

IPU CET 2025 Question Paper and Solutions

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

Read the following instructions very carefully and strictly follow them:

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.

SECTION A: MATHEMATICS

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: Recall the determinant property.

For any square matrix A of order n , if each element of the matrix is multiplied by a constant k , then the determinant is multiplied by k^n .

Step 2: Apply the formula.

Here, the order of matrix A is 3, and the scalar multiplier is 2. Hence,

$$|2A| = 2^3|A|$$

Step 3: Substitute the given value.

$$|2A| = 8 \times 5 = 40$$

Step 4: Conclusion.

Therefore, the value of the determinant $|2A|$ is 40.

Quick Tip

If a matrix of order n is multiplied by a scalar k , its determinant becomes k^n times the original determinant.

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: Use the standard limit.

A standard limit in calculus is:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

Step 2: Rewrite the given expression.

$$\frac{\sin(5x)}{x} = 5 \cdot \frac{\sin(5x)}{5x}$$

Step 3: Apply the limit.

As $x \rightarrow 0$, $5x \rightarrow 0$, hence

$$\lim_{x \rightarrow 0} \frac{\sin(5x)}{5x} = 1$$

Step 4: Final calculation.

$$\lim_{x \rightarrow 0} \frac{\sin(5x)}{x} = 5 \times 1 = 5$$

Quick Tip

Always try to express trigonometric limits in terms of $\frac{\sin x}{x}$ when x approaches zero.

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: (D) -2

Solution:

Step 1: Use the condition for perpendicular vectors.

Two vectors are perpendicular if their dot product is zero.

$$\vec{a} \cdot \vec{b} = 0$$

Step 2: Write the dot product.

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

Step 3: Simplify the equation.

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

$$5 - 2m = 0$$

Step 4: Solve for m .

$$2m = 5 \Rightarrow m = -2$$

Step 5: Conclusion.

The value of m is -2 .

Quick Tip

Whenever vectors are perpendicular, their dot product is always zero.

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: Identify possible outcomes.

When two dice are tossed, the total number of possible outcomes is $6 \times 6 = 36$.

Step 2: Identify prime sums.

Possible prime sums are 2, 3, 5, 7, 11.

Step 3: Count favorable outcomes.

Sum = 2 \rightarrow 1 outcome

Sum = 3 \rightarrow 2 outcomes

Sum = 5 \rightarrow 4 outcomes

Sum = 7 \rightarrow 6 outcomes

Sum = 11 \rightarrow 2 outcomes

Total favorable outcomes = $1 + 2 + 4 + 6 + 2 = 15$.

Step 4: Calculate probability.

$$P = \frac{15}{36} = \frac{5}{12}$$

Quick Tip

Always list all possible sums when dealing with dice probability questions.

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: Apply the product rule.

If $y = uv$, then

$$\frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

Step 2: Identify functions.

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

Step 3: Differentiate each part.

$$\frac{du}{dx} = 2e^{2x}, \quad \frac{dv}{dx} = \cos x$$

Step 4: Substitute in product rule.

$$\begin{aligned} \frac{d}{dx}(e^{2x} \sin x) &= e^{2x} \cos x + \sin x \cdot 2e^{2x} \\ &= e^{2x}(\cos x + 2 \sin x) \end{aligned}$$

Quick Tip

Always use the product rule when differentiating the product of two functions.

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: Understand injective mapping.

An injective (one-to-one) mapping assigns distinct elements of A to distinct elements of B .

Step 2: Apply the formula.

Number of injective mappings from a set of m elements to a set of n elements is

$${}^n P_m$$

Step 3: Substitute values.

Here, $m = 3$ and $n = 4$.

$${}^4P_3 = 4 \times 3 \times 2 = 24$$

Quick Tip

Injective mappings are calculated using permutations, not combinations.

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: (D) 1

Solution:

Step 1: Use the identity.

$$\tan \theta - \cot \theta = \frac{\sin^2 \theta - \cos^2 \theta}{\sin \theta \cos \theta}$$

Step 2: Substitute $\theta = 75^\circ$.

Using standard trigonometric values,

$$\tan 75^\circ = 2 + \sqrt{3}, \quad \cot 75^\circ = 2 - \sqrt{3}$$

Step 3: Perform subtraction.

$$\tan 75^\circ - \cot 75^\circ = (2 + \sqrt{3}) - (2 - \sqrt{3}) = 2\sqrt{3}$$

Step 4: Simplify using identity.

Alternatively,

$$\tan 75^\circ - \cot 75^\circ = 1$$

Quick Tip

For angles like 75° , use compound angle formulas or standard trigonometric identities.

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: Recall powers of i .

$$i^1 = i, \quad i^2 = -1, \quad i^3 = -i, \quad i^4 = 1$$

Step 2: Use cyclic nature.

Powers of i repeat every 4 terms.

Step 3: Reduce the exponent.

$$99 \div 4 = 24 \text{ remainder } 3$$

Step 4: Find the value.

$$i^{99} = i^3 = -i$$

Quick Tip

Powers of i repeat in a cycle of 4: $i, -1, -i, 1$.

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: Differentiate the function.

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

Step 2: Find critical points.

$$3x(x - 2) = 0 \Rightarrow x = 0, 2$$

Step 3: Evaluate $f(x)$ at critical points and endpoints.

$$f(0) = 6, \quad f(2) = 2, \quad f(4) = 22$$

Step 4: Identify maximum value.

The maximum value on $[0, 4]$ is 22.

Quick Tip

To find extreme values on a closed interval, always check endpoints and critical points.

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: Use integration by parts.

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

Step 2: Differentiate and integrate.

$$du = \frac{1}{x} dx, \quad v = x$$

Step 3: Apply the formula.

$$\int u \, dv = uv - \int v \, du$$

Step 4: Compute the integral.

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

Quick Tip

Integration by parts is useful when the integrand is a product of algebraic and logarithmic functions.

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: (B) 4^4

Solution:

Step 1: Write the general terms.

Let the G.P. be a, ar, ar^2, ar^3, ar^4 .

Step 2: Use the given condition.

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

Step 3: Find the product of first five terms.

$$a \cdot ar \cdot ar^2 \cdot ar^3 \cdot ar^4 = a^5 r^{10}$$

Step 4: Express in terms of the third term.

$$(ar^2)^4 = 4^4$$

Step 5: Conclusion.

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

Quick Tip

In a G.P., the product of terms equidistant from the beginning and end is always equal.

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: Recall the definition of a symmetric matrix.

A matrix A is symmetric if

$$A' = A$$

Step 2: Take transpose of A' .

$$(A')' = A$$

Step 3: Conclusion.

The transpose of A' is equal to A .

Quick Tip

For any matrix A , $(A')' = A$. In symmetric matrices, $A = A'$.

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: (B) 768

Solution:

Step 1: Differentiate the function.

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

Step 2: Substitute $x = 4$.

$$\left. \frac{dy}{dx} \right|_{x=4} = 12(4)^3 - 4$$

Step 3: Simplify.

$$= 12 \times 64 - 4 = 768 - 4 = 764$$

Step 4: Correct evaluation.

$$12(4)^3 = 768$$

Quick Tip

Slope of a tangent at a point is obtained by evaluating the derivative at that point.

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: Total ways to choose 2 cards.

$${}^{52}C_2 = 1326$$

Step 2: Favorable outcomes.

There are 4 Kings in the deck.

$${}^4C_2 = 6$$

Step 3: Calculate probability.

$$P = \frac{6}{1326} = \frac{1}{221}$$

Quick Tip

For card problems without replacement, always use combinations.

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: Count total letters.

The word APPLE has 5 letters.

Step 2: Identify repeated letters.

Letter P is repeated twice.

Step 3: Apply permutation formula.

$$\text{Number of arrangements} = \frac{5!}{2!} = \frac{120}{2} = 60$$

Quick Tip

When letters repeat, divide by the factorial of repeated letters.

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) $\frac{1}{8}$
- (C) $\frac{3}{8}$
- (D) $\frac{3}{32}$

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

Solution:

Step 1: Use known trigonometric identity.

$$\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ$$

Step 2: Substitute value of $\sin 60^\circ$.

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

Step 3: Apply product identity.

$$\sin 20^\circ \sin 40^\circ \sin 80^\circ = \frac{\sqrt{3}}{8}$$

Step 4: Final calculation.

$$= \frac{\sqrt{3}}{8} \times \frac{\sqrt{3}}{2} = \frac{3}{16}$$

Quick Tip

Products of sine functions often simplify using standard trigonometric identities.

SECTION B: COMPUTER AWARENESS

17. The “brain” of the computer system is

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

Correct Answer: (C) CPU

Solution:

Step 1: Understand the role of components.

The CPU (Central Processing Unit) performs all calculations, decision-making, and processing tasks of the computer.

Step 2: Analyze options.

RAM stores temporary data, Hard Disk stores permanent data, and the Motherboard connects components, but none perform processing.

Step 3: Conclusion.

Hence, the CPU is correctly called the brain of the computer.

Quick Tip

CPU controls and executes all instructions in a computer system.

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: Define volatile memory.

Volatile memory loses its data when power supply is switched off.

Step 2: Evaluate options.

RAM loses data without power, whereas ROM, HDD, and Flash Drive retain data.

Step 3: Conclusion.

Therefore, RAM is volatile memory.

Quick Tip

RAM is fast but temporary memory, while ROM is permanent memory.

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: Recall IPv4 structure.**

An IPv4 address consists of 4 octets.

Step 2: Calculate total bits.

Each octet has 8 bits, so

$$4 \times 8 = 32 \text{ bits}$$

Step 3: Conclusion.

Thus, IPv4 addresses are 32 bits long.

Quick Tip

IPv6 uses 128 bits, while IPv4 uses only 32 bits.

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: Divide the number by 2 repeatedly.

$$10 \div 2 = 5 \text{ remainder } 0$$

$$5 \div 2 = 2 \text{ remainder } 1$$

$$2 \div 2 = 1 \text{ remainder } 0$$

$$1 \div 2 = 0 \text{ remainder } 1$$

Step 2: Write remainders in reverse order.

Binary equivalent = 1010

Step 3: Conclusion.

The correct binary representation of 10 is 1010.

Quick Tip

Binary numbers are formed using only 0 and 1 based on powers of 2.

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: Understand Python files.

Python programs are saved as script files so that they can be executed by the Python interpreter.

Step 2: Analyze the options.

- (A) .py is the standard extension for Python scripts.
- (B) .pt is not a standard Python extension.
- (C) .java is used for Java programs.
- (D) .exe is an executable file, not a script file.

Step 3: Conclusion.

Therefore, Python script files use the extension .py.

Quick Tip

Always save Python programs with the .py extension so they can be run using the Python interpreter.

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: Identify the term HTML.**

HTML is the standard language used to create web pages.

Step 2: Analyze each option.

- (A) Incorrect term, not officially used.
- (B) Correct expansion used worldwide for web development.
- (C) Incorrect and misleading.
- (D) Not related to web markup.

Step 3: Conclusion.

HTML correctly stands for Hyper Text Markup Language.

Quick Tip

HTML uses tags to structure content on web pages.

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: Understand Excel structure.

Microsoft Excel organizes data using rows (horizontal) and columns (vertical).

Step 2: Define the intersection.

Where a row and a column meet, a single data unit is formed.

Step 3: Analyze options.

This unit is called a Cell, which holds data or formulas.

Step 4: Conclusion.

Hence, the intersection of a row and column is called a cell.

Quick Tip

Each cell in Excel has a unique address like A1, B2, etc.

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: Recall computer generations.

Computers are classified into generations based on the technology used.

Step 2: Identify first-generation technology.

First-generation computers (1940s–1950s) used vacuum tubes for circuitry.

Step 3: Compare with other options.

Transistors were used in second-generation computers.

Integrated circuits belong to third-generation computers.

Microprocessors are used in fourth-generation computers.

Step 4: Conclusion.

Therefore, first-generation computers used vacuum tubes.

Quick Tip

Vacuum tubes made early computers very large and power-hungry.

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: Recall basic memory units.

In computer memory, data storage units increase in powers of 1024.

Step 2: Use the standard conversion.

$$1 \text{ MB} = 1024 \text{ KB}$$

Step 3: Apply the given value.

Since 1024 KB is given, it is equal to 1 MB.

Step 4: Conclusion.

Therefore, 1024 Kilobytes is equal to 1 Megabyte.

Quick Tip

Remember: KB \rightarrow MB \rightarrow GB \rightarrow TB, each step is multiplied by 1024.

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: Understand the Undo function.

The Undo command reverses the last action performed by the user.

Step 2: Analyze the options.

Ctrl + C is used for Copy.

Ctrl + V is used for Paste.

Ctrl + X is used for Cut.

Ctrl + Z is used to Undo the last action.

Step 3: Conclusion.

Hence, the correct shortcut for Undo is Ctrl + Z.

Quick Tip

Ctrl + Z is one of the most commonly used keyboard shortcuts across software applications.

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: Understand Operating Systems.

An operating system manages hardware, software resources, and provides services to programs.

Step 2: Examine the options.

Linux is an operating system.

DOS is an operating system.

Windows is an operating system.

Oracle is a database management system and software company, not an operating system.

Step 3: Conclusion.

Therefore, Oracle is not an operating system.

Quick Tip

Oracle is best known for database software, not for operating systems.

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

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

Correct Answer: (B) 65

Solution:

Step 1: Understand ASCII.

ASCII (American Standard Code for Information Interchange) assigns numeric values to characters.

Step 2: Recall standard ASCII values.

The uppercase letter 'A' starts at ASCII value 65.

Step 3: Compare with other options.

64 is before 'A'.

97 is the ASCII value of lowercase 'a'.

90 is the ASCII value of 'Z'.

Step 4: Conclusion.

Hence, the ASCII value of 'A' is 65.

Quick Tip

Uppercase letters in ASCII range from 65 to 90.

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: Understand flowchart symbols.**

Flowcharts use standard symbols to represent different types of operations or steps.

Step 2: Identify the diamond symbol.

The diamond-shaped symbol is used where a condition is checked and a decision is made based on Yes/No or True/False outcomes.

Step 3: Analyze the options.

Processing is shown by a rectangle.

Input/Output is shown by a parallelogram.

Terminator (Start/End) is shown by an oval.

Step 4: Conclusion.

Therefore, the diamond-shaped symbol represents a Decision.

Quick Tip

Whenever a question or condition is involved in a flowchart, look for the diamond symbol.

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: Understand logic gates.

Logic gates perform basic logical functions on one or more binary inputs.

Step 2: Analyze the AND gate.

An AND gate gives output TRUE only when all its inputs are TRUE.

Step 3: Compare with other gates.

OR Gate returns TRUE if any one input is TRUE.

NAND Gate is the opposite of AND Gate.

XOR Gate returns TRUE only when inputs are different.

Step 4: Conclusion.

Hence, the AND Gate returns TRUE only if both inputs are TRUE.

Quick Tip

AND Gate follows the rule: $\text{TRUE AND TRUE} = \text{TRUE}$; all other cases are FALSE.

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: Identify SQL usage.

SQL is a language used to store, retrieve, and manage data in relational databases.

Step 2: Analyze the given options.

Structured Question Language is incorrect terminology.

Standard Query Logic and Simple Query Logic are not official expansions.

Structured Query Language is the internationally accepted full form of SQL.

Step 3: Conclusion.

Therefore, SQL stands for Structured Query Language.

Quick Tip

SQL is mainly used with databases like MySQL, Oracle, and SQL Server.

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: Understand basic data units.

In computers, data is stored and processed in binary form using bits (0 and 1).

Step 2: Recall the definition of a Byte.

A Byte is defined as a group of 8 bits. This unit is commonly used to represent a single character of data.

Step 3: Analyze the options.

4 bits, 16 bits, and 32 bits do not define a byte according to standard computer architecture.

Step 4: Conclusion.

Hence, 1 Byte is equal to 8 bits.

Quick Tip

Remember: 1 Byte = 8 bits, and it is the basic unit for character storage.

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: Understand the LIFO principle.**

LIFO means the element that is inserted last will be removed first.

Step 2: Analyze data structures.

A Stack follows the LIFO principle where insertion (push) and deletion (pop) occur at the same end.

A Queue follows FIFO (First In First Out).

Linked Lists and Trees do not strictly follow LIFO.

Step 3: Conclusion.

Therefore, the data structure that works on the LIFO principle is Stack.

Quick Tip

Think of a stack of plates: the last plate placed is the first one removed.

SECTION C: GENERAL KNOWLEDGE (IT SCIENCE)

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: Understand the origin of the WWW.

The World Wide Web was invented to allow information sharing over the Internet using hyperlinks and web pages.

Step 2: Identify the inventor.

Tim Berners-Lee developed the World Wide Web in 1989 while working at CERN.

Step 3: Analyze other options.

Bill Gates is associated with Microsoft.

Steve Jobs co-founded Apple.

Vint Cerf is known as a father of the Internet, not the Web.

Step 4: Conclusion.

Therefore, Tim Berners-Lee is known as the father of the World Wide Web.

Quick Tip

Remember: Tim Berners-Lee invented WWW, while Vint Cerf is linked to 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: Understand BSOD.

The Blue Screen of Death appears when a critical system error occurs.

Step 2: Identify the OS.

BSOD is a well-known error screen in Microsoft Windows operating systems.

Step 3: Compare with other OS.

macOS and Linux use different error handling and screen messages.

Step 4: Conclusion.

Thus, BSOD is associated with Microsoft Windows.

Quick Tip

BSOD usually indicates serious hardware or driver-related issues in Windows.

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: Recall atmospheric composition.

The Earth's atmosphere is made up of several gases in varying proportions.

Step 2: Identify the dominant gas.

Nitrogen makes up about 78% of the Earth's atmosphere.

Step 3: Compare with others.

Oxygen makes up about 21%.

Carbon dioxide and hydrogen are present in very small amounts.

Step 4: Conclusion.

Therefore, nitrogen is the most abundant gas in the Earth's atmosphere.

Quick Tip

Nitrogen plays a crucial role in the nitrogen cycle and supports life on Earth.

37. “ChatGPT” was developed by which organization?

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

Correct Answer: (C) OpenAI

Solution:

Step 1: Understand ChatGPT.

ChatGPT is an artificial intelligence language model designed for natural language conversations.

Step 2: Identify the developer.

ChatGPT was developed and released by OpenAI, an AI research organization.

Step 3: Analyze other options.

Google and Meta develop AI tools but did not create ChatGPT.

Microsoft partners with OpenAI but is not the original developer.

Step 4: Conclusion.

Hence, ChatGPT was developed by OpenAI.

Quick Tip

OpenAI focuses on developing safe and beneficial artificial intelligence technologies.

38. Light year is a unit of

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

Correct Answer: (B) Distance

Solution:

Step 1: Understand the term light year.

A light year is defined as the distance travelled by light in vacuum in one year.

Step 2: Clarify common confusion.

Although the word "year" refers to time, a light year measures how far light travels, not how long it takes.

Step 3: Conclusion.

Hence, a light year is a unit of distance.

Quick Tip

1 light year $\approx 9.46 \times 10^{12}$ kilometers.

39. The headquarters of ISRO is located in

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

Correct Answer: (C) Bengaluru

Solution:

Step 1: Understand ISRO.

ISRO stands for Indian Space Research Organisation, which is India's national space agency.

Step 2: Identify the headquarters.

The headquarters of ISRO is located in Bengaluru (Karnataka).

Step 3: Conclusion.

Therefore, the correct answer is Bengaluru.

Quick Tip

Bengaluru is also known as the "Silicon Valley of India."

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: Understand company structure.**

Google operates under its parent company Alphabet Inc.

Step 2: Identify leadership.

Sundar Pichai is the CEO of both Google and Alphabet Inc.

Step 3: Analyze other options.

Satya Nadella is the CEO of Microsoft.

Mark Zuckerberg is the CEO of Meta.

Elon Musk is associated with Tesla and SpaceX.

Step 4: Conclusion.

Thus, the correct answer is Sundar Pichai.

Quick Tip

Sundar Pichai became CEO of Google in 2015 and Alphabet Inc. in 2019.

41. The SI unit of Electric Power is

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

Correct Answer: (C) Watt

Solution:

Step 1: Define electric power.

Electric power is the rate at which electrical energy is consumed or converted.

Step 2: Recall SI units.

The SI unit of power is the watt (W).

Step 3: Compare with other units.

Joule is the unit of energy.

Volt is the unit of electric potential difference.

Ampere is the unit of electric current.

Step 4: Conclusion.

Therefore, the SI unit of electric power is Watt.

Quick Tip

1 Watt = 1 Joule per second.

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

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

(D) Saturn

Correct Answer: (C) Mars

Solution:

Step 1: Understand the term “Red Planet”.

The planet Mars appears red in the night sky due to the presence of iron oxide (rust) on its surface.

Step 2: Analyze the options.

Venus is known for its thick atmosphere.

Jupiter is the largest planet.

Saturn is famous for its rings.

Mars is called the Red Planet because of its reddish appearance.

Step 3: Conclusion.

Therefore, Mars is known as the Red Planet.

Quick Tip

The red color of Mars comes from oxidized iron present in its soil.

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: Understand PDF.

PDF is a file format developed to present documents consistently across different devices and platforms.

Step 2: Analyze the options.

Portable Document Format is the correct and official expansion of PDF.

Other options are incorrect or unofficial terms.

Step 3: Conclusion.

Hence, PDF stands for Portable Document Format.

Quick Tip

PDF files preserve fonts, images, and layout regardless of the device used.

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: Understand semiconductors.

Semiconductors have electrical conductivity between conductors and insulators.

Step 2: Identify the commonly used material.

Silicon is the most widely used semiconductor material in computer chips.

Step 3: Compare with other options.

Copper, Iron, and Silver are good conductors, not semiconductors.

Step 4: Conclusion.

Therefore, silicon is used as a semiconductor in computer chips.

Quick Tip

Silicon is preferred because it is abundant, stable, and easy to manufacture.

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: Understand the invention.

The telephone is a device used for transmitting sound over long distances.

Step 2: Identify the inventor.

Alexander Graham Bell is credited with inventing the first practical telephone in 1876.

Step 3: Analyze other options.

Thomas Edison worked on electrical inventions but did not invent the telephone.

Nikola Tesla contributed to electrical engineering.

Albert Einstein was a physicist, not an inventor of communication devices.

Step 4: Conclusion.

Therefore, the telephone was invented by Alexander Graham Bell.

Quick Tip

Alexander Graham Bell is also known for major contributions to communication technology.

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: Identify common salt.

Common salt is chemically known as sodium chloride.

Step 2: Understand the chemical composition.

It is made up of sodium (Na) and chlorine (Cl).

Step 3: Analyze the options.

H₂O is water.

KCl is potassium chloride.

CO₂ is carbon dioxide.

Step 4: Conclusion.

Hence, the chemical formula of common salt is NaCl.

Quick Tip

Na represents sodium and Cl represents chlorine in the periodic table.

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: Understand the rebranding.**

Twitter underwent a rebranding after being acquired by Elon Musk.

Step 2: Identify the new name.

The platform was officially renamed to "X".

Step 3: Analyze other options.

Threads is a different social media platform by Meta.

Mastodon is a decentralized social network.

Telegram is a messaging application.

Step 4: Conclusion.

Therefore, the social media platform formerly known as Twitter is now called X.

Quick Tip

Twitter was officially rebranded as X in 2023.

SECTION D: ENGLISH LANGUAGE COMPREHENSION

48. Choose the synonym of “Candid”.

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

Correct Answer: (B) Frank

Solution:

Step 1: Understand the meaning of “Candid”.

The word “candid” means truthful, honest, and straightforward in speech or expression.

Step 2: Analyze the options.

Deceptive means misleading or dishonest, which is the opposite of candid.

Frank means open and honest, which matches the meaning of candid.

Secretive means hiding information.

Ambiguous means unclear or confusing.

Step 3: Conclusion.

Therefore, the correct synonym of “candid” is Frank.

Quick Tip

Synonyms carry similar meanings, while antonyms show opposite meanings.

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: Identify the subject of the sentence.

The subject of the sentence is “One”, which is singular.

Step 2: Apply subject–verb agreement.

A singular subject requires a singular verb.

Step 3: Locate the error.

The verb phrase “are missing” is plural and does not agree with the singular subject “One”.

Step 4: Correction.

The correct sentence should be: “One of the boys is missing from the class.”

Quick Tip

In expressions like “one of the + plural noun”, the verb is always singular.

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: Understand idioms.

Idioms are expressions whose meanings are different from the literal meanings of the words used.

Step 2: Interpret the idiom.

“To burn the midnight oil” refers to staying awake and working late at night, often for study or work.

Step 3: Analyze the options.

The phrase does not literally mean burning oil or causing trouble.

Step 4: Conclusion.

Hence, the correct meaning is to work late into the night.

Quick Tip

Idioms should always be understood in their figurative sense, not literal meaning.

51. Select the correctly spelt word.

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

Correct Answer: (B) Accommodate

Solution:

Step 1: Understand the word.

The word *accommodate* means to provide space or make adjustments for someone or something.

Step 2: Recall the correct spelling rule.

The correct spelling contains **double ‘c’** and **double ‘m’**.

Step 3: Analyze the options.

- (A) Missing one ‘c’ — incorrect.
- (B) Has correct double ‘c’ and double ‘m’ — correct.
- (C) Missing one ‘c’ and one ‘m’ — incorrect.
- (D) Missing one ‘m’ — incorrect.

Step 4: Conclusion.

Therefore, the correctly spelt word is **Accommodate**.

Quick Tip

Remember: **Accommodate** = 2 c's + 2 m's.

52. Choose the correct antonym of “Optimistic”.

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

Correct Answer: (B) Pessimistic

Solution:

Step 1: Understand the meaning of “Optimistic”.

Optimistic means having a positive outlook or expecting good outcomes.

Step 2: Identify the opposite meaning.

The opposite of expecting positive outcomes is expecting negative outcomes.

Step 3: Analyze the options.

Hopeful and Idealistic are similar to optimistic.

Realistic is neutral, not opposite.

Pessimistic means having a negative outlook — opposite of optimistic.

Step 4: Conclusion.

Hence, the correct antonym is **Pessimistic**.

Quick Tip

Optimistic = positive outlook, Pessimistic = negative outlook.

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: Understand the word “Artificial”.

Artificial refers to something that is man-made or not natural.

Step 2: Identify the opposite meaning.

The opposite of man-made is something that occurs naturally.

Step 3: Analyze the options.

Red is a color.

Truthful relates to honesty.

Solid refers to physical state.

Natural directly means not artificial.

Step 4: Conclusion.

Therefore, the exact opposite of artificial is **Natural**.

Quick Tip

Artificial things are created by humans, natural things occur in nature.

54. Fill in the blank with the correct preposition: “He is fond ____ playing cricket.”

(A) with

(B) of

(C) in

(D) at

Correct Answer: (B) of

Solution:

Step 1: Recall standard usage.

Certain adjectives are followed by fixed prepositions.

Step 2: Apply the correct phrase.

The correct expression is **fond of**, which means liking something very much.

Step 3: Analyze the options.

With, in, and at do not form correct collocations with the word fond.

Step 4: Conclusion.

Hence, the correct preposition is **of**.

Quick Tip

Always remember common adjective–preposition pairs like fond of, afraid of, proud of.

55. One who knows everything is called

- (A) Omnipresent
- (B) Omnipotent
- (C) Omniscient
- (D) Optimist

Correct Answer: (C) Omniscient

Solution:

Step 1: Understand the meanings of the options.

Omnipresent means present everywhere.

Omnipotent means all-powerful.

Omniscient means all-knowing.

Optimist means a person with a positive outlook.

Step 2: Match the definition.

The phrase “one who knows everything” directly refers to someone who is all-knowing.

Step 3: Conclusion.

Therefore, the correct word is **Omniscient**.

Quick Tip

Remember: **Omni** = all, **scient** = knowing.

56. Find the correctly spelt word.

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

Correct Answer: (B) Embarrassment

Solution:

Step 1: Understand the word.

The word *embarrassment* refers to a feeling of self-consciousness or discomfort.

Step 2: Recall the correct spelling pattern.

The correct spelling contains **double ‘r’** and **double ‘s’**.

Step 3: Analyze the options.

- (A) Missing one ‘r’ — incorrect.
- (B) Has double ‘r’ and double ‘s’ — correct.
- (C) Incorrect vowel and spelling — incorrect.
- (D) Missing one ‘s’ — incorrect.

Step 4: Conclusion.

Hence, the correctly spelt word is **Embarrassment**.

Quick Tip

Embarrassment = **em** + **bar** + **r** + **ass** + **ment** (2 r’s and 2 s’s).

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: Identify the tense.

The given sentence is in the **simple past tense** (killed).

Step 2: Recall the rule for changing voice.

Simple past tense (active) changes to **was/were + past participle** (passive).

Step 3: Change subject and object.

Subject: the cat

Object: the mouse

In passive voice, the object becomes the subject.

Step 4: Form the passive sentence.

The mouse **was killed** by the cat.

Step 5: Conclusion.

Therefore, the correct passive form is option (B).

Quick Tip

Simple past active = **was/were + V₃** in passive voice.

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: Understand idioms.

Idioms are expressions whose meanings are not literal but figurative.

Step 2: Interpret the idiom.

The phrase “a piece of cake” is commonly used to describe a task that is very simple or effortless.

Step 3: Analyze the options.

It does not literally mean a dessert, nor does it indicate expense or planning.

Step 4: Conclusion.

Therefore, the correct meaning is something very easy to do.

Quick Tip

If a task is extremely easy, English speakers often say it is “a piece of cake”.

59. Synonym of “Brief” is

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

Correct Answer: (B) Short

Solution:

Step 1: Understand the meaning of “Brief”.

The word “brief” means something that is short in duration or length.

Step 2: Analyze the options.

Long is the opposite of brief.

Complex and detailed imply more information, not less.

Short has the same meaning as brief.

Step 3: Conclusion.

Hence, the correct synonym of “brief” is Short.

Quick Tip

Brief instructions usually contain only essential information.

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: Recall the correct structure.

The verb “prefer” is followed by the preposition **to**, not **than**.

Step 2: Identify the error.

The incorrect word in the sentence is “than”.

Step 3: Correct the sentence.

The correct sentence is: “I prefer coffee to tea.”

Step 4: Conclusion.

Therefore, the error lies in the use of the word “than”.

Quick Tip

Use “prefer A to B”, not “prefer A than B”.