

TANCET MCA 2026 May 9 Shift 1

Question Paper with Solutions (Memory-Based)

Conducted by Anna University



General Instructions

- (i) TANCET 2026 MCA Question Paper is divided into 4 sections.
- (ii) TANCET MCA Question Paper consists of 100 questions for a total of 100 marks to be attempted in 2 hours.
- (iii) Physics and Chemistry and Mathematics each contain 60 questions.
- (iv) Each question carries +1 marks for correct answer and there is no negative marking for wrong answer.

1. If $3\sqrt{5} + \sqrt{125} = 17.88$, then what will be the value of $\sqrt{80} + 16\sqrt{5}$?

- (A) 22.35
- (B) 44.7
- (C) 13.41
- (D) 21.66

Correct Answer: (B) 44.7

Solution:

Step 1: Understanding the Question:

We are given the value of an expression involving surds and need to find the value of another similar expression.

We should first simplify the given expression to find the value of $\sqrt{5}$.

Step 2: Key Formula or Approach:

Simplify the square roots by finding perfect square factors: $\sqrt{a^2b} = a\sqrt{b}$.

Step 3: Detailed Explanation:

Given equation:

$$3\sqrt{5} + \sqrt{125} = 17.88$$

Simplify $\sqrt{125}$:

$$\sqrt{125} = \sqrt{25 \times 5} = 5\sqrt{5}$$

Substitute this back into the equation:

$$3\sqrt{5} + 5\sqrt{5} = 17.88$$

$$8\sqrt{5} = 17.88$$

Now, solve for $\sqrt{5}$:

$$\sqrt{5} = \frac{17.88}{8} = 2.235$$

Next, we need to evaluate the target expression: $\sqrt{80} + 16\sqrt{5}$.

Simplify $\sqrt{80}$:

$$\sqrt{80} = \sqrt{16 \times 5} = 4\sqrt{5}$$

Substitute this into the target expression:

$$4\sqrt{5} + 16\sqrt{5} = 20\sqrt{5}$$

Finally, substitute the value of $\sqrt{5}$ we found earlier:

$$20 \times 2.235 = 44.7$$

Step 4: Final Answer:

The value of the expression is 44.7.

Quick Tip: Always simplify surds to their lowest base form (like $\sqrt{5}$) before performing addition or substitution to avoid complex decimal calculations early on.

2. If m and n are whole numbers and $m^n = 196$, what is the value of $(m - 3)^{n+1}$?

- (A) 1
- (B) 121
- (C) 2744
- (D) 1331

Correct Answer: (D) 1331

Solution:

Step 1: Understanding the Question:

We are given an equation $m^n = 196$ where m and n are whole numbers.

We need to find the possible values for m and n and then evaluate the given expression.

Step 2: Key Formula or Approach:

Express the number 196 as a power of a whole number to find matching values for the base m and exponent n .

Step 3: Detailed Explanation:

We know that 196 is a perfect square.

$$196 = 14^2$$

Comparing this with m^n , we get $m = 14$ and $n = 2$.

(Note: Another possibility is 196^1 , which gives $m = 196, n = 1$. However, since test questions typically aim for the simplest non-trivial base, we proceed with $m = 14, n = 2$).

We need to find the value of $(m - 3)^{n+1}$.

Substitute the values of m and n :

$$\begin{aligned} & (14 - 3)^{2+1} \\ &= (11)^3 \\ &= 11 \times 11 \times 11 = 1331 \end{aligned}$$

This matches option (D).

Step 4: Final Answer:

The value of the expression is 1331.

Quick Tip: Familiarity with squares and cubes of numbers up to 20 helps quickly identify relationships like $14^2 = 196$ and $11^3 = 1331$.

3. If each edge of a cube is increased by 50%, find the percentage increase in its surface area.

- (A) 125
- (B) 150
- (C) 175
- (D) 110

Correct Answer: (A) 125

Solution:

Step 1: Understanding the Question:

The problem asks for the percentage change in the surface area of a cube when its side length is increased by a specific percentage.

Step 2: Key Formula or Approach:

The total surface area (S) of a cube with edge length a is given by $S = 6a^2$.

Percentage increase is calculated as $\frac{\text{New Area} - \text{Original Area}}{\text{Original Area}} \times 100\%$.

Step 3: Detailed Explanation:

Let the original edge of the cube be a .

The original surface area is $S_1 = 6a^2$.

The new edge length after a 50% increase is:

$$a' = a + 0.5a = 1.5a$$

The new surface area is:

$$S_2 = 6(a')^2 = 6(1.5a)^2$$

$$S_2 = 6(2.25a^2) = 2.25(6a^2) = 2.25S_1$$

The increase in surface area is:

$$\Delta S = S_2 - S_1 = 2.25S_1 - 1S_1 = 1.25S_1$$

The percentage increase is:

$$\text{Percentage Increase} = \left(\frac{1.25S_1}{S_1} \right) \times 100\% = 125\%$$

Step 4: Final Answer:

The percentage increase in its surface area is 125%.

Quick Tip: For any 2D area proportional to the square of a linear dimension, if the linear dimension scales by a factor k , the area scales by k^2 . Here, $k = 1.5$, so the area scales by $1.5^2 = 2.25$, which is a 125% increase.

4. The average age of a class of 22 students is 21 years. The average increased by 1 when the teacher's age also included. What is the age of the teacher?

- (A) 48
- (B) 45
- (C) 43
- (D) 44

Correct Answer: (D) 44

Solution:

Step 1: Understanding the Question:

We need to find the age of the teacher based on the change in the average age of a group when the teacher is added to it.

Step 2: Key Formula or Approach:

The sum of all ages equals the average age multiplied by the number of people.

$$\text{Sum} = \text{Average} \times N.$$

The age of the newly added person is the difference between the new sum and the old sum.

Step 3: Detailed Explanation:

First, calculate the total age of the 22 students.

$$\text{Total age of students} = 22 \times 21 = 462 \text{ years}$$

When the teacher is included, the total number of people becomes $22 + 1 = 23$.

The new average age increases by 1, so it becomes $21 + 1 = 22$ years.

Now, calculate the new total age of the students and the teacher combined.

$$\text{New total age} = 23 \times 22 = 506 \text{ years}$$

The age of the teacher is the difference between the new total age and the original total age.

$$\text{Age of teacher} = 506 - 462 = 44 \text{ years}$$

Step 4: Final Answer:

The age of the teacher is 44 years.

Quick Tip: A faster method: The teacher's age must be the new average plus the total increase given to the rest of the group. Teacher's age = New Average + (Number of students \times Increase) = $22 + (22 \times 1) = 44$.

5. A vendor bought 6 toffees for a rupee. How many for a rupee must he sell to gain 20%?

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

Correct Answer: (C) 5

Solution:

Step 1: Understanding the Question:

The question gives the cost price in terms of quantity per rupee and asks for the selling price in terms of quantity per rupee to achieve a specific profit percentage.

Step 2: Key Formula or Approach:

$$\text{Selling Price (SP)} = \text{Cost Price (CP)} \times \left(1 + \frac{\text{Profit \%}}{100}\right).$$

Work with the price of a single unit to avoid confusion.

Step 3: Detailed Explanation:

The vendor bought 6 toffees for Rs. 1.

Therefore, the Cost Price (CP) of 1 toffee is Rs. $\frac{1}{6}$.

To gain a profit of 20%, the Selling Price (SP) of 1 toffee must be:

$$\text{SP} = \text{CP} \times \left(\frac{100 + 20}{100}\right)$$

$$\text{SP} = \frac{1}{6} \times \frac{120}{100}$$

$$\text{SP} = \frac{1}{6} \times \frac{6}{5} = \frac{1}{5} \text{ Rs.}$$

This means that 1 toffee is sold for Rs. $\frac{1}{5}$.

To find how many toffees are sold for Rs. 1, we take the reciprocal:

$$\text{Number of toffees for Rs. 1} = \frac{1}{\text{SP of 1 toffee}} = \frac{1}{1/5} = 5$$

Step 4: Final Answer:

He must sell 5 toffees for a rupee.

Quick Tip: When the investment amount is constant (e.g., one rupee), the quantity sold is inversely proportional to the price multiplier. To gain 20% (which is a multiplier of 1.2 or 6/5), you must sell 5/6 of the original quantity. $6 \times (5/6) = 5$.

6. A trader mixes 26 kg of rice at Rs.20 per kg with 30 kg of rice of other variety at Rs.36 per

kg and sells the mixture at Rs.30 per kg. His profit percent is

- (A) No profit, no loss
- (B) 5
- (C) 8
- (D) 10

Correct Answer: (B) 5

Solution:

Step 1: Understanding the Question:

We are given the quantities and unit prices of two types of rice that are mixed together. We need to find the overall profit percentage after selling the entire mixture at a given rate.

Step 2: Key Formula or Approach:

First, calculate the total Cost Price (CP) and the total Selling Price (SP).

Profit = Total SP – Total CP.

Profit % = $\left(\frac{\text{Profit}}{\text{Total CP}}\right) \times 100$.

Step 3: Detailed Explanation:

Let's find the total Cost Price (CP) of the mixture.

Cost of 26 kg rice at Rs. 20/kg = $26 \times 20 = 520$ Rs.

Cost of 30 kg rice at Rs. 36/kg = $30 \times 36 = 1080$ Rs.

Total CP of the mixture = $520 + 1080 = 1600$ Rs.

Total weight of the mixture = $26 + 30 = 56$ kg.

The trader sells the entire mixture at Rs. 30 per kg.

Total Selling Price (SP) = $56 \times 30 = 1680$ Rs.

Now, calculate the profit:

$$\text{Profit} = \text{Total SP} - \text{Total CP} = 1680 - 1600 = 80 \text{ Rs.}$$

Finally, calculate the profit percentage:

$$\text{Profit \%} = \left(\frac{80}{1600}\right) \times 100\%$$

$$\text{Profit \%} = \frac{1}{20} \times 100\% = 5\%$$

Step 4: Final Answer:

His profit percent is 5%.

Quick Tip: You can also solve this using the weighted average cost price: $\frac{26 \times 20 + 30 \times 36}{56} = \frac{1600}{56} \approx 28.57$. Comparing this unit CP with the unit SP of 30 yields the same profit margin, but working with total values avoids messy fractions.

7. Tarun got 30% concession on the labelled price of an article and sold it for Rs.8,750 with 25% profit on the price he bought. What was the labelled price?

- (A) Rs.10,000
- (B) Rs.12,000
- (C) Rs.16,000
- (D) Rs.18,000

Correct Answer: (A) Rs.10,000

Solution:

Step 1: Understanding the Question:

We need to find the original labelled price of an article. We know the discount percentage Tarun received, his profit percentage when he sold it, and his final selling price.

Step 2: Key Formula or Approach:

Let the Labelled Price be L .

$$\text{Cost Price (CP)} = L \times \left(1 - \frac{\text{Discount \%}}{100}\right).$$

$$\text{Selling Price (SP)} = \text{CP} \times \left(1 + \frac{\text{Profit \%}}{100}\right).$$

Step 3: Detailed Explanation:

Let the labelled price of the article be x .

Tarun bought it at a 30% concession (discount).

So, his Cost Price (CP) is $x - 0.30x = 0.70x$.

He sold the article for Rs. 8,750 and made a 25% profit on his cost price.

Therefore, the Selling Price (SP) is:

$$SP = CP \times 1.25$$

$$8750 = 0.70x \times 1.25$$

$$8750 = 0.875x$$

Now, solve for x :

$$x = \frac{8750}{0.875}$$

To simplify, multiply the numerator and denominator by 1000:

$$x = \frac{8750000}{875} = 10000$$

The labelled price was Rs. 10,000.

Step 4: Final Answer:

The labelled price was Rs. 10,000.

Quick Tip: You can work backwards: If SP is 8750 with a 25% profit ($5/4$ of CP), then $CP = 8750 \times (4/5) = 7000$. If CP is 7000 after a 30% discount (70% of Labelled Price), then Labelled Price = $7000/0.7 = 10000$.

8. In a group of 25, 10 have studied French, 11 have studied Spanish, and 8 have not studied either. How many of these studied both French and Spanish?

- (A) 0
- (B) 4
- (C) 12
- (D) 6

Correct Answer: (B) 4

Solution:

Step 1: Understanding the Question:

This is a standard set theory problem. We are given the total number of people, the number of people in two individual sets, and the number of people outside both sets. We need to find the intersection of the two sets.

Step 2: Key Formula or Approach:

Use the principle of inclusion-exclusion for two sets:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

Where $n(A \cup B)$ is the number of people who studied at least one of the subjects, which can be found by subtracting the "neither" group from the total group.

Step 3: Detailed Explanation:

Let F be the set of people who studied French, and S be the set of people who studied Spanish.

Total number of people in the group = 25.

Number of people who studied neither = 8.

Number of people who studied at least one language $n(F \cup S) = 25 - 8 = 17$.

We are given: $n(F) = 10$

$n(S) = 11$

Substitute these values into the inclusion-exclusion formula:

$$17 = 10 + 11 - n(F \cap S)$$

$$17 = 21 - n(F \cap S)$$

$$n(F \cap S) = 21 - 17 = 4$$

Therefore, 4 people studied both French and Spanish.

Step 4: Final Answer:

The number of people who studied both is 4.

Quick Tip: Drawing a Venn diagram helps visualize the problem instantly. The sum of the individual groups plus the "neither" group minus the intersection must equal the total population: $10 + 11 + 8 - x = 25 \Rightarrow 29 - x = 25 \Rightarrow x = 4$.

9. Sita, Rita, Gita and Latha are 4 Sisters. If the following statements are all true, who among them is the youngest?

- (i) Sita is the oldest.
- (ii) Latha is not the oldest.
- (iii) Gita is younger to Rita
- (iv) Gita is not the youngest

- (A) Sita
- (B) Latha
- (C) Gita
- (D) Rita

Correct Answer: (B) Latha

Solution:

Step 1: Understanding the Question:

We need to determine the age order of four sisters based on a set of logical statements to find the youngest one.

Step 3: Detailed Explanation:

Let's analyze the statements step-by-step to rank them from oldest (1st) to youngest (4th):

- **Statement (i):** "Sita is the oldest."
This places Sita firmly in the 1st position.
- **Statement (ii):** "Latha is not the oldest."
Since we already know Sita is the oldest, this statement is consistent but doesn't immediately give a new position for Latha.
- **Statement (iii):** "Gita is younger to Rita."
This means Rita is older than Gita. Since Sita is 1st, Rita and Gita must occupy some

combination of 2nd, 3rd, or 4th places, with Rita always ahead of Gita.

- **Statement (iv):** "Gita is not the youngest."

This means Gita cannot be in the 4th position.

Now let's synthesize: Sita is 1st. Gita must be younger than Rita, so Gita cannot be 2nd (because then Rita would have to be 1st, which is taken by Sita). Therefore, Rita must be 2nd and Gita must be 3rd. The only remaining position is the 4th (youngest) position, and the only sister left to place is Latha.

So the final order from oldest to youngest is: Sita, Rita, Gita, Latha.

Thus, Latha is the youngest.

Step 4: Final Answer:

Latha is the youngest sister.

Quick Tip: For sequence puzzles, creating a visual ranking array like [1: Sita, 2: _, 3: _, 4: _] and filling it iteratively by eliminating impossible slots for each person is the most reliable method.