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Mixed Maths Questions for SBI PO Pre, IBPS PO Pre, IBPS Clerk Mains and SBI Clerk Mains Exams.

Direction: Study the following questions carefully and choose the right answer.

1. A right angled triangle, whose perpendicular sides measure 1.8 cm and 2.4 cm, is inscribed in a circle. What is the circumference of the circle (in cm)?

A. 1   B. π   C. 2π   D. 3π   E. None of these

2. There are 52 beggars outside the temple. 312 apples are distributed among them so that each man gets 9 apples and each woman gets 5 apples. Find the number of men and women outside the temple.

A. 13, 39   B. 39, 13   C. 14, 38   D. 26, 26   E. None of these

3. A box contains 21 balls numbered 1 to 21. A ball is drawn and then another ball is drawn without replacement. What is the probability that both balls are even numbered?

A. $\frac{2}{7}$ B. $\frac{8}{21}$ C. $\frac{3}{14}$ D. $\frac{5}{21}$ E. None of these

4. A sum of Rs. 13360 was borrowed at 35/4% per annum compound interest and paid back in two years in two equal annual installments. What was the amount of each installment?

A. Rs. 5,769   B. Rs. 7,569   C. Rs. 7,009   D. Rs. 7,500   E. None of these

5. Hardik and Pandya sold their bats at Rs. 5457 each but Hardik incurred a loss of 15%, while Pandya gained 2%. What is the ratio of the cost price of the bat of Hardik to that of Pandya?

A. 101 : 90   B. 467 : 389   C. 738 : 797   D. 642 : 537   E. None of these

6. The marks scored by Ramnath in three subjects are in the ratio 3 : 5 : 6. Ramnath scored an overall aggregate of 70% in the exam. If the maximum marks in each subject are the same, in how many subjects did Ramnath score more than 75% marks?

A. One   B. Two   C. Zero   D. Can't be determined   E. None of these

7. Ady is a working and Sandy is a sleeping partner in a business. Ady puts in Rs. 20000 and Sandy puts in Rs. 30000. Ady receives 15% of the profit for managing the business, and the rest is divided in proportion to their capitals. If the total profit is Rs. 10500, then find the share of Sandy in the profit.

A. Rs. 5355   B. Rs. 3570   C. Rs. 5000   D. Rs. 5400   E. None of these

8. A driver of a auto rickshaw sees a lorry 60 meters ahead of him. After 30 seconds the lorry is 90 meters behind. If the speed of the auto rickshaw is 38 kmph, then what is the speed of the lorry?

A. 23 kmph   B. 25 kmph   C. 20 kmph   D. 18 kmph   E. None of these

9. The price of rice has increased by 20%. Lalu has decided to spend only 8% more than what he initially did on buying rice. What is the percentage decrease in Lalu's rice consumption?

A. 10%   B. 13%   C. 18%   D. 14%   E. None of these

10. The sum of the ages of Kidambi and Srikanth 14 years hence will be equal to 2 times their present age. If at present Kidambi is 8 years elder to Srikanth, then what are their present ages?

A. 22, 8   B. 29, 12   C. 18, 10   D. 13, 6   E. None of these

11. The MRP of a article is 60% above its manufacturing cost. The article is sold through a retailer, who earns 19% profit on his purchase price. What is the approx. profit percentage for the manufacturer who sells his article to the retailer? The retailer gives 15% discount on MRP.

A. 15.2%   B. 14.2%   C. 13%   D. 12.5%   E. Can't be determined

12. In an exam of 100 marks, the average marks of a class of 40 students are 76. If the top 3 scorers of the class leave, the average score falls "down by 1. If the other two toppers except "the highest topper scored not more than 85. "then what is the minimum score the topper can score?

A. 86   B. 98   C. 95   D. 92   E. None of these

13. What is the total surface area of a rectangular parallelopiped having volume 408 c.c. and a base area of 24 sq.cm? The length of the cuboid is one-sixth the base area.

A. 326   B. 382   C. 388   D. 438   E. None of these

14. Rashid borrowed Rs. 15000 at the rate of 10% p.a. rate of compound interest, compound annually. He repaid a certain amount at the end of the first. Then he paid Rs. 12100 at the end of the 2nd year to completely discharge the loan. What amount did he repay at the end of 1st year?

A. 4500   B. 5500   C. 6500   D. 5800   E. None of these

15. There are three athletes A, B and C at a same point. A starts running from a point at a speed of 40 m/min. After 5 minutes, B starts running after A with a speed of 50 m/min. Simultaneously, C also starts running after A at 60 m/min. What distance has C covered (in m) when he catches A?

A. $\dfrac{500}{3}$ B. $\dfrac{1300}{3}$ C. $\dfrac{700}{3}$ D. 600   E. None of these

16. The hourly wages of a mason have increased by 25%. Since the increase, the number of hours he works daily has reduced by 16%. If he was earning Rs. 120 per day before the increase, how much (in Rs.) is he earning now?

A. 124.5   B. 115.5   C. 126   D. 120   E. None of these

17. There are 3 green, 4 orange and 5 white color bulbs in a bag. If a bulb is picked at random, what is the probability of having either a green or a white bulb?

A. $\dfrac{3}{4}$ B. $\dfrac{2}{3}$ C. $\dfrac{4}{3}$ D. $\dfrac{2}{5}$ E. None of these

18. Three men Ashok, Bindusar and Chankya invested Rs. 11000, Rs. 12000 and Rs. 17000 in a partnership business for a year. After a year, they got a return of Rs. 100000. If they decide to divide the amount on the basis of their shares of investment, then what amount will Chankya receive more than Ashok?

A. 12000   B. 15000   C. 27000   D. 35000   E. None of these

19. A boat takes 6 hours to cover 100 km downstream and 30 km upstream. If the boat goes 75 km downstream and returns back to its starting point in 8 hours, what is the speed of the boat in still water and the rate of the stream (in kmph) respectively?

A. 25 and 4   B. 25 and 5   C. 30 and 10   D. 20 and 5   E. None of these

20. A and B are the two alloys which were made by mixing aluminium and silver in the ratio 5 : 7 and 9 : 11. If 30 grams of alloy A and 50 grams of alloy B are melted and mixed to form another alloy C, what is the ratio of aluminium and silver in the new alloy C?

A. 7 : 9   B. 3 : 4   C. 4 : 11   D. 7 : 6   E. None of these

21. A sum of Rs. 10000 was invested in a scheme. The rate of simple interest offered for three years was 6%, 9% and 5% per annum respectively. After three years, the whole amount was withdrawn and reinvested in a scheme which offered an interest rate of 20% compounded annually for 3 years. What is the total interest earned during the six year period?

A. 8924   B. 10736   C. 12468   D. 13644   E. None of these

22. Salman was travelling on one side of the Yamuna express way with a constant speed of 120 kmph in his car. Govinda was travelling with a constant speed of 80 kmph in the opposite direction. When they crossed each other, Salman decided to take a U-turn and meet him. But before taking a U turn, Salman had to travel for another 3 minutes. How long will it take for Salman to meet Govinda? [Assume time taken by Salman to take U turn is negligible]

A. 29 minutes   B. 28 minutes   C. 30 minutes   D. 33 minutes   E. None of these

23. An Article costs Rs. 5000 and it is marked up 40% by the shopkeeper. A customer walks into the shop and seems really interested in the article. Sensing this, the shopkeeper gets greedy and he raises the markup % to 80% and gives a discount of 20% to the customer. How much more/less money would he had made, had he not gotten greedy?

A. Rs. 200 more   B. Rs. 200 less   C. Rs. 400 more   D. Rs. 400 less   E. None of these

24. Radhe does 70% of some work in 15 days. Later, with Shyam's help, she completes the remaining work in 4 days. In how many days can Shyam alone complete the entire work?

A. 35 days   B. 35.2 days   C. 35.3 days   D. 38.4 days   E. None of these

25. Mr. Natwarlal is playing a game in which there are 4 boxes with different number of of balls and in total there are 4 different coloured balls. A ball has to be taken out from each box and the color of the ball is revealed only after it has been taken out. The game is won when all four are of same colour.The balls cannot be seen by Mr. Natwarlal but the dealer happened to be a friend of Mr. Natwarlal and the dealer told him about the distribution of different balls in different boxes. The distribution is as follows:

Box A. Red, Yellow, Black

Box B. Red, Yellow

Box C. Yellow, Yellow, Red

Box D. Red, Black, Yellow, Blue
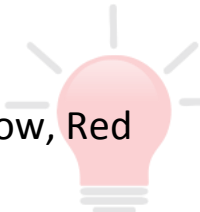
Which colour Ball should Mr. Natwarlal choose in order to maximise his winning probability?

A. Red   B. Yellow   C. Black   D. Blue
E. All have the same probability of winning

26. Average weight of three friends Amar, Visera and Daman is 70 kg. Another person Vishal joins the group and now the average is 66 kg. If another person Tahir whose weight is 6 kg more than Vishal, joins the group replacing Amar, then average weight of Visera, Daman, Vishal and Tahir becomes 75 kg. What is the weight of Amar (in kg)?

A. 18   B. 20   C. 22   D. 24   E. None of these

27. The production of a company has ups and downs every year. The production increases for two consecutive years consistently by 15% and in the third year it decreases by 20%. Again in the next two years it increases by 25% each year and decreases by 10% in the third year. If we start counting from the year 2014 approximately what will be the effect on the production of the Company in 2018?

A. 22   B. 32   C. 30   D. 20   E. None of these

28. If a cone of maximum volume is carved from a cylinder of radius of 35cm and height 150cm, what is the curved surface area of the cylinder which can be made from the remaining metal if its radius is 70cm?

A. $1.1m^2$ B. $1.2m^2$ C. $1.3m^2$ D. $1.5m^2$ E. Can't be determined

29. A mixture has milk and water in the ratio of 7 : 2. If 5 litre of milk and 6 litre of water is added to the mixture the ratio becomes 5 : 2. By how much percent is the quantity of milk more than the quantity of water in the final mixture?

A. 100%   B. 125%   C. 120%   D. 200%   E. None of these

30. Abhishek, Bhuvan and Chandan invested 10000, 15000 and 20000 respectively. After 6 months, Abhishek withdrew 20% of his investment, Bhuvan invested 30% more and Chandan doubled his investment. If total profit earned at the end of the year is 9450. What is difference between the share of Abhishek and Chandan in the profit?

A. 3756   B. 3484   C. 3972   D. 3528   E. None of these

31. In a village, two contestants (A & B) are contesting in an election. 70% of the registered voters cast their votes in the election and A wins the election by 400 votes. If A had received 12.5% less votes, A's votes would have been equal to B's votes. How many registered voters are there in the village?

A. 4500   B. 4200   C. 4000   D. 4250   E. None of these

32. A Mixture of milk and water in a vessel has milk and water in the ratio 3 : 1. 32 liters of mixture is taken out and replaced completely with milk such that the ratio of milk and water now becomes 4 : 1. What will be the quantity of water left in the mixture if 10 liters of mixture is again taken out from the vessel?

A. 24   B. 46   C. 15   D. 30   E. None of these

33. The taxi charges in a city consist of fixed charges and additional charges per kilometer. The fixed charges are for a distance of up to 5 km and additional charges are applicable per kilometer thereafter. The charge for a distance of 10 km is Rs 350 and for 25 km is Rs. 800. The charge for a distance of 30 km is-

A. Rs. 800   B. Rs. 750   C. Rs. 900   D. Rs. 950   E. None of these

34. In a square field of side 30 metres, 4 cows are grazing the field as they are tied at each of the four corners with a 14 metre long rope for each cow. What is the ungrazed area in the field?

A. 356 sq m   B. 216 sq m   C. 324 sq m   D. 284 sq m   E. None of these

35. A and B undertake a project worth Rs. 54000 . A alone can do the work in 10 days. They work together for 3 days. After 3 days, B works alone for 3 days and A completes the remaining work in 3 more days.What is the share of B in the earnings?

A. Rs. 21600   B. Rs. 33400   C. Rs. 27800   D. Rs. 35780   E. None of these

36. A box contains slips with numbers from 1 to 50 written on them. A slip is drawn and replaced. Then another slip is drawn and after replacing another slip is drawn. What is the probability that an even number appears on the first draw, an odd number on the second draw and a number divisible by 3 on the third draw?

A. $\frac{1}{25}$ B. $\frac{2}{25}$ C. $\frac{8}{25}$ D. $\frac{4}{25}$ E. None of these

37. The average salary of a company increases by 100 when the salary of the manager, which is Rs. 9500, is included. If the number of employees excluding the manager is the smallest cube divisible by 16, what is the final average of the company?

A. Rs. 4000   B. Rs. 3400   C. Rs. 3700   D. Rs. 3100   E. None of these

38. A costs twice as much as B. A is sold at a loss of 10% and B is sold at 7/5th of its price. If selling price of A is Rs. 1200 more than selling price of B, what is the cost price of A?

A. Rs. 2400   B. Rs. 3000   C. Can't be determined   D. Rs. 6000   E. None of these

39. A sum of Rs. 5000 is compounded annually for 3 years at an interest rate of 10%. After 3 years, the interest earned is reinvested into a scheme offering simple interest of 8% for 5 years. What is the total profit earned on the whole transaction?

A. Rs. 2234   B. Rs. 2317   C. Rs. 2564   D. Rs. 2419   E. None of these

40. A metal cylinder with radius 24.5 cm and height 200 cm is melted into 14 spheres of equal radius. What is the volume of each sphere if during melting 10% of the metal is lost?

A. 32450 cm^3 B. 21570 cm^3 C. 24255 cm^3 D. 25670 cm^3 E. None of these

41. A firm of readymade garments makes both men's and women's shirts. Its average profit is 5% of the sales. Its profit in men's shirts average 9% of the sales and women's shirts comprise 60% of the output. The average profit per sale rupee in women shirts is

A. 0.0266   B. 0.0466   C. 0.0433   D. 0.0233   E. None of these

42. P, Q and R started a business in partnership by investing Rs. 15000, Rs. 20000 and Rs. 24000, respectively. P left the partnership after 4 months taking back the original amount he invested. At the end of the year, P, Q and R received their profits. Q received a profit of Rs. 2000. How much profit P would have received if he had continued till end of year assuming the annual profit to have increased proportionally?

A. Rs. 1200   B. Rs. 1350   C. Rs. 1500   D. Rs. 1620   E. Rs. 1720

43. If the ratio of speed of doing work of three persons is 1 : 3 : 5, what is the ratio of time taken by these people to do the same amount of work?

A. 15 : 5 : 7   B. 3 : 15 : 5   C. 15 : 3 : 5   D. 15 : 5 : 3   E. None of these

44. A person had a certain amount. He invested 5/6th of it in shares, 5% of it in mutual funds, 10% of it in debentures and kept the remaining Rs. 850 with him. If got interest at 10% for a year on debentures, what amount did he get as interest?

A. Rs. 5,100   B. Rs. 7,650   C. Rs. 510   D. Rs. 765   E. Rs. 255

45. A family consists of paternal grandparents, parents and three grandchildren. The average age of the grandparents is 70 years, that of the parents is 40 years and that of the grandchildren is 10 years. What is the average age of the family?

A. $34\frac{4}{7}$ years   B. $35\frac{5}{7}$ years   C. $32\frac{1}{7}$ years   D. $37\frac{1}{2}$ years   E. None of these

46. When 4 fair coins are tossed together what is the probability of getting at least 3 heads?

A. $\frac{1}{4}$ B. $\frac{3}{4}$ C. $\frac{5}{16}$ D. $\frac{3}{8}$ E. None of these

47. The diameter of a circle is 1 cm more than twice the side of a particular square. If the semi-perimeter of the square is 14 cm, what is the approximate area of the circle?

A. 177 cm^2 B. 706 cm^2 C. 389 cm^2 D. 195 cm^2 E. None of these

48. Ramesh goes downstream at speed of 15 km/hr. However when he goes upstream his speed decreases by 66.66 %. What will be the net speed of his boat when it travels upstream if the speed of the stream is doubled?
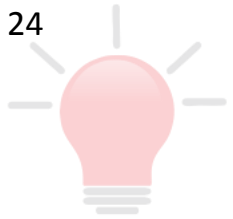
A. 0 km/ hr   B. 5 km/ hr   C. 2.5 km/ hr   D. 20 km/ hr   E. 25 km/ hr

49. A tank is in the form of a right circular cone with vertex at top. There are two pipes attached to the tank. One of them can fill the tank alone in 20 minutes, while other can do the same in 40 minutes. If both pipes are opened, how much time will they take to fill the tank to half of its height (in minutes)?

A. 8.33   B. 11.67   C. 13.33   D. 14.5   E. 18.87

50. A certain number of cricket balls were purchased for Rs. 1800. Six more cricket balls could have been purchased for the same amount if each cricket ball was cheaper by Rs. 10. Find the number of cricket balls purchased.

A. 36   B. 24   C. 30   D. 25   E. None of these

CORRECT OPTIONS:

1	2	3	4	5	6	7	8	9	10
D	A	C	B	E	A	A	C	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	C	C	B	D	C	B	B	D	A
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	E	B	C	B	D	B	A	E	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
C	D	D	D	A	B	D	D	B	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
D	C	D	C	B	C	A	A	B	C

Explanations:

1. As the angle in a semicircle is always a right angle, any right angled triangle with all three of its points on the circumference of a circle must have its hypotenuse as the diameter.

To find the diameter, we just need to find the hypotenuse using the Pythogoras theorem.

∴ Hypotenuse = $\sqrt{1.8^2 + 2.4^2}$ = 3 CM

∴ The circumference of the circle = πD = 3π cm

Hence, option D is correct.

2. **Approach I:**

Let the no. of men be x and women be y.

Now, as per the question

x + y = 52 **...(i)**

9x + 5y = 312 **...(ii)**

After solving eqn. (i) and (ii), we get

x = 13 (Men), y = 39 (Women)

Hence, option A is correct

Approach II:

Value of apple per begger = $\dfrac{312}{52}$ = 6 apples

```
Men     Women
 9         5
   \ /
    6
   / \
 1     3
```
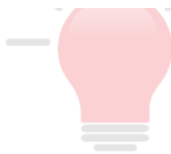
∴ Men : Women = 1 : 3

∴ Number of Men = $\dfrac{52}{1 + 3}$ × 1 = 13

Add number of Women = 52 − 13 = 39

Hence, option A is correct.

3. There are 10 even numbers in the group 1-21.

∴ The probability that the first ball is even numbered = $\dfrac{10}{21}$

Since the ball is not replaced there are now 20 balls left, of which 9 are even numbered.

∴ The probability that the second ball is even numbered = $\dfrac{9}{20}$

∴ Reqd. probability = $\dfrac{10}{21} \times \dfrac{9}{20} = \dfrac{9}{42} = \dfrac{3}{14}$

Hence, option C is correct.

4. Let the each instalment be x.

$$\frac{x}{\left(1+\dfrac{35}{4\times100}\right)} + \frac{x}{\left(1+\dfrac{35}{4\times100}\right)^2} = 13360$$

$$\frac{x}{\left(1+\dfrac{7}{80}\right)} + \frac{x}{\left(1+\dfrac{7}{80}\right)^2} = 13360$$

$$\Rightarrow \frac{80\,x}{87} + \frac{6400\,x}{7569} = 13360$$

$$\Rightarrow \frac{6960\,x + 6400\,x}{7569} = 13360$$

$\Rightarrow 13360\,x = 13360 \times 7569 \Rightarrow x = \text{Rs. } 7569$

Hence, option B is correct.

5.

CP of Hardik's bat $= \dfrac{5457}{85} \times 100$

$= 5457 \times \dfrac{20}{17} = 321 \times 20 = \text{Rs. } 6420$

CP of Pandya's bat $= \dfrac{5457}{102} \times 100$

$= \dfrac{5457}{51} \times 50 = 107 \times 50 = \text{Rs. } 5350$

$\therefore$ Ratio $= 6420 : 5350 = 642 : 535 = 6 : 5$

Hence, option E is correct.

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6. Let the maximum marks in each subject be 100.
$\therefore$ Ramnath's total score = 70% of (100 + 100 + 100) = 70% of (300) = 210
Also, 75% marks in a subject correspond to 75% of (100) = 75
Let Ramnath have scored 4x, 5x and 6x in the three subjects.
$\therefore$ 3x + 5x + 6x = 210
$\therefore$ 14x = 210 i.e. x = 15
Hence, his marks in the three subjects are 45, 75 and 90 .
Hence, he has scored more than 75 in exactly one subject.
Hence, option A is correct.

7. The amount which Ady receives for managing the business

$$= \frac{15}{100} \times 10500 = 1575$$

Remaining amount of profit = 10500 − 1575 = Rs. 8925
The rest of the profit is to be divided in the ratio 2 : 3.

∴ Sandy's share in the profit = $8925 \times \frac{3}{5}$ = Rs. 5355

Hence, option A is correct.

8.

$$\text{Relative speed} = \frac{\text{Total distance}}{\text{Total time}} = \frac{60 + 90}{30} = 5 \text{ m/s}$$

∴ 5 m/s = $5 \times \frac{18}{5}$ = 18 kmph

Now relative speed = speed of auto rickshaw − speed of lorry
or, 18 = 38 − speed of lorry
∴ Speed of lorry = 38 − 18 = 20 km/h
Hence, option C is correct.

---

9. Let the initial price of Lalu be Rs. 100 per unit and Lalu's consumption be 10 units.
∴ Initial amount spent = 100 × 10 = Rs. 1,000
New price of rice = 120% of 100 = Rs. 120 and new total amount spent = 108% of 1000 = Rs. 1,080

∴ New consumption = $\frac{1080}{120}$ = 9 units

∴ Decrease in consumption = 1 unit

∴ % decrease = $\frac{1}{10} \times 100 = 10\%$

Hence, option A is correct.

---

10. Let the present ages of Kidambi and Srikanth be x years and y years respectively.
As per the question,
(x + 14) + (y + 14) = 2(x + y)
x + y + 28 = 2x + 2y
x + y = 28   **.....(i)**
Also,
y + 8 = x
x − y = 8   **.....(ii)**
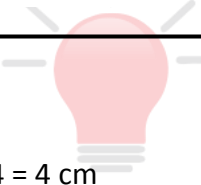Solving eqns (i) and (ii), we get
x = 18 and y = 10
Therefore, Present ages of Kidambi and Srikanth is 18 years and 10 years respectively
Hence, option C is correct.

11. The manufacturer sells the product to retailer, and then retailer sells to the customer.
Assume manufacturing cost = 100 and manufacturer profit = x
As Maximum Retail Price (MRP) of a product is 60% above its manufacturing cost,
MRP = 160% of 100 = 160
The retailer gives 15% discount on MRP. So, customer price is 85% of MRP.
 Buyer Price = 85% of 160 = 136
Manufacturer makes x rupees profit, and then retailer makes 19% profit.
So, 119% of (100 + x) = 136
$\Rightarrow$ 119 (100 + x) = 13600
$\Rightarrow$ (100 + x) = 114.28
$\Rightarrow$ x = 14.28
Hence, Manufacturer profit = 14.2%
The correct option is B.

---

12. Total score of 40 students = (40 × 76) = 3040
Total score of top 3 scorers = 3040 − (37 × 75) = 265
To minimize the score of the top scorer, we assume the other two top scorers score the maximum they can = 85 marks each.
So, the top scorer scored = 265 − 170 = 95 marks.
Hence, option C is correct.

13.

Length (l) = $\dfrac{1}{6}$ × 24 = 4 cm

Base area = l × b = 24 sq.cm

$\therefore$ Breadth (b) = $\dfrac{24}{4}$ = 6 cm

Volume of Cuboid (lbh) = 408

$\therefore$ Height (h) = $\dfrac{408}{24}$ = 17 cm

$\therefore$ Total Surface area = 2(lb + bh + lh)
= 2(4 × 6 + 6 × 17 + 17 × 4)
= 2(24 + 102 + 68) = 388 sq.cm
Hence, option C is correct.

14. Rs. 15000 borrowed at 10% p.a. will become Rs. 16500 at the end of the 1st year. Let k be the amount repaid at the end of the first year. Then the balance is Rs. 16500 - k will become the principal for the second year.

$\Rightarrow$ 110% of (16500 – k) = 12100
$\Rightarrow$ 16500 – k = 11000
$\Rightarrow$ k = Rs. 5500.
Hence, option B is correct.

---

15. When B started, A is ahead by 40 × 5 = 200 m
But C will catch A before the B as he is faster than the B.
Since A and C run in the same direction, relative speed of C = 60 – 40 = 20 m/min

$\therefore$ Time taken by C to actually catch A = $\dfrac{200}{20}$ = 10 mins

Distance actually covered by C in this duration = 10 × 60 = 600 m
Hence, option D is correct.

---

16. Daily wages = hourly wages × work hours.
Let the original hourly wages and work hours be Rs. x and y hours respectively.
Since he used to earn Rs. 120 earlier, xy = 120
New hourly wages = Rs. (1.25x) and new working hours = 0.84y
$\therefore$ New daily wages = (1.25x)(0.84y) = 1.05xy = 1.05 × 120 = Rs. 126
Hence, option C is correct.

---

17. Let E_1, E_2 be the event of picking a green bulb and white bulb respectively.
Total no. of bulbs in a bag = 3 + 4 + 5 = 12

$E_1 = \dfrac{3}{12} = \dfrac{1}{4}$

$E_2 = \dfrac{5}{12} = \dfrac{5}{12}$

$P(E_1 \text{ or } E_2) = P(E_1) + P(E_2)$
$= \dfrac{1}{4} + \dfrac{5}{12} = \dfrac{2}{3}$

Hence, option B is correct.

18. Chankya invested Rs. 17000 of the total (11000 + 12000 + 17000) = Rs. 40000. So, his share s 17/40 of the total amount.

$$\left(\frac{17}{40} - \frac{11}{40}\right) = \frac{6}{40} = \frac{3}{20}$$

Ashok will receive of the total amount.

So, Chankya will receive of the total amount more than Ashok

$$= \frac{3}{20} \times 100000 = 15000$$

Hence, option B is correct.

19. Let the speed of the boat be x and speed of stream be y.
∴ Upstream speed = (x − y) and downstream speed = (x + y)
So we get,

$$\frac{100}{(x + y)} + \frac{30}{(x - y)} = 6$$

Let $[\frac{1}{x + y}] = a$ and $b = [\frac{1}{x - y}]$

∴ 100a + 30b = 6   **.....(i)**
Similarly,
75a + 75b = 8   **.....(ii)**

Solving both the equations simultaneously we get,

$a = \frac{1}{25}$ and $b = \frac{1}{15}$

∴ x + y = 25 and x − y = 15
Solving for x and y, x = 20 and y = 5
Hence, option D is correct.

20.

Aluminium in alloy C = $\left[30 \times \frac{5}{12}\right] + \left[50 \times \frac{9}{20}\right] = 35$

Silver in alloy C = $\left[30 \times \frac{7}{12}\right] + \left[50 \times \frac{11}{20}\right] = 45$

Ratio of aluminium and silver in alloy C = 35 : 45 = 7 : 9
Hence, option A is correct.

21. The total interest rate for the first 3 years is 6 + 9 + 5= 20% and after that the interest is compounded annually for 3 years at the rate of 20% per annum.

The total amount received from the first investment = 120% of 10000 = 12000

Now, 12000 is invested for 3 years at 20% compound interest per year.

By the net % effect formula, we can calculate the total % increase in amount.

So, at the rate of 20% for 3 years, we get 72.8% as the total percentage increase. Hence, the final amount received will be 172.8% of 12000

172.8% of total investment = 172.8% of 12000 = 20736
So, the total interest earned in 6 years period= 20736 – 10000 = 10736.
Hence, option B is correct.

22.

Distance Travelled by Salman in 3 minutes = $\frac{3}{60}$ × 120 = 6 km

Distance travelled by Govinda in 3 minutes = $\frac{3}{60}$ × 80 = 4 km

Hence Salman will have to travel a distance of 10 km before catching up with Govinda.

Relative speed of Salman to that of Govinda after taking U turn = 120 – 80 = 40 kmph

∴ Time taken by Salman after taking U turn to Meet Govinda = 10/40 = 15 minutes

Total time taken by Salman to meet Govinda = (3 + 15)minutes = 18 minutes

Hence, option E is correct.

---

23. We can compare Selling Price to get the answer.

First Scenario: When markup was 40%
= 140% of 5000 = 7000

Second Scenario: When there is markup of 80 % and then a discount of 20%
= 80% of 180% of 5000 = 7200

In the second scenario, he is earning Rs. 200 less.

So we can say that he would have earned Rs. 200 less, had he not gotten greedy.

Hence, option B is correct.

24. Let total work = 150 units

Since Radhe does 70% of the work (i.e. 105 units) in 15 days,

Radhe = $\dfrac{105}{15}$ = 7 units per day

Work left = 150 − 105 = 45 units

Let Shyam do x units of work per day. Shyam and Radhe finish the pending work in 4 days.

∴   4(x + 7) = 45

∴   4x = 45 − 28 = 17 i.e. x = 4.25 units

∴   Time taken by Shyam to complete the work = 150/4.25 = 35.29 ≈ 35.3 days

Note that 0.3 is equivalent to 5/17 (among the options).

Hence, option C is correct.

---

25. The winning probability are as follows:

Red: $\dfrac{1}{3} \times \dfrac{1}{2} \times \dfrac{1}{3} \times \dfrac{1}{4} = \dfrac{1}{72}$

Yellow: $\dfrac{1}{3} \times \dfrac{1}{2} \times \dfrac{2}{3} \times \dfrac{1}{4} = \dfrac{2}{72}$

So here we can see that Yellow's probability of winning is twice than Red. So logically Mr. Natwarlal should choose Yellow Ball. Black and Blue can't win because they are not present in every box.)

Hence, option B is correct.

---

26. Total weight of Amar, Visera and Daman = 70 × 3 = 210 kg

Again, Amar + Visera + Daman + Vishal = 66 × 4 = 264 kg   .... (i)

∴ Weight of Vishal = 264 − 210 = 54 kg

∴ Weight of Tahir = 54 + 6 = 60 kg

Now, as per the question

Visera + Daman + Vishal + Tahir = 75 × 4 = 300 kg. .... (ii)

Subtracting (i) from (ii), we get

Tahir − Amar = 60 − Amar = 300 − 264 = 36

Therefore, weight of Amar = 60 − 36 = 24 kg

Hence, option D is correct.

27. Suppose the production of the company in the year 2014 be x.

Then production of the company in year 2018

$$= x \times \frac{115}{100} \times \frac{115}{100} \times \frac{80}{100} \times \frac{125}{100} = 1.32x$$

∴ Increase % in the production in year 2018

$$= \frac{(1.32x - x) \times 100}{x} = 32\%$$

Hence , option B is correct.

---

28. We know that the volume of a cylinder is $\pi r^2 h$

and the volume of a cone is $\frac{1}{3} \times \pi r^2 h$

Since radii of both cylinder and cone are same, we can say that the remaining volume will be $\frac{2}{3} \times \frac{22}{7} \times r^2 h$

And since the volume always remain same, we can say that the new structure will have same volume but only different

radius and height. We can therefore equate the volumes

$$\frac{2}{3} \times \frac{22}{7} \times 35^2 \times 150 = \frac{22}{7} \times 70^2 \times h$$

Now curved surface area is $= 2 \times \frac{22}{7} \times r \times h$

Putting value of r= 70 and h as 25 we get

$$CSA = 2 \times \frac{22}{7} \times 70 \times 25 = 11000 \text{ cm}^2 \text{ or } 1.1 \text{m}^2$$

Hence, option A is correct.

29. Let the initial quantities of milk and water be 7x and 2x respectively

According to the scenario, 5 litre of milk is added and 6 litres of water and ratio becomes 5:2

We can put it in equation like this,

$$\frac{7x + 5}{2x + 6} = \frac{5}{2}$$

We get x = 5

Putting in the assumed quantities we get initial qty milk as 35 litre and water as 10 litre.

So final quantities are 35 + 5= 40 and 10 + 6 = 16

Now Milk is 24 litres more than water which can be expressed into %age as

$$\frac{24}{16} \times 100 = 150\%$$

Hence, option E is correct.

---

30. During the first 6 months, their share is

Abhishek: 10000 × 6= 60000

Bhuvan: 15000 × 6= 90000

Chandan: 20000 × 6= 120000.

After 6 months, there is a change in their investment structure. So, there share for the next 6 months becomes.

Abhishek: (80% of 10000) × 6 = 48000

Bhuvan: (130% of 15000) × 6= 117000

Chandan: (20000 × 2) × 6 = 240000

So their total share becomes:

Abhishek: 60000 + 48000 = 108000

Bhuvan: 90000 + 117000 = 207000

Chandan: 120000 + 240000 = 360000

Now the profit is Rs. 9450 and the difference between the total share of Abhishek and Chandan is 252000 and the total share is 675000.

So the difference in their share in profit can be found out as:= $\frac{9450 \times 252000}{675000}$ = Rs. 3528

Hence, option D is correct.

31. Let the votes received by A be x & B be y.
Now as per the given statements,
x − y = 400   **.....(1)**

Also $\left(\frac{87.5}{100}\right)x = y + \left(\frac{12.5}{100}\right)x$ **...(2)**

(The votes lost by A would go into B's account)

solving (2), we get

$y = \left(\frac{3}{4}\right)x$ **....(3)**

Using (3) to solve (1) we get

$x − \left(\frac{3}{4}\right)x = 400$

x = 1600
And, y = 1200
Now, we know that A & B collectively won 70% of total votes.
If the total number of registered voters in the village be Z,

Then, $\left(\frac{70}{100}\right)Z = 1600 + 1200 = 2800$

Z = 4000
Hence, option C is correct.

---

32. Initial quantity of milk in the vessel = 3x litres
Initial quantity of water = x litres

In 32 litres of mixture, Milk = $\frac{3}{4} \times 32$ = 24 liters

∴   Water = 8 litres
According to the given statements,

$\frac{(3x − 24 + 32)}{x − 8} = \frac{4}{1}$

or,   3x + 8 = 4x − 32 or x = 40
Therefore, Quantity of Water in the new mixture = x − 8 = 40 − 8 = 32 liters
Again, 10 litres of mixture is removed.

In 10 Liters of mixture, Water = $\frac{1}{5} \times 10$ = 2 liters

Hence the remaining quantity of water, i.e.
Required quantity of water = 32 − 2 = 30 liters
Hence, option D is correct.

33. Let the fixed charges = Rs. x (for the first 5 km)

and the additional charges = Rs. y /km

As per the question,

x + 5y = 350 ....(i)

x + 20y = 800 ...(ii)

On solving eqn. (i) and (ii), we get

x = 200, y = 30

∴ Charge for a distance of 30 km.

= x + 25y = 200 + 30 × 25 = Rs. 950

Hence, option D is correct.

34. The total area of the field is 30 × 30 = 900 sq metres

The cows are can access only a quarter of what the reach of their rope as they are in a corner so all four of them graze 4 quarters

$$4 \times \frac{1}{4} \times \frac{22}{7} \times 14 \times 14 = 616$$

So the ungrazed area is 900 − 616 = 284 sq metre

Hence, option D is correct.

35. A can do 10% work in a day. A has worked 6 days in total. And so has B
A completed 60% work in 6 days and B did 40% in 6 days.
Efficiency of A and B = 6 : 4

B's share = $\frac{4}{10} \times 54000 = 21600$

Hence, option A is correct.

36. The probability of an even number appearing on the first draw is 1/2(since there are 25 even numbers in counting of 1 to 50).

The probability of an odd number appearing on the second draw is 1/2(since there are 25 odd numbers in counting of 1 to 50).

The probability of a number divisible by 3 appearing on the third draw is 16/50 (since there are 16 numbers that are divisible by 3 while counting from 1 to 50.)

Since all these events have no relation with each other and no dependence either, and the slips are replaced, we can directly multiply the individual probabilities to get the resultant probability.

So, the probability of all the events taking place is

$$\frac{1}{2} \times \frac{1}{2} \times \frac{16}{50} = \frac{2}{25}$$

Hence, option B is correct.

---

37. The smallest cube divisible by 16 is 64.

Lets assume the average salary before the manager's salary is included is x

After addition of Manager's salary the average increases by 100

We can write down the above information in form of an equation as:

64x + 9500 = 65 × (x + 100)

Solving for x, we get x = 3000

The final average is 3000 + 100 = Rs. 3100

Hence, option D is correct..

---

38. Let the cost of B be 100x (for the sake of ease in computation)
So cost of A becomes 200x
Now SP of A becomes 90% of 200x = 180x

And SP of B becomes $100x \times \frac{7}{5}$ = 140x

The difference between both of them is 40x
Since this difference corresponds to Rs. 1200, 40x = 1200   or x = 30
There cost of A becomes 200 × 30 = Rs. 6000
Hence, option D is correct.

39. When Rs. 5000 is compounded annually for 3 years at the rate of 10% interest. the effective rate of interest for three years becomes 33.1% (Kindly refer to Sub-details) and the amount becomes:

$\Rightarrow$ 133.1% of 5000 = 6655

The interest earned is 6655 – 5000 = 1655
This is reinvested into another scheme offering 8% per annum for 5 years the interest become 40%
The amount becomes = 140% of 1655 = Rs. 2317

Sub details:
We can calculate the effective rate of interest by applying the net% effect formula
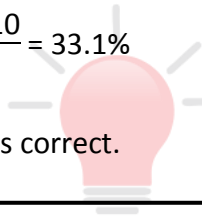
$= x + y + \dfrac{xy}{100}\%$

Here, x = 10% and y = 10%
So, the effective rate of interest for 1st two years will be as follows:

$= 10 + 10 + \dfrac{10 \times 10}{100} = 21\%$

Again for, 3rd year

$= 21 + 10 + \dfrac{21 \times 10}{100} = 33.1\%$

Hence, option B is correct.

---

40. The volume of the cylinder is = $\pi r^2 h$

$= \dfrac{22}{7} \times 24.5 \times 24.5 \times 200 = 377300$

Since 10 percent of metal is lost in the process of melting, the remaining metal is 90% of 377300 = 339570 cm³

Since it is to be divided into 14 spheres the volume of each sphere will be

$\dfrac{339570}{14} = 24255$ cm³

Hence, option C is correct.

41. Let the total sales be Rs. 100

Women's shirt comprise 60% of the output

⇒ Rs. 60 out of Rs. 100 is sales of female's shirts

∴ Men's shirts comprise (100 – 60) = 40% of the output

⇒ Rs. 40 out of Rs. 100 is the sales of male's shirts

∴ Average profit from men's shirt = 9% of 40 = Rs. 3.6

Overall average profit = 5 % of 100 = Rs. 5

∴ Average profit from women's shirts = 5 – 3.6 = Rs. 1.4

This is from the sale of Rs. 60

∴ The profit per rupee is $\dfrac{1.4}{60}$ = 0.0233

∴ The average profit per sale rupee in women shirts is Rs. 0.0233

Hence, option D is correct.

---

42. Money invested by Q = Rs. 20000 for 12 months

Total money invested = Rs. 15000 for 4 months + Rs. 20000 for 12 months + Rs. 24000 for 12 months

So, Q's investment : Total investment : : Q's profit : Total profit

Therefore, total profit $= \dfrac{(15 \times 4 + 20 \times 12 + 24 \times 12)}{(20 \times 12)} \times$ Rs. 2000 = Rs. 4900

Profit earned by P $= \dfrac{(15 \times 4)}{(20 \times 12)} \times$ Rs. 2000 = Rs. 500

If P would have continued for full year (12 months) instead of 4 months, his profit would have been 3 times of what he got now = 3 × Rs. 500 = Rs. 1500

Hence, option C is correct.

---

43. Let the speed of doing work of the three persons be 1x, 3x and 5x respectively

Time taken by each person = amount of work done/speed of doing work

Let the amount of work for each person = y (∵ work done is same)

The time taken by the first person $= \dfrac{y}{x}$

The time taken by the second person $= \dfrac{y}{3x}$

The time taken by the third person $= \dfrac{y}{5x}$

The ratio of time taken $= \dfrac{y}{x} : \dfrac{y}{3x} : \dfrac{y}{5x}$

⇒ $1 : \dfrac{1}{3} : \dfrac{1}{5}$ = 15 : 5 : 3

Hence, option D is correct.

44. 5/6 corresponds to 83.33%.

Hence, the amount that he kept with him corresponds to 100 − (83.33 + 5 + 10) = 1.67% of the total amount with him. This corresponds to Rs. 850

Also, because he placed 10% in debentures and he got 10% interest, amount obtained in interest = 10% of 10% of amount with him i.e. 1% of the amount with him.

$$\therefore \text{ Interest earned} = \frac{(850 \times 1)}{1.67} = 850 \times \frac{3}{5} = 510$$

Hence, option C is correct.

---

45. The family consists of grandparents, parents and three grandchildren.
So, the number of family members = 2 + 2 + 3 = 7
We know,

$$\text{Average of quantities} = \frac{\text{Sum of all quantities}}{\text{No. of quantities}}$$

The average age of the grandparents is 70 years. So, the total age of the grandparents = 70 × 2 = 140 years

The average age of the parents is 40 years. So, the total age of the parents = 40 × 2 = 80 years

The average age of the grandchildren is 10 years. So, the total age of the grandchildren = 10 × 3 = 30 years

$\therefore$ The total age of the family members = 140 + 80 + 30 = 250 years.

$$\therefore \text{ The average age of the family} = \frac{250}{7} = 35\frac{5}{7} \text{ years}$$

Hence, option B is correct.

---

46. When 4 fair coins are tossed simultaneously, the total number of outcomes is 2^4 = 16
At least 3 heads implies that one can get either 3 heads or 4 heads.
One can get 3 heads in $^4C_3$ = 4 ways and can get 4 heads in $^4C_4$ = 1 ways.
$\therefore$ Total number of favorable outcomes = 4 + 1 = 5

$$\therefore \text{ The reqd. probability} = \frac{5}{16}$$

Hence, option C is correct.

47. Let the side of the square be s cm and the diameter of the circle be d cm.

∴ d = 2s + 1

Also, semi-perimeter = 2s = 14 cm

∴ d = 14 + 1 = 15 cm

∴ r = 15/2 = 7.5 cm

∴ Area = πr^2 = 3.14 × (7.5)^2 ≈ 177 sq.cm

Hence, option A is correct.

---

48. Let the Speed of Ramesh = x km/hr

Let the Speed of stream = y km/hr

∴ x + y = 15   **...(i)**

Now as a decreases of 66.66% is there

∴ x − y = $\left(\dfrac{100 - 66.66}{100}\right)$ × 15 = 5   **...(ii)**

Adding and subtracting (i) from (ii)

x = 10 km/hr

y = 5 km/hr

Now when stream speed will double ,upstream speed will be = x − 2y = 10 − (2 × 5) = 0 km/hr

Hence, option A is correct.

---

49. In case of right circular cone with vertex at top, the volume is directly proportional to height and square of base radius.

To fill the tank to half its height, the upper half will be empty.
The radius of base of empty half will be half of radius of base of tank and height will also be half.
⇒The volume of empty half of tank will be 1/8 of total volume of tank.
⇒We need to fill 7/8 of total tank.
Pipes can fill tank individually in 20 and 40 minutes.
⇒ In a minute, they can fill 1/20 and 1/40 of tank.
Let the time taken be T minutes.

$$\Rightarrow \frac{T}{20} + \frac{T}{40} = \frac{7}{8}$$

$$\frac{3T}{40} = \frac{7}{8}$$

⇒ 24T = 280

⇒ T = 11.67

∴ Time taken will be 11.67 minutes.

Hence, option B is correct.

50. Let the number of cricket balls purchased be 'x'

Price of each cricket ball = $\dfrac{1800}{x}$

Number of cricket balls that can be purchased if price of each ball Rs.10 cheaper = (x + 6)

Price of each cricket ball if each cricket ball was Rs.10 cheaper = $\dfrac{1800}{(x + 6)}$

$\Rightarrow \dfrac{1800}{x} - 10 = \dfrac{1800}{(x + 6)}$

$\Rightarrow \dfrac{(1800 - 10x)}{x} = \dfrac{1800}{(x + 6)}$

$\Rightarrow 1800x = (1800 - 10x)(x + 6)$
$\Rightarrow 1800x = 1800(x + 6) - 10x(x + 6)$
$\Rightarrow 1800x = 1800x + 10800 - 10x^2 - 60x$
$\Rightarrow 1800x - 1800x - 10800 + 10x^2 + 60x = 0$
$\Rightarrow 10x^2 + 60x - 10800 = 0$
$\Rightarrow 10(x^2 + 6x - 1080) = 0$

$\Rightarrow x^2 + 6x - 1080 = 0$
$\Rightarrow x^2 + 36x - 30x - 1080 = 0$
$\Rightarrow x(x + 36) - 30(x + 36) = 0$
$\Rightarrow (x + 36)(x - 30) = 0$

∴ x = 30   (∵   The value of 'x' can't be negative)

Hence, option C is correct.