassment
- (C) Emberrassment
- (D) Embarrasment

Correct Answer: (B) Embarrassment

Solution:

Step 1: Understanding the Concept:

Testing spelling proficiency for a word commonly misspelled due to its double consonants.

Step 2: Key Formula or Approach:

The word "Embarrass" is famous for having double 'r' and double 's'.

Step 3: Detailed Explanation:

- Segment 1: Em
- Segment 2: bar
- Segment 3: rrass
- Segment 4: ment

Option (B) "Embarrassment" is the only one with both the double 'r' and double 's'.

Step 4: Final Answer:

The correct spelling is (B).

 Quick Tip

It is "embarrassing" to forget the double 'r' and double 's' in "embarrassment"!

57. Change the voice: "The cat killed the mouse."

- (A) The mouse is killed by the cat.
- (B) The mouse was killed by the cat.
- (C) The mouse has been killed by the cat.
- (D) The mouse had killed the cat.

Correct Answer: (B) The mouse was killed by the cat.

Solution:

Step 1: Understanding the Concept:

Changing from Active to Passive voice involves making the object the new subject while maintaining the original tense.

Step 2: Key Formula or Approach:

Original Sentence: [Subject: Cat] + [Verb: killed (Simple Past)] + [Object: mouse].

Passive Rule for Simple Past: [New Subject] + [was/were] + [V3 (Past Participle)] + [by + Old Subject].

Step 3: Detailed Explanation:

The original verb "killed" is in the Simple Past tense.

1. Move "The mouse" to the subject position.
2. Add the auxiliary verb "was" (since the mouse is singular).
3. Use the V3 form of kill, which is "killed".
4. Add "by the cat".

Result: "The mouse was killed by the cat."

Step 4: Final Answer:

Option (B) is the correct passive form.

 Quick Tip

Always keep the tense same. "Killed" (Past) cannot become "is killed" (Present) or "has been killed" (Present Perfect).

58. The idiom "A piece of cake" means

- (A) A tasty dessert
- (B) Something very easy to do
- (C) Something very expensive
- (D) A part of a plan

Correct Answer: (B) Something very easy to do

Solution:

Step 1: Understanding the Concept:

This tests the understanding of common English metaphorical expressions.

Step 2: Key Formula or Approach:

The phrase describes a task as being as simple as eating a piece of cake.

Step 3: Detailed Explanation:

The idiom "a piece of cake" refers to something that is very easy to accomplish or requires very little effort.

Example: "Solving this math problem was a piece of cake."

Step 4: Final Answer:

The idiom means something very easy to do.

💡 Quick Tip

Synonyms for this idiom include "a walk in the park" or "child's play".

59. Synonym of "Brief" is

- (A) Long
- (B) Short
- (C) Complex
- (D) Detailed

Correct Answer: (B) Short

Solution:**Step 1: Understanding the Concept:**

Finding a word with the same meaning as "Brief".

Step 2: Key Formula or Approach:

Define "Brief": Lasting a short time; using few words.

Step 3: Detailed Explanation:

- "Short": Lasting a small amount of time or distance. (Correct Synonym)
- "Long": Opposite of brief.
- "Detailed": Involving many facts; opposite of brief.
- "Complex": Difficult; unrelated to length.

Step 4: Final Answer:

The synonym is "Short".

 Quick Tip

The word "Concise" is also a very common synonym for "Brief" in formal contexts.

60. Spot the error: "I prefer coffee than tea."

- (A) I prefer
- (B) coffee
- (C) than
- (D) tea

Correct Answer: (C) than

Solution:

Step 1: Understanding the Concept:

This is an error detection question regarding prepositional usage after specific verbs.

Step 2: Key Formula or Approach:

The verb "prefer" is always followed by the preposition "to" when comparing two things, not "than".

Step 3: Detailed Explanation:

In English grammar, certain verbs of preference like "prefer", "senior", "junior", "superior", "inferior" take "to" instead of "than" for comparison.

Incorrect: I prefer coffee **than** tea.

Correct: I prefer coffee **to** tea.

Step 4: Final Answer:

The error is in the word "than".

 Quick Tip

Remember: "Prefer A to B". Never use "than" with "prefer".