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Mixed Maths Questions for IBPS PO Pre, IBPS Clerk, SBI PO Pre, SBI Clerk Exams

Directions: Read the following questions carefully and choose the right answer.

1. Saurav travels from Delhi to Patna. He stops at equidistant places, that is Kanpur, Allahabad and Gaya during his journey. He covers the first one-fourth distance at a speed of 60 km/hr, the second one-fourth distance at a speed of 30 km/hr, third one fourth distance at a speed of 40 km/hr the last one-fourth distance at a speed of 60 km/hr. However, while returning, his uniform speed is 60 km/hr and he stops only at Jaunpur, which is exactly at the mid-point between Delhi and Patna. What is the average speed (in km/hr) of Saurav during the whole journey, not considering his halt time?

A. 50.52   B. 55.25   C. 52.52

D. 53.25   E. None of these

2. In 2016 the ratio of salaries of Muskan and Babli was 2 : 3. The ratios of the salary of 2016 to that of the 2017, in the case of Muskan and Babli respectively, are 3 : 4 and 5 : 7. If this year i.e. 2017 the difference in their salaries is 2300, what is Babli's salary this year?

A. Rs. 5950   B. Rs. 6300   C. Rs. 3000

D. Rs. 2875   E. None of these

3. A man rows to a certain place(downstream) and comes back(upstream), but by mistake he covers 1/3rd more distance while coming back. The total time for this journey is 10 hours. The ratio of speed of boat to that of stream is 2: 1. If the difference between upstream and downstream speed is 12km/hr, then how much time will the man take to reach to starting point from his present position?

A. 35 minutes   B. 45 minutes   C. 60 minutes

D. 40 minutes   E. None of these

4. Water flows out at the rate of 20 m/min from a cylindrical pipe of radius 5 mm. Find the time taken to fill a conical tank whose diameter at the surface is 40 cm and depth 24 cm.

A. 14 min.   B. 12.8 min.   C. 10.2 min.

D. 15 min.   E. None of these

5. It takes 30 minutes to empty a half-full tank by draining it at a constant rate. It is decided to simultaneously pump water into the half-full tank while draining it. What is the rate at which water has to be pumped in so that it gets fully filled in 10 minutes?

A. 4 times the draining rate
B. 3 times the draining rate
C. 2.5 times the draining rate
D. 2 times the draining rate
E. None of these

6. The simple interest on a certain sum at 5% for 9 months is Rs. 10 greater than the simple interest on the same sum at the rate

of 3% for 14 months. What is the sum of interest in both the cases (i.e. total sum of interest)?

A. Rs. 130   B. Rs. 290   C. Rs. 120

D. Rs. 330   E. None of these

7. Two friends Peter and Harry want to start a online electronics business and the ratio of investment of Peter and Harry in online electronics business is 6 : 7. John joined them after six months by sharing an amount equal to Harry's share. At the end of year 30% profit was earned on total investment and it was equal to Rs. 102000. How much money was invested by John?

A. Rs. 72121.21   B. Rs. 70350.50   C. Rs. 40998.58

D. Rs. 34000   E. None of these

8. MRF tyre company manufacturing tube incurs a cost of Rs. 40 per tube. The number of tube sold in a month decreases by 20 for every Rs. 4 increase in the selling price. If when the selling price of each tube is Rs. 48, the number of tubes sold in a month is 600, find the maximum profit that the company can make in a month?

A. 20480   B. 25452   C. 12451

D. 48551   E. None of these

9. A boat can cover a distance of 75 Km downstream and 99 Km upstream in 'r' hours. When it rains the speed of stream is increased by 50% and due to low visibility the speed of boat is decreased by 25%. Now, it takes 6 hours to cover 54 Km downstream and 36 Km upstream. If the time taken by boat to

cover 81 Km in still water while raining is 4 hours 30 minutes, then find the value of 'r'.

A. 6   B. 7   C. 9

D. 8   E. None of these

10. A bag contains 8 black balls, 6 green balls, and some red balls. The probability of drawing a red ball and a black ball from the bag is 22/75. If a person draws 3 balls randomly from the bag then find the probability that at least 2 balls are of red colour.
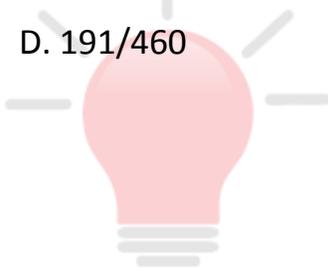
A. 121/320   B. 187/460   C. 97/460

D. 191/460   E. None of these

Correct answers:

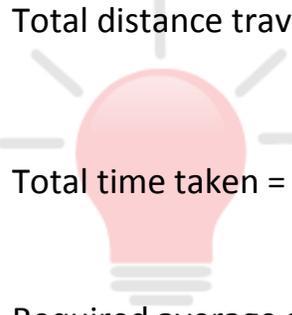| 1	2	3	4	5	6	7	8	9	10
A	B	D	B	A	B	A	A	D	B

Explanations:

1.

Suppose total distance between Delhi to Patna is x

Average speed = $\dfrac{\text{total distance travelled}}{\text{total time taken}}$

Total distance travelled during whole journey = 2x

Total time taken = $\dfrac{\frac{x}{4}}{60} + \dfrac{\frac{x}{4}}{30} + \dfrac{\frac{x}{4}}{40} + \dfrac{\frac{x}{4}}{60} + \dfrac{x}{60} = \dfrac{19x}{480}$

Required average speed = $\dfrac{2x}{\frac{19x}{480}}$ = 50.52 km/hr

Hence, option A is correct.

2.

Let a year ago i.e. in 2016 Muskan and Babli's salaries were x and y and now it is m and n respectively.

Given that,

$\dfrac{x}{y} = \dfrac{2}{3}$ ......(i)

$\underline{x} = \underline{3}$ ......(ii)

m   4

$$\frac{y}{n} = \frac{5}{7} \qquad \text{......(iii)}$$

From **(i)** and **(ii)**,

$$\frac{m}{y} = \frac{(2 \times 4)}{(3 \times 3)} = \frac{8}{9} \qquad \text{......(iv)}$$

From **(iii)** and **(iv)**

$$\frac{m}{y} = \frac{(8 \times 5)}{(9 \times 7)} = \frac{40}{63}$$

$$\frac{n}{m} = \frac{63}{40}$$

$$\frac{n}{m} - 1 = \frac{63}{40} - 1$$

$$\frac{n - m}{m} = \frac{63 - 40}{40}$$

$$\frac{n - m}{m} = \frac{23}{40} \qquad \text{.....(v)}$$

Also, given that (n – m) = 2300

Putting the value In equation **(v)**

$$\frac{2300}{m} = \frac{23}{40}$$

$$m = \frac{40 \times 2300}{23} = 4000$$

So, n = 4000 + 2300 = 6300

Hence, option B is correct.3.

3.

Speed of boat and stream be 2x and x respectively.

So downstream speed = 2x + x = 3x,

Upstream speed = 2x − x = x

Let total distance between points is d km

So he covered d km downstream,

While coming back i.e. upstream he covers $d + \dfrac{1}{3} \times d = \dfrac{4d}{3}$ km

Total time for this journey is 10 hrs.

$$\Rightarrow \dfrac{d}{3x} + \dfrac{4d}{3x} = 10$$

$\Rightarrow d = 6x$

Now also given, that (2x + x) − (2x − x) = 12

$\Rightarrow x = 6$

So, d = 36 km

Now to come to original point, he will have to cover $\dfrac{1}{3} \times 36 = 12$ km

And with speed 3x = 18 km/hr (downstream)

Hence, time is $\frac{12}{18} \times 60 = 40$ minutes

Therefore, option (D) is correct.

4.

Volume of cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times 20 \times 20 \times 24$

= 10057.14 cm^3

Radius of pipe = 5 mm

= 0.5 cm

Volume of water flowing out of the pipe per minute (in cm^3)

= 1000 × 0.5 × 0.5 × π

= 785 cm^3

Hence, time taken to fill the tank

$= \frac{10057.14}{785}$

= 12.8 minutes

Hence, option B is correct.

5.

Drainage pipe can drain complete tank in 60min.

Let the filling pipe can fill the tank in x min

Now, both are operational and tank is half filled

Also remaining half needs to get filled in 10 min

$$10 \left\{ \frac{1}{x} - \frac{1}{60} \right\} = \frac{1}{2}$$

⇒ x = 15min.

Hence, filling pump needs to have rate be $\dfrac{60}{15}$

= 4 times the draining rate.

Therefore, option (A) is correct.

6.

According to the question,

$$\frac{P \times 5 \times 9}{100 \times 12} - \frac{P \times 14 \times 3}{100 \times 12} = 10$$

⇒ P = Rs. 4000

Now,

$$\frac{4000}{100 \times 12} \{5 \times 9 + 14 \times 3\} = Rs.290$$

Hence, option (B) is correct.

7.

First of all we will calculate the weighted ratios of Peter, Harry and John

Weighted ratios of Peter = 6 ×12 = 72

Weighted ratios of Harry = 7 × 12 = 84

Weighted ratios of John = 7 × 6 = 42

Total weighter ratio of Peter, Harry and John together = 198

Total investment at the end of year = $\dfrac{102000 \times 100}{30}$ = Rs. 340000

Investments by John = $\dfrac{340000 \times 42}{198}$ = Rs. 72121.21

Hence, option A is correct.

8.

Given that for every Rs.4 increase in the selling price per tube, the number of tubes sold decreases by 20.

∴ If selling price of each tube is increased by Rs.4 k times, then the selling price per tube is

Rs.48 + 4k.

∴ Profit per tube = (48 + 4k) − 40 = 8 + 4k

Number of tubes sold = 600 − 20k

Profit obtained (8 + 4k) (600 − 20k)

= 80 (2 + k) (30 − k)

= 80[60 + 28k − k^2]

= 80 [256 − 196 + 28k − k^2]

= 80 [256 − (k − 14)^2]

Profit obtained is maximum when k − 14 = 0

∴ k = 14

Hence selling price of each tube = 48 + 56 = Rs.104 and the number of tubes sold

 = 600 − 280 = 320, and

Maximum profit = (104 − 40) (320) = 64 × 320 = Rs. 20480

Hence, option A is correct.

9.

Let, the speed of stream while raining = 'x' Km/h

Speed of boat in still water while raining = 81 ÷ 4.5 = 18 Km/h

So, $\dfrac{54}{18 + x} + \dfrac{36}{18 − x} = 6$

$972 − 54x + 648 + 36x = 1944 − 6x^2$

$6x^2 − 18x − 324 = 0$

$x^2 − 3x − 54 = 0$

$x^2 − 9x + 6x − 54 = 0$

x(x − 9) + 6(x − 9) = 0

(x − 9)(x + 6) = 0

x = 9, − 6

Speed can't be negative.

So speed of stream while raining = 9 Km/h

Speed of stream before rain = $\dfrac{9}{1.5}$ = 6 Km/h

Speed of boat in still water before rain = $\dfrac{18}{0.75}$ = 24 Km/h

So, time taken by boat to cover 75 Km downstream and 99 Km upstream is 'r' hours

Therefore, r = $\dfrac{75}{24 + 6} + \dfrac{99}{24 - 6}$

r = 2.5 + 5.5 = 8

So, the value of 'r' = 8

Hence, option D is correct.

10.

Let, number of red colour balls = 'x'

So, total number of balls in bag = 8 + 6 + x = '14 + x'

Therefore, $\dfrac{^xC_1 \times {}^8C_1}{{}^{(14 + x)}C_2} = \dfrac{22}{75}$

$\dfrac{2 \times x \times 8}{(14 + x)\,(13 + x)} = \dfrac{22}{75}$

600x = 11 × (182 + 27x + x^2)

$600x = 2002 + 297x + 11x^2$

$11x^2 - 303x + 2002 = 0$

$11x^2 - 121x - 182x + 2002 = 0$

$11x(x - 11) - 182(x - 11)$

$(x - 11)(11x - 182)$

$x = 11, \dfrac{182}{11}$

Number of balls cannot be in fraction.

So, x = 11

Reqd probability $= \dfrac{(^{11}C_2 \times {}^8C_1) + (^{11}C_2 \times {}^6C_1) + {}^{11}C_3}{^{25}C_3}$

$= \dfrac{(55 \times 8) + (55 \times 6) + 165}{2300} = \dfrac{935}{2300} = \dfrac{187}{460}$

Hence, option B is correct.