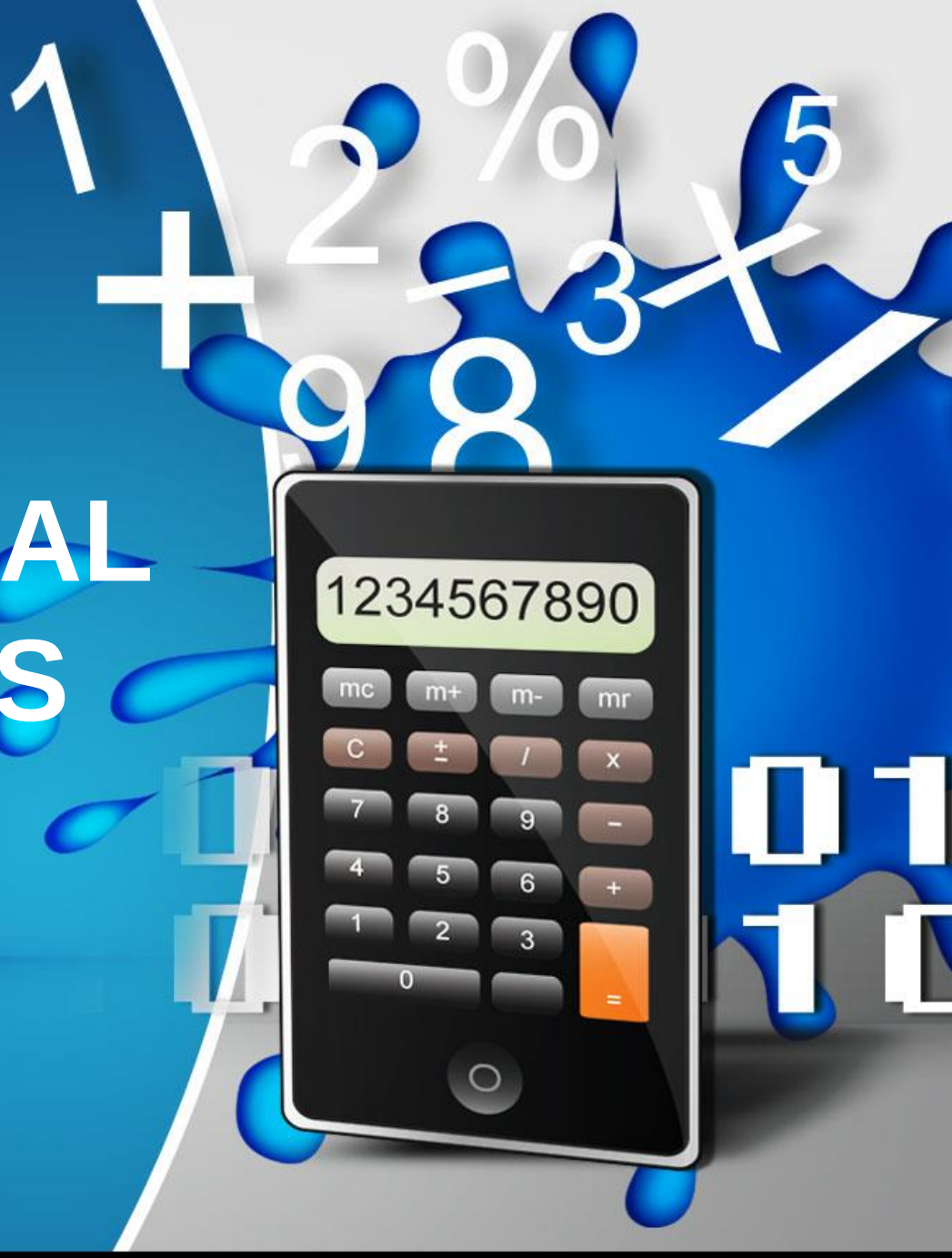
MATHEMATICAL OPERATIONS



TYPE 1 : PROBLEM-SOLVING BY SUBSTITUTION

- In this type, you are provided with substitutes for various mathematical symbols, followed by a question involving calculation of an expression or choosing the correct/incorrect equation.
- You are required to put in the real signs in the given equation and then solve the questions as required.
- While solving a mathematical expression, proceed according to some rules.

'BODMAS' Rule

This rule depicts the correct sequence in which the operations are to be executed, so as to find out the value of given expression.

Here B - Bracket,
O - of,
D - Division,
M - Multiplication,
A - Addition and
S - Subtraction

- Thus, in simplifying an expression, first of all the brackets must be removed, strictly in the order (), {} and ||.

- After removing the brackets, we must use the following operations strictly in the order:

  (i) of (ii) Division (iii) Multiplication (iv) Addition (v) Subtraction.

- ***Modulus of a Real Number:***

  Modulus of a real number *a* is defined as

  $|a| = a$, if $a > 0$ $-a$, if $a < 0$

  Thus, $|5| = 5$ and $|-5| = -(-5) = 5$.

Virnaculum (or Bar):

When an expression contains Virnaculum, before applying the 'BODMAS' rule, we simplify the expression under the Virnaculum.

Question

- If ‘+’ means ‘minus', ‘x’ means ‘divided by', ‘/’ means ‘plus' and ‘-’ means 'multiplied by', then which of following will be the value of expression 252 x 9 – 5 + 32 / 92 ?

  (a) 95

  (b) 168

  (c) 192

  (d) 200

  (e) None of these

Solution

- Putting the proper signs in expression, we get :

  252 / 9 x 5 – 32 + 92

  = 28 x 5 – 32 + 92

  = 140 -32 + 92

  = 232 – 32 = 200

  – So. the answer is (e).

Question

- If Q means ‘add to’, J means ‘multiply by’, T means ‘subtract from’ and K means ‘divide by’, then

  30 K 2 Q 3 J 6 T 5 = ?

Solution

- By using the correct symbols, we have :

  Given expression :

  30 / 2 + 3 x 6 - 5

  = 15 + 3 x 6 – 5

  = 15 + 18 - 5 = 33 – 5 = 28.

TYPE 2 : INTERCHANGING OF SIGNS & NUMBERS

Question

- If the given interchanges namely :

  signs + & / and numbers 2 & 4 are made in signs and numbers, which one of the following four equations would be correct ?

  (a) 2 + 4 / 3 = 3

  (b) 4 + 2 / 6 = 1.5

  (c) 4 / 2 + 3 = 4

  (d) 2 + 4 / 6 = 8

Solution

- Interchanging (+ & /) and (2 & 4), we get :

(a) 4 / 2 + 3 = 3 or 5 = 3 which is false.

(b) 2 / 4 + 6 = 1.5 or 6.5 = 1.5 which is false.

(c) 2 + 4 / 3 = 4 or 10 / 3 = 4 which is false.

(d) 4 / 2 + 6 = 8 or 8 = 8 which is true.

Hence, answer is D.

Question

- Which of the following meaning of the arithmetical signs will yield the value ‘zero’ for the expression given below ?

  200 x 100 + 300 x 200 – 10 / 2 + 40

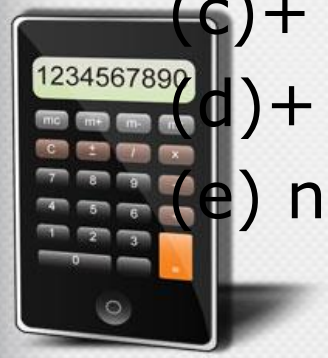
  (a)+ means -, - means x, x means /, / means +

  (b)+ means -, - means /, x means +, / means x

  (c)+ means x, - means -, x means /, / means +

  (d)+ means /, - means +, x means -, / means x

  (e) none of these



Solution

- By using the operations given in (b), we get the following expression as :

  200 + 100 – 300 + 200 / 10 x 2 – 40

= 200 + 100 – 300 + 20 x 2 – 40

= 200 + 100 – 300 + 40 – 40

= 340 – 340 = 0

Hence, answer is B.

LOGICAL SEQUENCE OF WORDS

- In this type of questions, a group of words is given. The candidate is required to arrange these words in a meaningful order such as the sequence of occurrence of events, sequence from a part to the whole, sequence of increasing/decreasing size, value, intensity etc., and then choose the correct sequence accordingly.

Question

- Arrange the following in a meaningful sequence :

1. Consultation 2. Illness 3. Doctor

4. Treatment 5. Recovery

(a) 2,3,1,4,5

(b) 2,3,4,1,5

(c) 4,3,1,2,5

(d) 5,1,4,3,2

Solution

- Answer : A

Question

- Arrange the following in a meaningful order, from particular to general :

1. Family 2. Community 3. Member

4. Locality 5. Country

(a) 3,1,2,4,5

(b) 3,1,2,5,4

(c) 3,1,4,2,5

(d) 3,1,4,5,2

Solution

- Answer : A

Question

- Arrange the following in a meaningful order:

1. Study 2. Job 3. Examination

4. Earn 5. Apply

(a) 1,2,3,4,5

(b) 1,3,2,5,4

(c) 1,3,5,4,2

(d) 1,3,5,2,4

Solution

- Answer : D

ARITHMATIC REASONING

TYPE 1 : CALCULATION-BASED PROBLEMS

Question

- In a chess tournament each of six players will play every other player exactly once. How many matches will be played during the tournament ?

  (a) 12

  (b) 15

  (c) 30

  (d) 36

Solution

- Answer : B

  We will consider the following matches :

  (i) matches of first player with other 5 players;

  (ii) matches of second player with 4 players other than the first player;

  (iii) matches of t h i rd player with 3 players other than the first and second players;

  (iv) matches of fourth player with 2 players other than the first three players; and

  (v) match of fifth player with the sixth one.

- So, number of matches played during the tournament = 5 + 4 + 3 + 2 + 1 = 15.

Question

- A man has a certain number of small boxes to pack into parcels. If he packs 3, 4, 5 or 6 in a parcel, he is left with one over, if he packs 7 in a parcel, none is left over. What is the number of boxes, he may have to pack ?

(a) 106 (b) 301 (c) 309 (d) 400

Solution

- The required number would be such that it leaves a remainder of 1 when divided by 3, 4, 5 or 6 and no remainder when divided by 7. Such a number is 301.
- Hence, the answer is (b).

Question

- In a group of cows and hens, the number of legs are 14 more than twice the number of heads. The number of cows is

(a) 5

(b) 7

(c) 10

(d) 12

Solution

- Let the number of cows be x and the number of hens be y. Then, number of legs in the group = *4x + 2y.*

  Number of heads in the group = x + *y.*

  So, 4x + 2y - 2(x + y) = 14

  or *x = 7.*

  Number of cows = 7.

  Hence, the answer is (b).

TYPE 2 : PROBLEMS ON AGES

Question

- Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is Reena now ?

  (a) 6 years
  (b) 7 years
  (c) 8 years
  (d) 12 years

Solution

- Let Sunita's present age be *x years.*

  Then, Reena's present age = *2x years.*

  Three years ago, Sunita's age = (x - 3) and Reena's age = (2x - 3).

  So, (2x - 3) = 3(x - 3) or 2x – 3 = 3x - 9

  or *x* = *6.*

  Reena s present age = 2x = 12 years.

  Hence, the answer is *(d).*

Question

- The age of a father is twice that of the elder son. Ten years hence the age of the father will be three times that of the younger son. If the difference of ages of the two sons is 15 years, the age of the father is :

  (a) 50 years (b) 55 years

  (c) 60 years (d) 70 years

Solution

- Let the age of the elder son be *x.*

  Then, age of younger son = (x - 15); and age of the father = 2x.

  So, 2x + 10 = 3(x - 15 + 10) or

  2x + 10 = 3x - 15 or

  x = 25.

  Father's age = 2x = 50 years.

  Hence, the answer is (a).

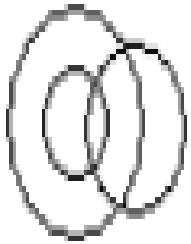
TYPE 3 : VENN-DIAGRAM BASED QUESTIONS

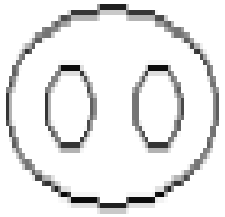
Introduction

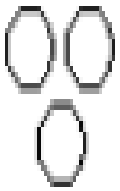
- The main aim of this section is to test your ability about the relation between some items of a group by diagrams. In these questions some figures of circles and some words are given. You have to choose a figure which represents the given words.

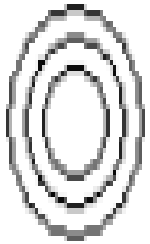
Question

Which of the following diagrams indicates the best relation between Women, Mothers and Engineers ?

A. 

B. 

C. 

D. 

Solution

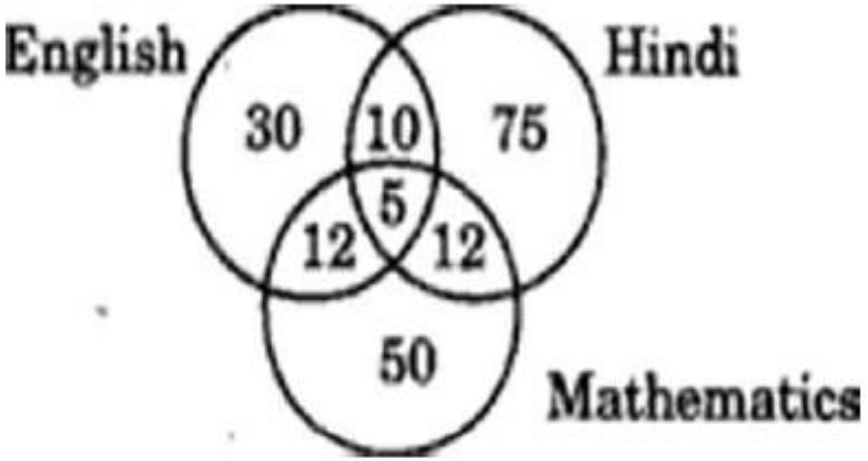
- **Answer:** Option **A**

  Explanation:

  All mothers are women and some mothers and some women may be engineers.

Question

Consider the diagram given below :



Five hundred candidates appeared in an examination comprising of tests in English, Hindi and Mathematics. The diagram gives the number of candidates who failed in different tests. What is the percentage of candidates who failed in at least two subjects ?

(a) 0.078 (6) 1.0 (c) 6.8 (d) 7.8

Solution

- Number of candidates who failed in at least two subjects

  = number of candidates who failed in two or more subjects

  = (10 + 12+ 12+ 5) = 39.

  Required percentage =(39 / 500 x 100) %

  = 7.8%.

Hence, the answer is (d).

THANK YOU