

MCTC – 2022

MATH-n-CODING TECH COMPETITION

Syllabus Group 3

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1. Areas & Volumes

The **area** refers to the region covered by the object. And **volume** refers to the quantity or capacity of the object. An **area** is a two-dimensional object whereas **volume** is a three-dimensional object. The **area** is a plain figure while **volume** is a solid figure.

Example 1

Question - The length and breadth of a rectangle are $(3a + 2)$ and $(2a - 1)$. Which of the following represents its perimeter?

- A) $2(5a - 1)$
- B) $(5a + 1)$
- C) $(5a - 1)$
- D) $2(5a + 1)$

Answer – D

$$\text{Perimeter} = 2[3a + 2 + 2a - 1] = 2[5a + 1]$$

Example 2

Question – If a cone is cut parallel to the base of it by a plane in two parts, then the shape of the top of the cone will be _____

- A) Sphere
- B) Cube
- C) Cone itself
- D) Cylinder

Answer – C

If we cut a cone into two parts parallel to the base, then the shape of the upper part remains the same.

2. Coding-Decoding

Coding is a process used to encrypt a word, a number in a particular code or pattern based on some set of rules. Decoding is a process to decrypt the pattern into its original form from the given codes.

Includes

Alpha-numeric sequence, ranking sequence, time sequence etc.

Example 1

Question – In a certain code, 'RATIONAL' is written as 'ARITNOLA'. How would 'TRIBAL' be written in that code?

- A) RTIALB
- B) TIRALB
- C) RTBILA
- D) TIRABL

Answer – C

'TRIBAL' is coded as TIRLBA in the same way as 'RATIONAL' is coded a 'RTANIOLA'.

Example 2

Question – If E = 5, PEN = 35, then PAGE = ?

- A) 27
- B) 28
- C) 36
- D) 29

Answer – D

Clearly, putting A=1, B=2, C=3, D=4 E=5..., M=13 ...X=24, Y=25, Z=26,
We have: PEN = P+E+N = 16+5+14 = 35. So, PAGE = P+A+G+E = 16+1+7+5 = 29

3. Profit and Loss

Profit (P): The amount gained by selling a product with more than its cost price.

Loss (L): The amount the seller incurs after selling the product less than its cost price, is mentioned as a loss.

Example 1

Question – If a man were to sell his chair for Rs. 720, he would lose 25%. To gain 25% he should sell it for: _____

- A) Rs. 1,200
- B) Rs. 1,000
- C) Rs. 960
- D) Rs. 900

Answer – A

CP of chair = $100 / 75 \times 720 = \text{Rs. } 960$

To gain 25%, SP = $125 / 100 \times 960 = \text{Rs. } 1,200$

Example 2

Question – A TV is purchased at Rs. 5000 and sold at Rs. 4000, find the lost percent.

- A) 10%
- B) 20%
- C) 25%
- D) 28%

Answer – B

We know, C.P. = 5000, S.P. = 4000

Loss = $5000 - 4000 = 1000$

Loss % = $(\text{Loss} / \text{Cost} \times 100) \% = (1000 / 5000 \times 100) \% = 20\%$

4. Statistic & Probability

Statistics is the study of the collection, analysis, interpretation, presentation, and organization of data. Probability denotes the possibility of the outcome of any random event.

Example 1

Question – A batsman hits boundaries for 6 times out of 30 balls. Find the probability that he did not hit the boundaries.

- A) $1/5$
- B) $2/5$
- C) $3/5$
- D) $4/5$

Answer – D

Explanation: No. of boundaries = 6

No. of balls = 30

No. of balls without boundaries = $30 - 6 = 24$

Probability of no boundary = $24/30 = \frac{4}{5}$

Example 2

Question – If AM of $a, a+3, a+6, a+9$ and $a+12$ is 10, then a is equal to _____

- A) 1
- B) 2
- C) 4
- D) 3

Answer – C

Solution: Mean of AM = 10

$$(a+a+3+a+6+a+9+a+12) / 5 = 10$$

$$5a + 30 = 50, 5a = 20, a = 4$$



5. Basics of Computer

A computer program is a series of instructions (also called code) given to the computer to perform some tasks. *Mathematics is a fundamental scholarly tool in computing.*

Example 1

Question – When a key is pressed on keyboard, which standard is used for converting the keystroke into the corresponding bits?

- A) ANSI
- B) ASCII
- C) EBCII
- D) KEYST

Answer – B

Example 2

Question – A computer is accurate, but if the result of a computation is false, what is the main reason for it?

- A) Power failure
- B) The computer circuits
- C) Incorrect data entry
- D) Technical glitch

Answer – C



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Thank you!

