1. A student first reduced a certain number by 20% and then increased it again by 20%. If the difference between the last number and the original number was 8, then the original number was:

(A) 200
(B) 250
(C) 300
(D) 450
(E) 400

2. A car going at 40 miles per hour set out on an 80-mile trip at 9:00 A.M. Exactly 10 minutes later, a second car left from the same place and followed the same route. How fast, in miles per hour, was the second car going if it caught up with the first car at 10:30 A.M.?

(A) 45
(B) 50
(C) 53
(D) 55
(E) 60

3. In 1950, Richard was 4 times as old as Robert. In 1955, Richard was 3 times as old as Robert. In which year was Richard twice as old as Robert?

(A) 1960
(B) 1965
(C) 1970
(D) 1975
(E) 1980

4. A number, x is chosen at random from the set of positive integers less than 10. What is the probability that (9/x) > x?

(A) 1/5
(B) 2/9
(C) 1/3
(D) 2/3
(E) 7/9

5. If x/y = 3 and (a - x)/(b - y) = 3, then the value of a/b is?

(A) –3
(B) 3
(C) 2
(D) 1
(E) –2

6. If x and y are different integers, both divisible by 5, then which is not necessarily true?

(A) $x^2 + y^2$ is divisible by 5
(B) x - y is divisible by 5
(C) xy is divisible by 5
(D) x + y is divisible by 5
(E) x + y is divisible by 10

7. AB + CD = AAA, where AB and CD are two-digit numbers and AAA is a three digit number; A, B, C, and D are distinct positive integers. In the addition problem above, what is the value of C?

(A) 1
(B) 3
(C) 7
(D) 9
(E) Cannot be determined

8. A and B ran a race of 480 m. In the first heat, A gives B a head start of 48 m and beats him by 1/10 th of a minute. In the second heat, A gives B a head start of 144 m and is beaten by 1/30 th of a minute. What is B's speed in m/s?

(A) 12 (C) 16 (E) 20
(B) 14 (D) 18

9. A certain quantity of 40% solution is replaced with 25% solution such that the new concentration is 35%. What is the fraction of the solution that was replaced?

(A) 1/4 (C) 1/2 (E) 3/4
(B) 1/3 (D) 2/3

10. For bringing each copper coin from the bottom of a river, a coin-diver gets 20 cents, and for each brass coin he gets 25 cents. If after one dive, he got $2.80, what is the minimum number of copper coins that he brought?

(A) 4 (C) 2 (E) 0
(B) 3 (D) 1

11. A bag contains 3 red, 4 black and 2 white balls. What is the probability of drawing a red and a white ball in two successive draws, each ball being put back after it is drawn?

(A) 2/27 (C) 1/3 (E) 2/9
(B) 1/9 (D) 4/27

12. $252 is divided among A, B and C so that for every $2 that A receives, B receives $5 and for every $3 that B receives, C receives $7. Find the share of A?

(A) 15 (C) 17 (E) 23
(B) 20 (D) 27

13. The sum of the reciprocals of two numbers is 46/21 and the difference of their reciprocals is 10/21. What are the 2 numbers?

(A) 3, 3/29 (C) 4/3, 6/7 (E) 1/21, 1/21
(B) 3/4 , 7/6 (D) 8/21, 5/21

14. The Brooklyn Store of Washington Street raised the price of all items by exactly 25% and then on the very next day, they declared a discount of 12% on all items. Which of the following could NOT be the resulting price of the items?

(A) $5.50
(B) $7.60
(C) $11.00
(D) $12.10
(E) $75.90

15. The Bryant's flower shop situated at the New Plaza complex stocks four types of flowers. There are 1/3 as many violets as carnations, and 1/2 as many tulips as violets. If there are equal no. of roses and tulips, what percent of the flowers in the shop are carnations?

(A) 6.25
(B) 20
(C) 33
(D) 50
(E) 60

16. In an election, 68% of the voters exercised their franchise. Of these, 48% were women. The number of males exercising their franchise was 53,040. How many eligible voters were there in all?

(A) 102,000
(B) 150,000
(C) 234,000
(D) 252,000
(E) 288,000

17. The difference between a number and its square is 380. Find the number.

(A) 20
(B) 25
(C) 27
(D) 30
(E) 35

21. The sum of all 3 digit numbers which can be formed from the digits 1, 2 and 3 is:

(A) 1232
(B) 1248
(C) 1332
(D) 1356
(E) 1532

18. Area of a right-angled triangle is doubled while the base is reduced to its half. What % increase occurs in its height?

(A) 300%
(B) 370%
(C) 150%
(D) 400%
(E) 510%

Question # 1
Actual Answer : A

Explanation
Let the number be Y .
It is first reduced by 20% .
Now the new number is Y – Y(20/100) = 0.8Y .
The new number is then increased by 20%, we get,
0.8Y + 0.8Y(20/100) = 0.96Y
Now, according to question ,
Y – 0.96Y = 0.04Y = 8 , Hence, Y = 200 .

Question # 2
Actual Answer : A

Explanation
Till 10:30 A.M ,.
the first car going at 40 mph has travelled for 1 1/2 or 3/2 hrs ,
and has therefore covered (40*3/2) = 60 miles .
Let the speed of the second car be x mph .
Till 10:30 A.M ,.
it has travelled for 1 hr 20 mins or 1 1/3 hrs or 4/3 hrs .
It has thus covered (4x/3) miles .
Since the two cars meet at 10.30 A.M., they have covered the same distance from the starting point .
Therefore, (4x/3) = 60
Therefore, x = 45

Question # 3
Actual Answer : C

Explanation
In 1950, let Robert's age be x yrs .
Then, Richard's age is 4x yrs .
In 1955, their ages are (x + 5) and (4x + 5) yrs respectively .
Since in 1955, Richard was 3 times as old as Robert, 3(x + 5) = 4x + 5 .
Solving, we get x = 10 .
Thus, Robert was 10 and Richard 40 in 1950 .
Now, using the process of elimination, you can derive that in 1970, their ages would be 30 and 60 respectively
(by adding 20 - the number of years between 1950 and 1970 - to their ages).

Question # 4
Actual Answer : B

Explanation
At first, this question may appear daunting, but it is not as difficult as it looks .
x can be any number from 1 to 9, and putting these values in the inequality (9/x) > x , it is not difficult to figure out that the inequality is true only for x = 1 and x = 2 .
At x = 3, the equation becomes (9/3) = 3 and for x > 3, the inequality becomes (9/x) < x .
Thus, the inequality (9/x) > x is true only in 2 of the 9 cases, and so the required probability is 2/9.

Question # 5
Actual Answer : B

Explanation
This question appears very tricky and unsolvable at the first look .
The best method in such questions is to try working on simplifying the equation .
In this question, x/y = 3 and (a - x)/(b - y) = 3
This means x/y = (a - x)/(b - y (
Or x(b - y) = (a - x)y
Simplifying, bx – xy = ay – xy
bx = ay , a/b = x/y
But x/y = 3 ,
thus a/b = 3

Question # 6
Actual Answer : E

Explanation
If x and y are divisible by 5, then , Let x = 5a and y = 5b ,
From first choice, we get $x^2 + y^2 = (5a)^2 + (5b)^2 = 25(a^2 + b^2)$ which will be divisible by 5 .
Similarly from second option, we get x - y = 5a - 5b = 5(a - b), which is divisible by 5 .
From third option, we get xy = 5a * 5b = 25ab, which is divisible by 25 .
Similarly from fourth option, we have x + y = 5a + 5b = 5(a + b) which is divisible by 5.
However, the last option gives x + y = 5a + 5b = 5(a + b) which is not necessarily divisible by 10 .

Question # 7
Actual Answer : D

Explanation
Since AB and CD are both two-digit numbers, AAA < 199. (Since the maximum possible sum of two 2-digit numbers is 198) Therefore, AAA = 111 => A=1 . Or 1_ + _ _ = 111 , Or 1B + C D = 111
Now, B can have any value between 2 and 9 .
0 and 1 are not possible values ,
as with B = 0, 10 added to a two digit number cannot be 111 .
B can't be 1 as A is already equal to 1 and A and B have to be different numbers.
Now, if B is 2, AB becomes 12 and 111-12 = 99 is the value of CD.
Now, if B = 9, AB becomes 19 and 111-19 = 92 is the value of CD.
Thus CD can have a value between 92 and 99.
In all cases the first digit, C is 9.
Thus C can only be equal to 9.

Question # 8
Actual Answer : A

Explanation
Let speed of A be 'a' m/s and speed of B, 'b' m/s .
In the first heat ,
Equating the time for which the two run, we get ,
a/480 = [(480 – 48)/b] – 60/10
Or, (480/a) = 432/b – 6 .....(1)
In the 2nd heat , (a/480) – (1/30) * 60 = (480 – 144)/b
Or, (480/a) = 336/b + 2 .....(2)
Solving (1) and (2) , we get b = 12.

Question # 9
Actual Answer : B

Explanation
If 1 be the total quantity of the liquid and n be the fraction replaced.
Then, (1 – n)* 40 + n*25 = 35 , 15n=5 , n = 1/3.

Question # 10
Actual Answer : A

Explanation
If C be the number of copper coins and B the number of brass coins. Then,
0.20C + 0.25B = 2.80 , But there is no further information provided.

You should have been able to identify that this is not a regular simultaneous equation problem, with two variables, because:
a) You can make just one equation with two variables AND
b) The question does not ask for the exact number of copper coins but for a minimum number of them.
You have to work with some logic in this question, 0.20C + 0.25B = 2.80
Since minimum number of C must be found . Let us see what is the maximum number of B that would satisfiy this equation, giving a whole number value to C.
If B is 11, the value of Brass coins would be $2.75 .
And Copper coins worth $ 0.05 would be needed, which is not possible, as the value of one copper coin is $0.20 .
If B is 10, 0.25B = 2.50; 0.20C = 0.30 and C = 1.5, which cannot be possible, the value of C should be a whole number.
If B is 9, 0.25B = 2.25; 0.20C = 0.55 and C = 2.75, which also cannot be possible.
If B is 8, 0.25B = 2.00; 0.20C = 0.80 and C = 4. Which is possible and is the least possible value of C. Thus there are a minimum of 4 copper coins.

Question # 11
Actual Answer : D

Explanation
Probability of a desired outcome = Number of favourable outcomes / Total number of possible outcomes .
There are a total of 9 balls in the bag. 3 out of the total 9 balls are red. Probability of drawing a red ball = 3/9
The one ball that is drawn is returned back into the bag and another ball is drawn. Now, 2 out of the total 9 balls are white. Probability of drawing a white ball = 2/9.
Hence probability of drawing a red and a white ball in two successive draws = 3/9 * 2/9 = 1/3 * 2/9 = 2/27.
The order in which the ball is drawn is not specified. It could be a red ball first or it could be a white ball first. Hence the probability will be 2/27 + 2/27 = 4/27 .

Question # 12
Actual Answer : D

Explanation
According to the question, A : B = 2 : 5 and B : C = 3 : 7
To find the share of any of the three, we need to see how the shares of all the three are related . We use the tripple ratio technique. We have two ratios with B as the common element in the two ratios . Making the value of B to be the same in both the ratios , we shall be able to find a tripple ratio that defines the relation between all the three together . We multiply the first ratio by 3 and the second by 5. The two ratios now become - A : B = 6 : 15 and B : C = 15 : 35 .
Now, the two ratios can be combined and written as , A : B : C = 6 : 15 : 35
A's share can now be written as 6/(6 + 15 + 35) of the total =6/56 of 252 or $27.

Question # 13
Actual Answer : B

Explanation
Let the two numbers be x and y.
Their reciprocals are 1/x and 1/y.
Sum of the reciprocals, 1/x + 1/y = 46/21
Difference of the reciprocals, 1/x – 1/y = 10/21
For such questions where both equations formed are of reciprocals ,
the thumb rule to be followed should be to convert them into new variables .
Let 1/x = a and 1/y = b, this converts the complex equations into two simple equations .
The two equations now are: a + b = 46/21 and a – b = 10/21.
Adding the two equations we get 2a = 56/21
Or, a = 28/21 = 4/3 .
Putting this value in the above equations, we get b = 6/7 .
Therefore, x = 3/4 and y = 7/6 .

Question # 14
Actual Answer : B

Explanation
If the initial price of any item is 'n' dollars ,
then the price after the 25% increase would be $1.25n,
and after the 12% decrease it would be (1.25 * 0.88) = $1.1n .

Hence, the resulting price has to be a multiple of 1.1
Of the given options, 7.6 is not a multiple of 1.1 and hence cannot be the resulting price.

Question # 15
Actual Answer : E

Explanation
The quickest way of getting this :
Assume that there are 300 carnations
(Choosing 300 makes 1/3rd of 300 equal to 100, which is an easy number to work with).

Then, you have 100 violets, 50 tulips, and 50 roses .
So, there are 300 carnations out of a total of 500, which is 60 percent.

Question # 16
Actual Answer : B

Explanation
Let the number of eligible voters be x .
Number of people who voted = 0.68x
Of those who voted, 48% were women, or the balance 52% were men .
Thus number of men who voted = 0.52 * 0.68x
Then (0.52) * (0.68x) = 53,040 .
Hence x = 150,000.

Question # 17
Actual Answer : A

Explanation
Let the number be x . Its square is x^2 . Their difference is 380.
Thus $x^2 - x = 380$
Or, $x^2 – x – 380 = 0$
Solving , we get x = 20, or x = –19 .
So, the number can be either -19 or 20 .
Looking at the options , 20 is the only available option.

Question # 18
Actual Answer : C

Explanation
Let us find all the three digit numbers that cab be formed by 1, 2 & 3
The numbers are 123, 132, 231, 213, 321 and 312 . Their sum is 1332.

Question # 19
Actual Answer : A

Explanation
Area of a triangle is ½ (base) (height)
Let A be the old area of the triangle and b and h be the old base and old height respectively .
Then A = ½ bh. Let new height be h1, new base is b/2 and the new area is 2A.
Now, 2A = ½ (b/2)(h1)
From the two equations we get ,
2(½ bh) = ½ (b/2)(h1).
Hence h1 = 4h .
The percentage change in height is
[(h1 – h)/h] x 100 = 300%