

**Quiz Date: 16<sup>th</sup> May 2020**

**Directions (1 - 5):** Each question below is followed by two Statements [I] and [II]. You have to determine whether the data given in the statements are sufficient for answering the question. You should use the data and your knowledge of Mathematics to choose between the possible answers.

Give answer

- (a) if the Statement [I] alone is sufficient to answer the question but the Statement [II] alone is not sufficient
- (b) if the Statement [II] alone is sufficient to answer the question but the Statement [I] alone is not sufficient
- (c) if both Statement [I] and [II] together are needed to answer the question
- (d) if either the Statement [I] alone or Statement [II] alone is sufficient to answer the question
- (e) if you cannot get the answer from the Statements [I] and [II] together but need even more data

Q1. Ram sold an item. Find the M.P of the item?

[I]. Ram gave two successive discounts of 20% & 5% on marked price but after that take 25% more on discounted price as tax. Ram can earn 40 more if he sell the item at MP.

[II] .Ram gave two successive discount of MP i.e., 15% & 20% whereas Ram kept M.P. 50% more than the C.P. of that item.

Q2. Find the amount invested by Jagriti?

[I]. If jagriti invested half of the amount in Yes Bank at 5% p.a. for 3years and half the amount in Kotak Bank at 6% p.a. for 5 year, she got total Rs4500 as Simple Interest.

[II] . Jagriti will get 2420 more if she will invest in a bank at 10% p.a. for 3 year at compound interest rather than 10% p.a. for 2 year in same bank at compound interest

Q3. Whose body weight is second highest among the five boys Arun, Vinay, Suraj, Raju and Pratap?

I. Average weight of Arun, Suraj and Vinay is 68 kg and average weight of Raju and Pratap is 72 kg. Also Suraj is 78 kg. Raju is 68 kg and Vinay is 46 kg.

II. Average weight of Arun, Suraj, Vinay and Raju is 68 kg and also Suraj is 78 kg. Raju is 68 kg and Vinay is 46 kg. All of them have different weights.

Q4. What is the population of the city A?

I. The ratio of the population of males and females in city A is 27 : 23 and the difference between their population is 100000.

II. The population of city A is 80% of that of city B. The difference between populations of city A and city B is 312500.

Q5. How many students did participate in Singing?

I. The students who participated in dancing were 150% more than that who participated in Singing.

II. 150 students participated in dancing.

Q6. The ratio between radius of two hemispheres solid tin pieces is 2 : 3 and difference between volume of both is  $836/21 \text{ cm}^3$ . These two hemispheres are melted into a cylindrical vessel and used  $74\frac{\pi}{3} \text{ cm}^3$  extra tin material for polishing the vessel. If ratio between height & radius of cylindrical vessel is 3 : 4, then find the total surface area of cylindrical vessel?

- (a)  $154 \text{ cm}^2$
- (b)  $132 \text{ cm}^2$
- (c)  $176 \text{ cm}^2$
- (d)  $208 \text{ cm}^2$
- (e)  $198 \text{ cm}^2$

Q7. 20% increase in both radius and height of the cylinder increases the total surface area of cylinder by  $677.6 \text{ cm}^2$ , If the ratio of radius to height is 1 : 4, then find the radius of cylinder

- (a) 21 cm
- (b) 10.5 cm
- (c) 3.5 cm
- (d) 14 cm
- (e) 7 cm

Q8. A sphere is melted into 'n' number of small spheres. Total surface area of these small spheres is what percent more or less than total surface area of large sphere, if the ratio of radius of small sphere to radius of large sphere is 1 : 3.

- (a) 50%
- (b) 100%
- (c) 150%
- (d) 200%
- (e) 75%



Q9. Ratio of height of cylinder to that of diameter is 2: 3. This cylinder is formed by melting a sphere having same radius as the radius of circle. Ratio of magnitude of area of circle to magnitude of its circumference is 21: 2. Find height of cylinder.

- (a) 14 units
- (b) 21 units
- (c) 42 units

- (d) 28 units
- (e) 35 units

Q10. A Cone cylinder and hemisphere have equal radius and height. Find the ratio of total surface area of cylinder, cone and hemisphere.

- (a)  $4 : \sqrt{2} : \sqrt{6}$
- (b)  $4 : \sqrt{2} : 3$
- (c)  $\sqrt{2} + 1 : 4 : 3$
- (d)  $3 : 4 : \sqrt{2} + 1$
- (e)  $4 : \sqrt{2} + 1 : 3$

**Directions (11-15) :-**Data regarding investment of three different persons in three different schemes is given below. Study the data carefully and answer the following questions.

→ Out of total amount invested by 'Rahul' in all the three schemes, 25% is invested in scheme 'X'. Remaining amount is invested in scheme 'Y' and 'Z' equally.

→ 'Veer's' investment in scheme 'X' is 37.5% less than that of 'Anurag's' in same scheme.

Total amount invested by 'Rahul', 'Veer' and 'Anurag' in all the three schemes is in the ratio of 4 : 5 : 6. Ratio between amount invested by 'Veer' in scheme 'Y' to in 'Z' is 3 : 2. Amount invested by 'Veer' in scheme 'Y' is 80% more than that in scheme 'X'.

→ Amount invested by Anurag in scheme 'Y' and 'Z' together is Rs. 20,000 more than the amount invested by 'Rahul' in both the same schemes together. Amount invested by Anurag in scheme 'Y' is 200% more than that in scheme 'Z'.

Q11. Rate of interest on scheme 'X', 'Y' and 'Z' is 10%, 20% and 30% p.a. at Simple interest. Find total interest earned by Rahul after 2 years.

- (a) Rs. 44,000
- (b) Rs. 41,000
- (c) Rs. 34,000
- (d) Rs. 30,000
- (e) Rs. 24,000

Q12. Veer and Anurag both invested in scheme 'X'. After 8 months Veer withdraw his total amount while Anurag withdraw his total amount after 12 months. If total profit of both is Rs. 7,650 then find the profit share of Veer.

- (a) Rs. 2,250
- (b) Rs. 3,150
- (c) Rs. 4050
- (d) Rs. 4950
- (e) Rs. 6750

Q13. Total amount invested in scheme 'Y' by all three together is what percent more than total amount invested by all three in scheme 'Z' all together?

- (a) 50.25%

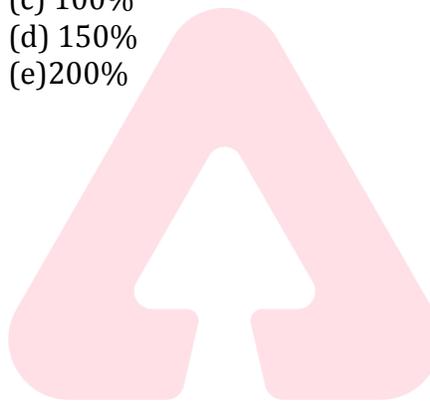
- (b) 56.75%
- (c) 62.75%
- (d) 68.75%
- (e) 72.25%

Q14. Find the ratio between amount invested by Veer on scheme 'X' to amount invested by Rahul in scheme 'Z'?

- (a) 4 : 3
- (b) 1 : 1
- (c) 2 : 3
- (d) 5 : 8
- (e) 5 : 6

Q15. Scheme 'Z' offers 20% p.a. at Compound interest. Find interest earned by Veer is what percent more than interest earned by Anurag in that scheme?

- (a) 75%
- (b) 50%
- (c) 100%
- (d) 150%
- (e) 200%



### Solutions

S1. Ans.(a)

Sol.

From Statement [I]

$$MP = x$$

$$\text{After two successive discounts} = \frac{80}{100} \times \frac{95}{100} \times x$$

$$= 0.76x$$

$$\text{Final S.P after taking tax} = \frac{125}{100} \times 0.76x$$

$$= 0.95x$$

According to question

$$MP - SP = 40$$

$$x - 0.95x = 40$$

$$0.05x = 40$$

$$x = 800$$

From statement [II]

Let, MP = x

$$S.P = \frac{85}{100} \times \frac{80}{100} \times x$$

$$= 0.68x$$

As, any value is not given so we can't find out the M.P.

∴ Hence, Statement [I] alone is sufficient to answer the question but the Statement [II] alone is not sufficient

S2. Ans.(d)

Sol.

From statement [I]

Let total amount = x

$$\frac{x}{2} \times \frac{5 \times 3}{100} + \frac{x}{2} \times \frac{6 \times 5}{100} = 4500$$

$$\frac{x}{2} \left[ \frac{15}{100} + \frac{30}{100} \right] = 4500$$

$$x = 20,000$$

From statement [II]

$$2420 = x \left[ 1 + \frac{10}{100} \right]^3 - x \left[ 1 + \frac{10}{100} \right]^2$$

$$2420 = x \times 1.1^3 - x \times 1.1^2$$

$$2420 = 1.331x - 1.21x$$

$$0.121x = 2420$$

$$x = 20,000$$

∴ Hence, Either statement [I] alone or statement [II] alone is sufficient to answer the question.

S3. Ans.(a)

Sol. From I,

$$A + S + V = 3 \times 68 = 204 \text{ kg}$$

$$R + P = 144 \text{ kg}$$

$$A \Rightarrow 204 - 46 - 78 = 80 \text{ kg}$$

$$P \Rightarrow 144 - 68 = 76 \text{ kg}$$

$$S = 78 \text{ kg}$$

From II,

$$A + S + V + R = 68 \times 4 = 272$$

$$S = 78 \text{ kg}, R = 68 \text{ kg}, V = 46 \text{ kg}$$

$$\therefore A = 272 - (78 + 68 + 46) = 80 \text{ kg}$$

$P = ?$ ,  $P$  cannot be determined

S4. Ans.(d)

Sol. From I

$$27x - 23x = 100000$$

$$x = 25000$$

Population of city A = 50x

$$= 1250000$$

From II

Population of city B = x

$$\text{Population of city A} = \frac{4x}{5}$$

$$x - \frac{4x}{5} = 312500$$

$$x = 1562500$$

$$\text{Population of city A} = \frac{4}{5} \times 1562500 = 1250000$$

S5. Ans.(c)

Sol. From I and II

Students participating in dance

$$= 150$$

$$\text{Students who participate in singing} = \frac{150 \times 100}{250} = 60$$

S6. Ans.(c)

Sol.

Let the radius of two hemisphere be  $2x$  &  $3x$

ATQ,

$$\frac{2}{3}\pi(3x)^3 - \frac{2}{3}\pi(2x)^3 = \frac{836}{21}\text{cm}^3 \quad [\because \text{volume of hemisphere} = \frac{2}{3}\pi r^3]$$

$$\Rightarrow \frac{2}{3}\pi[19x^3] = \frac{836}{21}$$

$$\Rightarrow x = 1$$

$\therefore$  radius are 2 cm & 3 cm.

Now,

$$\left[\frac{2}{3}\pi(2)^3 + \frac{2}{3}\pi(3)^3\right] + \left[\frac{74}{3}\pi\text{cm}^3\right] = \pi R^2 H$$

$$\Rightarrow \frac{2}{3}\pi[8 + 27] + \frac{2}{3}\pi 37 = \pi R^2 H$$

$$\Rightarrow \frac{2}{3}\pi[35 + 37] = \pi R^2 H$$

$$\Rightarrow R^2 H = 48$$

$$\Rightarrow R : H = 4 : 3 \text{ (given)}$$

$$\text{Let } R = 4a, H = 3a$$

$$\Rightarrow 16a^2 \cdot 3a = 48$$

$$a = 1$$

$$\therefore R = 4, H = 3$$

$$\text{T.S.A. of cylinder} = 2\pi R(R + H)$$

$$= 2 \times \frac{22}{7} \times 4(7)$$

$$= 176 \text{ cm}^2$$

S7. Ans (d)

Sol.

Let the radius and height of cylinder be are  $r$  &  $h$  respectively

Now 20% income in both mean

$$\text{new radius} = \left(1 + \frac{20}{100}\right) r = 1.2 r$$

Also 1.2h.

$$2\pi \times 1.2 r(1.2r + 1.2h)$$

$$44 \times 2\pi r (h + r) = 67760$$

$$r(h+r) = 245$$

Let radius and height be x and 4x

$$x \times 5x = 245$$

$$x = 7 \text{ cm}$$



S8. Ans.(d)

Sol.

Let the radius of large sphere is  $3x$  and small sphere is  $x$ .

Then if large sphere is melted into  $n$  small spheres.

$$\frac{4}{3}\pi(3x)^3 = n \frac{4}{3}\pi(x)^3$$

$$n = \frac{27x^3}{x^3} = 27$$

$$\text{Surface area of large sphere} = 4\pi(3x)^2 = 36\pi x^2$$

$$\text{Surface area of 27 small spheres} = 27 \times 4\pi(x)^2 = 108\pi x^2$$

$$\text{Required \%} = \frac{108\pi x^2 - 36\pi x^2}{36\pi x^2} \times 100$$

$$= 200\%$$

S9. Ans.(d)

Sol.

Let the radius of circle is  $R$

Atq,

$$\frac{\pi R^2}{2\pi R} = \frac{21}{2} \Rightarrow R = 21$$

Volume of sphere of same radius

$$= \frac{4}{3}\pi R^3$$

Let, radius of cylinder is  $r$  and height is  $h$

$$\frac{4}{3}\pi R^3 = \pi r^2 h$$

$$r^2h = \frac{4}{3} \times 21 \times 21 \times 21$$

$$= 4 \times 7 \times 21 \times 21$$

$$r^2h = 28 \times 21 \times 21 \quad \dots(i)$$

In question

$$h : D = 2 : 3 \quad [D \text{ is diameter of cylinder}]$$

$$h : r = 2 : 3/2$$

$$= 4 : 3$$

$$4x : 3x$$

Put this in equation (i)

$$36x^3 = 28 \times 21 \times 21$$

$$x^3 = 7 \times 7 \times 7$$

$$x = 7$$

$$\text{height} = 28 \text{ units}$$

S10. Ans.(e)

Sol.

Let ratio of cone, cylinder and hemisphere = r

Height = r (Because height of hemisphere is equal to its radius)

Required ratio  $\rightarrow$

$$2\pi r(r+h) : \pi r(\ell+r) : 3\pi r^2$$

$$\Rightarrow 4r : \sqrt{2}r+r : 3r$$

$$4 : \sqrt{2} + 1 : 3$$

**S (11-15):**

Total amount invested by 'Rahul', 'Veer' and 'Anurag' is in the ratio 4 : 5 : 6.

Let total amount invested by Rahul, Veer and Anurag in all the three schemes be  $16x$ ,  $20x$  and  $24x$

$$\text{Amount invested by Rahul in scheme 'X'} = \frac{25}{100} \times 16x = 4x$$

$$\text{Amount invested by Rahul in scheme 'Y' or 'Z'} = \frac{16x-4x}{2} = 6x$$

Let Amount invested by Veer in scheme Y and Z be  $3y$  and  $2y$  respectively

$$\text{Then amount invested by Veer in scheme X is} = \frac{3y}{180} \times 100 = \frac{5y}{3}$$

$$\text{Ratio between amount invested by Veer in scheme 'X', 'Y' and 'Z'} = \frac{5y}{3} : 3y : 2y \rightarrow 5 : 9 : 6$$

Amount invested by Veer in scheme 'X', 'Y' and 'Z' is  $5x$ ,  $9x$  and  $6x$  respectively.

$$\text{Amount invested by Anurag in scheme 'X'} = \frac{5x}{5} \times 8 = 8x$$

$$\text{Amount invested by Anurag in scheme 'Y' and 'Z' together} = 24x - 8x = 16x$$

$$\text{Amount invested by Rahul in scheme 'Y' and 'Z' together} = 12x$$

ATQ,

$$16x - 12x = 20,000$$

$$\Rightarrow x = 5,000$$

Total amount invested by Anurag in scheme 'Y' and 'Z' together = 80,000

Let amount invested by Anurag in scheme 'Z' = 'a'

Amount invested by Anurag in scheme 'Y' = 3a

$$\Rightarrow a + 3a = 80,000$$

$$\Rightarrow a = 20,000$$

	X	Y	Z
<b>Rahul</b>	20,000	30,000	30,000
<b>Veer</b>	25,000	45,000	30,000
<b>Anurag</b>	40,000	60,000	20,000

S11. Ans.(c)

Sol.

$$\text{Required interest} = \frac{20,000 \times 10 \times 2}{100} + \frac{30,000 \times 20 \times 2}{100} + \frac{30,000 \times 30 \times 2}{100} = 4,000 + 12,000 + 18,000$$

$$= \text{Rs } 34,000$$

S12. Ans.(a)

Sol.

Ratio between profit share of Veer and Anurag

$$\text{Veer} : \text{Anurag} \rightarrow 25,000 \times 8 : 40,000 \times 12 \rightarrow 5 : 12$$

$$\text{Profit share of Veer} = \frac{5}{17} \times 7650 = \text{Rs } 2,250$$

S13. Ans.(d)

Sol.

Total amount invested in scheme 'Y' = 30,000 + 45,000 + 60,000 = 1,35,000

Total amount invested in scheme 'Z' = 30,000 + 30,000 + 20,000 = 80,000

$$\text{Required \%} = \frac{1,35,000 - 80,000}{80,000} \times 100 = \frac{55,000}{80,000} \times 100 = 68.75\%$$

S14. Ans.(e)

Sol.

$$\text{Required Ratio} = \frac{25,000}{30,000} = \frac{5}{6}$$

S15. Ans.(b)

Sol.

$$\text{Interest earned by Veer} = 30,000 \times \left[1 + \frac{20}{100}\right]^2 - 30,000 = 13,200$$

$$\text{Interest earned by Anurag} = 20,000 \times \left[1 + \frac{20}{100}\right]^2 - 20,000 = 8,800$$

$$\text{Required \%} = \frac{13,200 - 8,800}{8,800} \times 100 = 50\%$$

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