OJEE 2026 May 9 Shift 2 MCA

Question Paper with Solutions (Memory-Based)

Conducted by Odisha Joint Entrance Examination Committee (OJEEC))

General Instructions

(i) The examination will be conducted in Computer-Based Test (CBT) mode.

(ii) OJEE MCA 2026 Question Paper consists of 120 questions.

(iii) A total of 480 marks to be attempted in 2 hours.

(iv) Each correct answer carries +4 marks, and there is a negative marking of 1 for incorrect answers.

1. In a group of people it was observed that 86 persons know Odia, 64 know English, 42 know Hindi, 39 know Odia and English, 21 know English and Hindi, 17 know Odia and English, and 16 persons know all the three languages. How many persons in the group know at least one language?

(A) 131

(B) 99

(C) 192

(D) None of the above

Correct Answer: (A) 131

Solution:

Step 1: Understanding the Question:

The problem is based on the Principle of Inclusion-Exclusion for three sets.

Let the sets of people who know Odia, English, and Hindi be O, E, and H respectively.

Based on standard problem structures covering all pairwise intersections, the second instance

should logically be "17 know Odia and Hindi".

We will proceed with this corrected assumption.

Step 2: Key Formula or Approach:

The formula for the union of three sets is:

$$|O \cup E \cup H| = |O| + |E| + |H| - |O \cap E| - |E \cap H| - |O \cap H| + |O \cap E \cap H|$$

Step 3: Detailed Explanation:

From the given data, we have the following set sizes:

$|O| = 86$

$|E| = 64$

$|H| = 42$

$|O \cap E| = 39$

$|E \cap H| = 21$

$|O \cap H| = 17$ (assuming the logical typo correction).

$|O \cap E \cap H| = 16$

Substitute these values directly into the inclusion-exclusion formula:

$$|O \cup E \cup H| = 86 + 64 + 42 - 39 - 21 - 17 + 16$$

$$|O \cup E \cup H| = 192 - 77 + 16$$

$$|O \cup E \cup H| = 115 + 16 = 131$$

Step 4: Final Answer:

The total number of persons who know at least one language is 131.

Quick Tip: Always draw a Venn diagram and start filling values from the innermost intersection (all three sets) outwards to avoid double counting.

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2. The points on the curve $y = 2x^3 + 3x^2 - 8x$ where the tangents are parallel to the line $y = 4x + 3$ are

(A) $(1, -3)$ and $(0, 0)$

(B) $(0, 0)$ and $(-2, 12)$

(C) $(1, -3)$ and $(-2, 12)$

(D) $(0, 0)$ and $(2, 12)$

Correct Answer: (C) $(1, -3)$ and $(-2, 12)$

Solution:

Step 1: Understanding the Question:

We need to find the specific points on the curve $y = 2x^3 + 3x^2 - 8x$ where the tangent is parallel to the given line $y = 4x + 3$.

Lines that are parallel to each other have identical slopes.

Step 2: Key Formula or Approach:

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

Equate this derivative to the slope of the linear equation $y = mx + c$, which is m.

Step 3: Detailed Explanation:

The given line is $y = 4x + 3$, so its slope is $m = 4$.

Now, find the derivative of the curve's equation:

$$\frac{dy}{dx} = \frac{d}{dx}(2x^3 + 3x^2 - 8x) = 6x^2 + 6x - 8$$

Set the derivative equal to the slope of the line:

$$6x^2 + 6x - 8 = 4$$

$$6x^2 + 6x - 12 = 0$$

Divide the entire equation by 6 to simplify:

$$x^2 + x - 2 = 0$$

Factorize the quadratic equation:

$$(x+2)(x-1)=0$$

This gives us the x-coordinates: $x=-2$ and $x=1$.

Now, find the corresponding y-coordinates by substituting x back into the curve's original equation.

For $x=1$:

$$y=2(1)^3+3(1)^2-8(1)=2+3-8=-3$$

So, the first point is $(1,-3)$.

For $x=-2$:

$$y=2(-2)^3+3(-2)^2-8(-2)=2(-8)+3(4)+16=-16+12+16=12$$

So, the second point is $(-2,12)$.

Step 4: Final Answer:

The required points are $(1,-3)$ and $(-2,12)$.

Quick Tip: Two lines are parallel if and only if their slopes are equal. Always equate the first derivative of the curve to the slope of the given line to find the points of tangency.

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3. The focus of the parabola $y^2=16x$ is

(A) $(4,0)$

(B) $(0,4)$

(C) $(2,0)$

(D) $(0,2)$

Correct Answer: (A) $(4,0)$

Solution:

Step 1: Understanding the Question:

We need to determine the geometric coordinates of the focus for the given parabola equation $y^2 = 16x$.

Step 2: Key Formula or Approach:

The standard equation of a rightward opening horizontal parabola is $y^2 = 4ax$.

For this standard form, the focus is located at the coordinates $(a, 0)$.

Step 3: Detailed Explanation:

Compare the given equation $y^2 = 16x$ with the standard form $y^2 = 4ax$.

Equating the coefficients of the x term:

$$4a = 16$$

$$a = \frac{16}{4} = 4$$

Since the parabola is of the form $y^2 = 4ax$, its focus is at $(a, 0)$.

Substitute $a = 4$ to get the coordinates of the focus:

Focus $= (4, 0)$.

Step 4: Final Answer:

The focus of the parabola is $(4, 0)$.

Quick Tip: For standard parabolas of the form $y^2 = 4ax$, the focus is always at $(a, 0)$ and the directrix is the vertical line $x = -a$.

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4. Let A be the set of even natural numbers less than 8 and B be the set of prime numbers less than 7. The number of relations from A to B is

(A) 2^9

(B) $2^9 - 1$

(C) 9^2

(D) $9^2 - 1$

Correct Answer: (A) 2^9

Solution:

Step 1: Understanding the Question:

We are asked to find the total number of mathematical relations from set A to set B.

Step 2: Key Formula or Approach:

If a set A has m elements and a set B has n elements, then the number of elements in their Cartesian product $A \times B$ is $m \times n$.

A relation from A to B is defined as any subset of the Cartesian product $A \times B$.

The total number of relations is simply the number of all possible subsets of $A \times B$, which evaluates to $2^{m \times n}$.

Step 3: Detailed Explanation:

First, let's determine the specific elements of set A.

$A = \{\text{even natural numbers less than } 8\}$

$A = \{2, 4, 6\}$

So, the number of elements in A, denoted as $|A|$, is 3.

Next, let's determine the elements of set B.

$B = \{\text{prime numbers less than } 7\}$

$B = \{2, 3, 5\}$

So, the number of elements in B, denoted as $|B|$, is 3.

The total number of possible relations from A to B is given by:

$$2^{|A| \times |B|} = 2^{3 \times 3} = 2^9$$

Step 4: Final Answer:

The number of relations from A to B is 2^9.

Quick Tip: The total number of relations from a set with m elements to a set with n elements is exactly the size of the power set of their Cartesian product, which is always 2^{mn}.

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5. The word. Case is used in a switch statement. This word is a .....

(A) Key word in java

(B) Function in java

(C) Datatype in java

(D) None of these

Correct Answer: (A) Key word in java

Solution:

Step 1: Understanding the Question:

The question asks us to identify the standard programming classification of the word ‘case‘ as it is utilized within a ‘switch‘ statement block in Java programming.

Step 2: Detailed Explanation:

In Java, as well as in many other core programming languages like C and C++, ‘switch‘ and ‘case‘ are reserved words that hold predefined, special meanings to the language compiler.
These reserved words cannot be redefined by the programmer or used as normal variable names, object names, or general identifiers.
Such predefined words are formally known as "keywords".
Therefore, the word ‘case‘ is a keyword in Java used specifically to define different conditional execution paths (or branches) within a ‘switch‘ block.

Step 3: Final Answer:

The word ‘case‘ is a Key word in java.

Quick Tip: Java features over 50 reserved keywords (such as `int`, `class`, `public`, `switch`, `case`) that cannot ever be utilized as identifiers.

6. Storage capacity of CD is .....

(A) 600MB

(B) 1000MB

(C) 700 MB

(D) None of these

Correct Answer: (C) 700 MB

Solution:

Step 1: Understanding the Question:

We need to identify the standard storage capacity of a typical CD (Compact Disc) used in computing and audio.

Step 2: Detailed Explanation:

A standard CD-ROM (Compact Disc Read-Only Memory) typically holds a standard maximum storage capacity of 700 MB (Megabytes), which translates to about 80 minutes of uncompressed Red Book standard audio.

While the earliest versions of CDs had a slightly lower capacity of 650 MB (74 minutes of audio), 700 MB quickly became the universally manufactured and accepted standard for CD media worldwide.

Options (A) 600MB and (B) 1000MB do not represent any standard CD capacities.

Step 3: Final Answer:

The standard storage capacity of a CD is 700 MB.

Quick Tip: Remember standard optical disc capacities for competitive exams: CD = 700 MB, standard single-layer DVD = 4.7 GB, and standard single-layer Blu-ray = 25 GB.

7. Full form of DVD is .....

(A) Double value disc

(B) Double versatile disk

(C) Digital versatile disc

(D) None of these

Correct Answer: (C) Digital versatile disc

Solution:

Step 1: Understanding the Question:

The question requires identifying the correct full-form expansion of the widely used computer hardware abbreviation "DVD".

Step 2: Detailed Explanation:

DVD is a highly popular optical disc storage format that was originally invented and developed in 1995.

The acronym officially stands for "Digital Versatile Disc".

In its early days, it was sometimes informally referred to as "Digital Video Disc" because its primary initial commercial use was for the distribution of movies. However, "Digital Versatile Disc" is the official and most technically accurate expansion since the medium is designed to be highly versatile—storing various types of data, including software applications, plain documents, and high-quality videos.

Step 3: Final Answer:

The full form of DVD is Digital versatile disc.

Quick Tip: Always choose "Digital Versatile Disc" over "Digital Video Disc" in computer science exams, as it represents the official and generic capability of the storage medium.

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8. The thickness of a CD ROM Is.....mm approximately.

(A) 1.22

(B) 1.5

(C) 0.66

(D) None of these

Correct Answer: (D) None of these

Solution:

Step 1: Understanding the Question:

The question asks for the standard or approximate physical thickness of a CD ROM in millimeters.

Step 2: Detailed Explanation:

According to the foundational physical specifications (the Red Book standard) for optical discs like CDs, the physical dimensions are strictly predefined for global manufacturing consistency.

A standard CD is exactly 120 mm in diameter and exactly 1.2 mm in thickness.

Looking at the provided options, 1.22 mm is very close to 1.2 mm but is technically inaccurate for a strict standard.

Since 1.2 mm is the precise industry standard and none of the numerical options (1.22, 1.5, 0.66) completely match this established value, the most accurate multiple-choice selection is "None of these".

Step 3: Final Answer:

The exact standard thickness of a CD ROM is 1.2 mm. Therefore, none of the given exact numeric options are completely correct.

Quick Tip: The physical base dimensions of standard optical discs (CDs, DVDs, Blu-rays) are universally identical to ensure backward compatibility across different optical disk drives: 120 mm in overall diameter and 1.2 mm in thickness.