**Quantitative aptitude (set 1)**

**Company name: HCL No. of Question: 15**

**1:**

Sita scored equal marks in English and Maths in an examination. Ratio between the marks obtained by her in English and science is 2:3. If she scored an aggregate of 70%, find the number of subjects in which she scored equal to or less than 60% if the maximum marks in each subject is the same.

1. 1
2. 2
3. 3
4. 0

**Answer :** option b

**Solution:**

Let the marks obtained in English, Maths and Science be e, m and s, respectively. Also, let the maximum marks in each subject be T. Now, according to the question,

e = m = 2s/3

Since the aggregate is 70%

70/100 = (e + m + s)/3T

⇒ 7/10 = (e + e + 3e/2)/3T

⇒ e/T = 3/5

⇒ e/T = m/T =3/5 = 60% and s/T = (3/2)(3/5) = 90%

Hence, she scored 60% and below in English and Maths alone.

**2:**

The average of two consecutive natural numbers is n. If two more consecutive numbers are taken (along the increasing order), find the average of the four numbers.

1. n + 1/2
2. n + 3/2
3. n + 1
4. n + 2

**Answer :** option c

**Solution:**

Let the four numbers be k, k + 1, k + 2 and k + 3. Now, according to the question average of the first two numbers is n. That is,

⇒ k + (k + 1)/2= n

Now, average of all the four numbers is

= (k + k + 1 + k + 2 + k + 3)/4

= (4k + 6)/4

= k + 3/2

= k + ½ + 1

= n + 1

**3:**

Find the LCM of 4/3, 8/15, 2/9, 16/27.

1. 8/9
2. 12
3. 16/3
4. 24

**Answer :** option c

**Solution:**

LCM of a fraction = (LCM of the numberators)/(HCF of the denominators)

Hence, LCM of 4/3, 8/15, 2/9, 16/27

= (LCM of 4, 8, 2, 16)/(HCF of 3, 15, 9, 27)

= 16/3

**4:**

Evaluate (5.75 × 5.75 × 5.75 – 5.25 × 5.25 × 5.25)/(5.75 × 5.75 + 5.75 × 5.25 + 5.25 × 5.25).

1. 0.25
2. 1.2
3. 0.005
4. 0.5

**Answer :** option d

**Solution:**

(5.75 × 5.75 × 5.75 – 5.25 × 5.25 × 5.25)/(5.75 × 5.75 + 5.75 × 5.25 + 5.25 × 5.25)

= (5.753 – 5.253)/(5.752 + 5.75 × 5.25 + 5.252)

= (5.75 – 5.25)(5.752 + 5.75 × 5.25 + 5.252)/(5.752 + 5.75 × 5.25 + 5.252) [ since a3 – b3 = (a – b) (a2 + ab + b2)]

= 5.75 – 5.25

= 0.5

**5:**

If pqrs = 625, find the least value of p + q + r + s.

1. 20
2. 12
3. 16
4. 24

**Answer :** option a

**Solution:**

We know that Arithmentic Mean (AP) ≥ Geometric Mean (GM)

Therefore

(p + q + r + s)/4 ≥ (pqrs) (1/4)

⇒ (p + q + r + s)/4 ≥ (625) (1/4)

⇒ (p + q + r + s)/4 ≥ 5

⇒ p + q + r + s ≥ 20

**6:**

If √x + 1/√x = 3, then find the value of x2 + 1/x2.

1. 41
2. 42
3. 46
4. 47

**Answer :** option d

**Solution:**

Given √x + 1/√x = 3

Squaring both sides, we get

x + 1/x + 2 = 9 [since (a + b)2 = a2 + b2 +2ab]

⇒ x + 1/x = 7

Squaring both sides again, we get

x2 + 1/x2 + 2 = 49

⇒ x2 + 1/x2 = 47

**7:**

Saral, Ravi and Karan take 10, 12 and 15 days, respectively, to complete a task alone. All of them began working together, but Saral left 2 days after the start of the work and Ravi 3 days before the completion of the task. Find the number of days taken to complete the task.

1. 8
2. 7
3. 6
4. 4

**Answer :** option b

**Solution:**

Work done per day by Saral = 1/10 units

Work done per day by Ravi = 1/12 units

Work done per day by Karan = 1/15 units

Let the number of days taken to complete the task be x. We have,

2/10 + (x – 3)/12 + x/15 = 1

⇒ 27x/180 = 21/20

⇒ x = 7 days.

**8:**

P, Q and R run on a circular track of 1000m with speeds 35m/s, 24m/s and 22m/s, respectively. When will they meet for the first time? (in seconds)

1. 800
2. 1200
3. 1000
4. 2000

**Answer :** option c

**Solution:**

Time taken by P to meet Q for the first = distance to be covered between them/ relative velocity

= 1000/(35 – 24) = 1000/11 seconds

Time taken by P to meet R for the first time = distance covered between them/ relative velocity

= 1000/(35 - 22) = 1000/13 seconds

Hence, time taken for all the three to meet for the first time = LCM of 1000/11 and 1000/13

= LCMof 1000 and 1000/ HCF of 11 and 13

= 1000/1

= 1000 seconds.

**9:**

15 kg of a superior quality sugar is mixed with 35 kg of an inferior quality sugar. If the cost price of the superior quality sugar and inferior quality sugar are rupees 21 per kg and rupees 12 per kg, respectively, find the cost price per kg of the mixture in rupees.

1. 14.7
2. 12.7
3. 16.7
4. 13.7

**Answer :** option a

**Solution:**

The cost price per kg of the mixture

= (cost price of superior quality sugar × amount + cost price of inferior quality of sugar × amount)/total amount

= (21 × 15 + 12 × 35)/50

= 14.7 rupees/kg.

**10:**

At 20% per annum, a principal amounts to rupees 20736 in 3 years at compound interest. Find the principal amount in rupees.

1. 18000
2. 12000
3. 16000
4. 14000

**Answer :** option b

**Solution:**

Amount A a principal P amounts to in n years at R%per annum compound interest is given by the relation

A = P(1 + R/100)n

Here, A = 20736, R = 20 and n = 3, Therefore,

A = P(1 + R/100)n

⇒ 20736 = P(1 + 20/100)3

⇒ 20736 = P(6/5)3

⇒ 20736 = P(6/5)3

⇒ P = 12000 rupees.

**11:**

A shopkeeper loses selling prices of 2 pens by selling 18 pens. Find his loss percentage.

1. 8
2. 12
3. 16
4. 10

**Answer :** option d

**Solution:**

Let the cost price of a pen be x and its selling price. Now, according to the question, loss is equal

to selling price of 2 pens when 18 of them are sold. That is

loss = 2s = 18x – 18s

⇒ 20s =18x

⇒ 2s = 1.8x

Loss percentage = (cost price – selling price)/(cost price) × 100

= 2s/18x × 100

= 1.8/18 × 100

= 10%

**12:**

A person sells two chairs, one at 10% profit and the other at a loss of 10%. If the selling price of both the chairs are rupees 4000, find the net profit/loss percentage incurred in the transaction?

1. 10% loss
2. 2% profit
3. 1% loss
4. 11% profit

**Answer :** option c

**Solution:**

Since the selling price of both the chairs are the same, we can use the standard formula for such cases. When two items are sold at the same selling price, one at loss and other at a profit with percentage loss and percentage gain are both the same, the net result is a loss and the loss percentage is given by,

(gain/loss percentage/10)2 %

= (10/10)2 %

= 1% loss

**13:**

A and B are 25% and 40% shorter than C. How much percentage is the height of B compared to that of A?

1. 80
2. 72
3. 86
4. 54

**Answer :** option a

**Solution:**

Let the heights of A, B and C be a, b and c, respectively. Now according to the question

a = 0.75c and b = 0.6c

Therefore,

Required percentage = (b/a) × 100

= (0.6/0.75) × 100

= 6000/75

= 80%

**14:**

PQR is a right angled triangle with right angle at P. A line segment AB intersecting PQ at A and PR at B is parallel to the hypotenuse QR. Find the area of triangle PQR if AB is 75% of QR and the area of triangle APB is 90cm2? ( in cm2)

1. 80
2. 120
3. 160
4. 240

**Answer :** option c

**Solution:**

Since triangle APB is similar to triangle QPR, we have,

ratio of the areas = ratio of the square of sides

Therefore,

Area of triangle APB/area of triangle QPR = (AB/QR)2 = (75/100)2 = 9/16

Therefore, area of triangle PQR = (16/9)(90) = 160cm2.

**15:**

In a triangle ABC, the length of the sides are a, b and c. If it is known that a2 + b2 + c2 = ab + bc + ca, then the triangle ABC is a/an?

1. Equilateral triangle
2. Isosceles triangle
3. Right triangle
4. Scalene trianlge

**Answer :** option a

**Solution:**

Given a, b and c are side lengths and a2 + b2 + c2 = ab + bc + ca

⇒ 2a2 + 2b2 + 2c2 = 2ab + 2bc + 2ca

⇒ a2 + b2 – 2ab + c2 + a2 – 2ca + b2 + c2 – 2bc = 0

⇒ (a – b)2 + (c – a)2 + (b – c)2 = 0

⇒ a = b = c

⇒ ABC is an equilateral triangle