



50 Most Important Application Sums (Arithmetic) for IBPS PO Prelims 2017

1) Pipe A and B can fill a tank in 15 minutes and 20 minutes respectively. Both the pipes are opened to fill a tank. The time when the tank should be full, it was found that a leak pipe was also opened along with pipes A and B. It is turned off immediately and then after 5 minutes, the tank gets full. Find the time in which the leak pipe can empty the full tank?

- A) $720/49$ minutes
- B) $728/49$ minutes
- C) $829/49$ minutes
- D) $832/49$ minutes
- E) None of these

2) Two mixtures A and B contain milk and water in ratio 7 : 1 and 6 : 1 respectively. 48 litres of mixture A is mixed with some quantity of mixture B and the resultant mixture C has milk and water in ratio 13 : 2. If 14 litres of mixture C is taken out, find the remaining quantity of mixture C.

- A) 79
- B) 72
- C) 75
- D) 76
- E) 71

3) A person wants to sell his chair and table. If he sells them at a total of Rs 525, he gets a profit of 20% on table and 10% on chair. But if he sells them at a total of Rs 510, he gets a profit of 10% on table and 20% on chair. Find the cost price of chair.

- A) Rs 250
- B) Rs 200

- C) Rs 150
- D) Rs 320
- E) Rs 270

4) A and B started a business. A invests Rs 400 less than B. A invests for 7 months while B invests for 8 months. If out of a total profit of Rs 7700, B got Rs 1100 more than A, then find the investment of B.

- A) Rs 2800
- B) Rs 2400
- C) Rs 2500
- D) Rs 2100
- E) Rs 2300

5) The difference between Simple Interest and Compound Interest after 3 years on a certain sum of money is Rs 12.16. If the rate % is 4% per annum, find the sum.

- A) Rs 2700
- B) Rs 3300
- C) Rs 3600
- D) Rs 2500
- E) None of these

6) Ratio between the ages of Shilpa and Meera is 4 : 5 and that between Shilpa and Sheetal is 2 : 3. If the sum of ages of Shilpa and Meera is one and a half times of the age of Sheetal. Find the total sum of ages of all three.

- A) 64
- B) 87
- C) 83



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- D) 76
E) Cannot be determined

7) A bucket contains 2 red balls, 4 blue balls, and 6 white balls. Two balls are drawn at random. What is the probability that either both are blue or both are non-blue?

- A) 5/11
B) 14/33
C) 12/33
D) 6/11
E) 17/33

8) Amit, Aman and Anil start a business by investing Rs 2500, Rs 3500 and Rs x respectively. They invest for 7 months, 5 months and 7 months respectively. If out of a total profit of Rs 6400, Anil got Rs 2400, find the total investment of all three.

- A) Rs 9150
B) Rs 9600
C) Rs 9000
D) Rs 9250
E) None of these

9) A vessel is in the form of a hemi-spherical bowl on which is mounted a hollow cylinder. The diameter of the sphere is 14 cm and the total height of vessel is 25 cm, find the capacity of the vessel.

- A) 3450.45 cu cm
B) 4450.28 cu cm
C) 3490.67 cu cm
D) 4950.49 cu cm
E) 3830.27 cu cm

10) The speed of boat A is 3 km/hr less than the speed of boat B. The time taken by boat A to travel a distance of 18 km downstream is 1 hour more than time taken by B to travel the same distance downstream. If the speed of the current is half of the speed of boat A, what is the speed of boat A?

- A) 4 km/hr
B) 10 km/hr
C) 9 km/hr

- D) 7 km/hr
E) None of these

11) Group A and Group B having some men have average ages 30 and 35 respectively. Both group A and B merge in a single group and their average becomes 33. If the total number of men in groups is 55, find the number of men in group A?

- A) 33
B) 28
C) 22
D) 38
E) None of these

12) There are two taps A and B which fill water and milk respectively. Tap A and B can fill the tank in 10 hours and 12 1/2 hours respectively. Tap A is opened in a tank which is already filled with 8% milk. After 2 hours, tap B is also opened and they both fill the tank. Now in what ratio should the mixture from this tank should be mixed with another mixture containing milk and water in the ratio 2 : 3, such that the resultant solution contains half milk and half water?

- A) 2 : 3
B) 1 : 1
C) 1 : 2
D) 2 : 5
E) None of these

13) 8 men can complete a work in 5 days. 12 women can complete in 10 days and 10 children in 24 days. 1 man, 1 woman and 1 child started the work. In how many days will the work get completed if the man did twice the work as woman and also twice the work as child?

- A) 10 days
B) 9 days
C) 12 days
D) 7 days
E) 13 days



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14) A rectangular plot has a path in the middle of the plot which is running parallel to the breadth of the plot. The area of rest of the plot leaving the path is 320 m^2 . If the width of the path is 4 m and length of path is greater than its width by 4 m, what is the area of rectangular plot?

- A) 412 m^2
- B) 426 m^2
- C) 395 m^2
- D) 352 m^2
- E) None of these

15) An article is marked at Rs 25,000. It was bought by the trader at successive discounts of 20% and 5%. After this he spent Rs 1,000 on its transportation and finally sold the article for Rs 25,000. What is his profit% in the whole transaction?

- A) $16 \frac{2}{3}\%$
- B) 28%
- C) 30%
- D) 25%
- E) 20%

16) In a business A invested Rs 7000 for 4 months, B invested Rs 8000 for 6 months and C invested Rs 9000 for 5 months. In the last 4 months of the year, they again invested certain amount as Rs 9000, Rs 7000 and Rs 8000 respectively. If at the end of year, a total profit earned is Rs 23,870, then what is the share of B?

- A) Rs 5500
- B) Rs 8280
- C) Rs 8360
- D) Rs 6400
- E) RS 9000

17) The ratio of present ages of A and B is in the ratio 7 : x. A is 12 years older than C. After 15 years, C's age will be 52 years. The sum of the present ages of A and B is 6 less than thrice C's present age. What is the value of x?

- A) 3
- B) 8

- C) 6
- D) 10
- E) None of these

18) A bag contains 3 white, 4 black and 5 green marbles. If 2 marbles are drawn at random from the bag, find the probability that both balls are different in color?

- A) $\frac{17}{44}$
- B) $\frac{69}{220}$
- C) $\frac{47}{66}$
- D) $\frac{13}{160}$
- E) $\frac{21}{170}$

19) 40 men can complete a work in 96 days. They all started the work, and after 24, days 20 more men joined. Some men left after further 32 days. If the remaining work now completed in 20 days, what is the number of men who left?

- A) 10
- B) 16
- C) 15
- D) 8
- E) 12

20) In a class there are 16 students in a group. If two more students are taken into consideration then the average of the age of group increases by 1. If four more students are taken into consideration then the average of the age of group decreases by 1. If there is a difference of 4 years in the total ages of students added both time, find the average of first 16 students in the group.

- A) 11
- B) 21
- C) 15
- D) 13
- E) 17

21) In an examination, 44% of students failed in subject A and 36% of the students failed in subject B and 18% failed in both the subjects. If 352 students passed in only one subject, then how many failed in both the subjects?



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- a) 126
- b) 144
- c) 156
- d) 158
- e) None of these

22) A shopkeeper allows two successive discounts of 10% and 5% on the marked price of an article but charges a sales tax of 5% on the discounted price. If a customer pays Rs. 718.2 as including the sales tax, then what is the marked price?

- a) 750
- b) 780
- c) 800
- d) 830
- e) None of these

23) Ram is $33\frac{1}{3}\%$ as efficient as Shyam. Gangu does 40% of the work done by Ram and Shyam together. If Gangu alone does the work in 60 days, in how many days Shyam and Gangu together can finish the same work?

- a) $20\frac{2}{3}$ day
- b) $25\frac{4}{5}$ day
- c) $20\frac{10}{23}$ day
- d) $20\frac{20}{23}$ days
- e) None of these

24) The ratio of present ages of A and C is 7 : 9 and present age of B is equal to the average ages of A and C after 2 years. If the ratio of present age of B and age of C after four years is 6 : 7 then what will be the ratio of age of A after four years to that of present age of B?

- a) 13 : 14
- b) 14 : 13
- c) 6 : 7
- d) 7 : 6
- e) None of these

25) In a two-digit numbers the digit in the unit's place is less than twice the digit in ten's place by 1 and the difference between the number obtained by interchanging its digit and the original number is

half the number by adding 7 to original number. Then the sum of its digit is.

- a) 11
- b) 9
- c) 7
- d) 13
- e) None of these

26) 7 litres are drawn from a beaker full of spirit then filled with water. The operation is performed 2 more times. The ratio of quantity of spirit now left in the beaker to that of water is 27 : 37. How much spirit did the beaker hold in original?

- a) 32 litres
- b) 28 litres
- c) 25 litres
- d) 26 litres
- e) None of these

27) A certain amount of money gets four times to its original amount after 24 years at a simple interest. What will be the interest on a sum of Rs.8500 compounded annually at the same rate of interest after 2 year?

- a) Rs. 2220.5
- b) Rs. 2150.75
- c) Rs. 2400.50
- d) Rs. 2257.6
- e) None of these

28) A square of area 64 m² is formed from a wire of certain length. If a rectangle is formed from the same wire, what will be its length, if length is $66\frac{2}{3}\%$ more than the width?

- a) 10 metre
- b) 12 metre
- c) 8 metre
- d) 8.5 metre
- e) None of these

29) A shopkeeper mixes of 24 kg of sugar worth Rs. 35 per kg with another quality of sugar of Rs.42 per kg. By selling the mixture at Rs. 41.04 per kg, he



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may gain 8%. How much sugar of second quality has been added to the mixture?

- a) 18 kg
- b) 32 kg
- c) 16 kg
- d) 28 kg
- e) None of these

30) A man can row $11\frac{2}{3}$ kmph in still water and finds that it takes six times more to row up than to row down the same distance in the river. What is the speed of the current?

- a) $7\frac{2}{3}$
- b) $5\frac{1}{3}$
- c) $5\frac{2}{3}$
- d) $8\frac{1}{3}$
- e) None of these

31) A shopkeeper bought a bat and sold it at a loss of 15%. If he had bought it for 20% less and sold it for Rs.147.2 more, he would have had profit of 35%. What is the cost price of bat ?

- a) Rs.540
- b) Rs. 600
- c) Rs.625
- d) Rs.640
- e) Rs.720

32) A work which can be completed by 24 men in 15 days, can also be completed by 30 women in 16 days. 10 men and 10 women start working and work for 16 days. How many more men are required to work to complete the remaining work in 1 day?

- A) 80
- B) 72
- C) 75
- D) 56
- E) 68

33) There are two containers filled with milk and water mixture. Capacity of containers is 18 litres and 12 litres respectively. They contain 35% water and 25% water respectively. If equal quantities from both the containers is mixed, then what will be

the percentage of water in final mixture?

- A) 11%
- B) 30%
- C) 15%
- D) 28%
- E) 22%

34) A solution contains milk and water in the ratio 3 : 1. 16 litres of the solution is drawn and 11 litres of water is added. If the final ratio of milk to water in the solution is 3 : 2, find the initial quantity of the solution.

- A) 65
- B) 54
- C) 45
- D) 60
- E) None of these

35) A and B invested Rs 5850 and Rs 6840. After 3 months, A added Rs 1650 and B withdrew Rs 840. If after a year, a total of Rs 41,800 is gained, what is the difference in the shares in the profit?

- A) Rs 1900
- B) Rs 2600
- C) Rs 2500
- D) Rs 1200
- E) Rs 1800

36) Ratio of age of A three years hence to age of B 5 years hence will be 4 : 5. C's age 7 years ago is two-thirds of A's age 9 years hence. Also, the average age of B and C is 26. Find the age of B.

- A) 18
- B) 25
- C) 22
- D) 28
- E) 20

37) Out of his monthly salary, Suhana spent 25% for her shopping of which she spent 80% in her food items. From the remaining salary, she spent two-eleventh on repair of furniture. If she saves Rs 14,400, what is her annual salary?

- A) Rs 5,34,000



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- B) Rs 4,80,000
- C) Rs 4,46,000
- D) Rs 3,25,000
- E) Rs 3,84,000

38) A rectangle has its length and breadth in the ratio 4 : 5. If the dimensions of the rectangle are each increased by 5 m and area of rectangle thus formed is 340 m^2 , then what is the perimeter of the original rectangle?

- A) 43 m
- B) 36 m
- C) 51 m
- D) 54 m
- E) 63 m

39) There are n students in a class whose average weight is x kg. If 2 more students having total weight 50 kg are also counted for average, the average gets increased by 1. If 3 more students having total weight 67 kg are also counted for average, then also the average gets increased by 1. Find the initial number of students in class.

- A) 18
- B) 17
- C) 16
- D) 15
- E) 19

40) Mohan takes 8 days less than the time taken by Ravi to finish a piece of work. If both Mohan and Ravi together can finish it in 7.5 days, then how many days Ravi will take to finish the work alone?

- a) 15 days
- b) 18 days
- c) 20 days
- d) 24 days
- e) 28 days

41) A sum of money doubles itself at Simple Interest in 10 years at some rate of interest. What interest will a sum of Rs 10,000 pay after 1 year at the same rate of interest?

- A) Rs 1,000

- B) Rs 1,200
- C) Rs 800
- D) Rs 1,500
- E) None of these

42) Two stations A and B are 287 km apart. Two trains started their journey from the two stations towards each other at 10 PM. After three and half hours they crossed each other. If the speed of the faster train is 6 km/hr more than the speed of the slower train, then find the speed of the faster train.

- A) 44 km/hr
- B) 38 km/hr
- C) 40 km/hr
- D) 46 km/hr
- E) 35 km/hr

43) Mr. X invested in a saving scheme which offers an interest rate of 8% compounded annually. The maturity period of the scheme is 3 years. But 1 year before the maturity period Mr. X withdrew his amount. For this premature withdrawal, the issuer bank deducted 1% of the total amount payable to Mr. X for that period. If after deduction Mr. X got Rs 11,54,736 then find his total investment.

- A) Rs 9,50,000
- B) Rs 9,00,000
- C) Rs 10,00,000
- D) Rs 10,50,000
- E) None of these

44) A boat travels a distance downwards from Point A to Point B and then moves upwards from point B back to point A. The speed of boat in still water is 5 kmph while the normal speed of stream is 1 kmph. Find the time taken by the boat to travel the whole distance to and fro if the speed of the stream doubles in the return journey (From B to A). The distance between A to B is 10 km

- A) 8 hours
- B) 9 hour 30 minutes
- C) 5 hours
- D) 7 hours



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E) 8 hour 40 minutes

45) Train X travelling at a speed of 72 kmph crosses a platform of equal length in 15 seconds more than it takes to cross a signal post. In how much time will another train Y of length 450 meters travelling at a speed of 36 kmph and Train X cross each other while moving towards each other?

- A) 30 second
- B) 25 second
- C) 20 second
- D) 15 second
- E) None of these

46) A dishonest shopkeeper Mr.X marks his good 10% above the Cost Price and also uses a false weight of 900 grams instead of 1 kg. One day his rival shopkeeper replaced this false weight of 900 grams with a weight of 1100 grams, so that Mr. X incurs loss. Find the % Gain/Loss that Mr. X will incur after the weight is replaced.

- A) 5 % Profit
- B) 5 % Loss
- C) 10% Profit
- D) 10 % Loss
- E) No Profit No Loss

47) Mr. X can do a work in few days. Mr. Y who is twice as efficient as Mr. X can do the same work in 10 days. Find the number of days in which Mr. X, Mr. Y and Mr. Z will complete the work together if Mr. Z is half as efficient as Mr. X

- A) 15 days
- B) 40/7 Days
- C) 36/7 Days
- D) 8 days

E) None of these

48) A man and his wife appear in an examination for two vacancies for the same post. The probability of husband's selection is (1/6) and the probability of wife's selection is (1/4). What is the probability that only one of them is selected?

- A) 1/3
- B) 1/4
- C) 1/5
- D) 1/6
- E) None of these

49) A square field which was newly built incurred a total cost of Rs 16,000 in fencing at a rate of Rs 50 per meter. But later it was realized that the field has been wrongly constructed, and the new dimension of field should be 100 meter * 80 meter. What is the minimum possible cost that will be incurred for fencing the extra part of field at the same rate.

- A) Rs 8,000
- B) Rs 5,000
- C) Rs 6,000
- D) Rs 10,000
- E) Rs 18,000

50) The age of Mr X will double in 30 years. B is the sister of Mr. X and is 5 year younger to him. B is married to Mr. Z who is 5 year elder to Mr. X What will be the average Age of B and Mr. Z after 10 years?

- A) 30
- B) 35
- C) 40
- D) 45
- E) None of these

Solutions

1) A

Pipes A and B can fill the tank in $15 \times 20 / (15 + 20) = 60/7$ minutes

But along with leak pipe, it took 5 minutes more. Let

leak pipe can empty tank in x minutes

So A and B were opened for $(60/7) + 5 = 95/7$ minutes

And the leak was opened for 60/7 minutes

So $(7/60) \times 95/7 - (1/x) \times 60/7 = 1$



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Solve, $x = 720/49$ minutes

2) D

Milk in A = $7/8$, in B = $6/7$ and in C is $13/15$

So by allegation method

(48 l).....(x l)

$7/8$ $6/7$

..... $13/15$

$1/105$ $1/120$

So ratio is $1/105 : 1/120 = 8 : 7$

So, $48/x = 8/7$

$x = 42$ l

So quantity of C = $48+42 = 90$, SO after 14 l is removed,

Remaining = $90 - 14 = 76$

3) C

When the profit % gets reversed, following formula can be used.

Cost price of (table + chair) = $[(525+510)]/(110\% + 120\%) = 1035/(1.10 + 1.20) = 450$

And Cost price of (table - chair) = $[(525 - 510)]/(120\% - 110\%) = 15/(1.20 - 1.10) = 50$

Solve both equations, CP of chair = Rs 150

4) A

A's investment = Rs x so B's investment = $(x+400)$

So ratio of shares of A and B is

$x * 7 : (x+400) * 8$

Now according to question, $(x+400) * 8/[15x + 3200] * 7700$

$7700 = 1100 + 7x/[15x + 3200] * 7700$

So, $(x+400) * 8/[15x + 3200] * 7700 - 7x/[15x + 3200] * 7700 = 1100$

$8x + 3200 - 7x = 1100$

Gives $[8x + 3200 - 7x] / [15x + 3200] * 7700 = 1100$

Gives $[x + 3200] / [15x + 3200] = 1/7$

Solve, $x = Rs 2400$

5) D

Formula for difference between SI and CI for 3 years

Difference = $P * r^2/100^2 * (300+r)/100$

So $12.16 = P * 16/10000 * 304/100$

So $P = 1216 * 10000/(16 * 304) = 76*100*100/304 = Rs 2500$

6) E

Meera/Shilpa = $5/4$ and Shilpa/Sheetal = $2/3$

So Meera : Shilpa : Sheetal = $5*2 : 4*2 : 4*3 = 5 : 4 : 6$

Also given = (Shilpa + Meera) = $3/2 * Sheetal$

So $(4x + 5x) = 3/2 * (6x)$ gives $9x = 9x$, so cannot be determined

7) E

Two cases

Case 1: both are blue

Probability = ${}^4C_2 / {}^{12}C_2 = 3/33$

Case 2: both non-blue (means red or white)

Probability = ${}^8C_2 / {}^{12}C_2 = 14/33$.

Add both cases

$3/33 + 14/33 = 17/33$

8) C

Ratio of shares of Amit : Aman : Anil is

$2500*7 : 3500*5 : x*7$

$= 2500 : 2500 : x$

So $x/(5000+x) * 6400 = 2400$

Solve, $x = Rs 3000$

So total investment = $2500 + 3500 + 3000 = Rs 9000$

9) C

Diameter is 14, so radius is 7 cm

Total height = 25 cm, so height of cylinder = $25-7 = 18$ cm (because height of hemisphere is same as its radius)

Capacity of vessel = volume of cylinder + volume of hemisphere

So $= \pi r^2 h + 2/3 * \pi r^3$

$= 22/7 * 7 * 7 * 18 + 2/3 * 22/7 * 7 * 7 * 7$

$= 2772 + 718.67$

$= 3490.67$ cu cm

10) A

Speed of A = x, then of B = $x+3$

Speed of current = $x/2$

So downstream speed from boat A = $x + x/2 = 3x/2$

downstream speed from boat B = $x+3 + x/2 = 3x/2 + 3$

so $18/(3x/2) = 18/(3x/2 + 3) + 1$

$36/3x = 36/(3x+6) + 1$



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$$12/x = 12/(x+2) + 1$$

$$12(x+2) = 12x + x(x+2)$$

$$x^2 + 2x - 24 = 0$$

solve, $x = 4$

11) C

Let number of men in group A and B be x and y respectively

$$\text{So } 30x + 35y = 33(x+y)$$

Solving this gives $x/y = 2/3$

$$\text{So number of men in group A} = 2/(2+3) * 55 = 22$$

12) B

Let total capacity of tank = 100 litre

Given tank is already contain 8% milk

First Tap A runs for 2 hr. means tank fill by water

$$2/10 = 1/5 \text{ part or } 20\% \text{ water in it}$$

Now 20 l water and 8 l milk in tank

Next 72% part of tank still empty

Both Tap A and B can fill full tank in $1/10 + 1/12.5 =$

$$9/50 \text{ means } 50/9 \text{ hr}$$

So 72% part fill by tank A and B = $72/100 * 50/9 = 4\text{hr}$

After this water in tank = $4/10 * 100 = 40\%$ and milk =

$$4/12.5 * 100 = 32\%$$

So Total water in tank = $20+40 = 60\text{l}$ and milk in tank = 40l

So Water : Milk ratio = 3 : 2

Given ratio water : milk = 2 : 3

So by method of allegation:

$$3/5 \text{-----} 2/5$$

$$\text{-----} 1/2$$

$$1/10 \text{-----} 1/10$$

So Water : Milk ratio = 1 : 1

13) A

Man did twice work from woman and child both. This means woman and child did equal work and Man twice of that. So $2x + x + x = 1$, $x = 1/4$

Woman did $1/4$ of work, child did $1/4$ of work and man $2*(1/4) = 1/2$ of work

8 m in 5 days, so 1 man in 40 days, so $1/2$ work in 20 days.

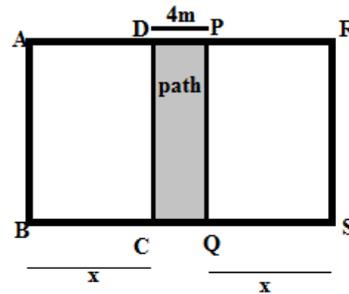
12 w in 10 days, so 1 woman in 120 days, so $1/4$ work

in 30 days.

10 c in 24 days, so 1 child in 240 days, so $1/4$ work in 60 days.

So required – $1/20 + 1/30 + 1/60 = 1/10$ or 10 days

14) D



See the figure

Path of 4 m wide is in the middle parallel to breadth, length of path which is breadth of rectangular plot is $4+4 = 8\text{m}$

Path is in the middle, so $BC = QS = x\text{ m}$

Now area of rest of the plot leaving the path is 112 this means area of ABCD + area of PQRS is

$$\text{So } x*8 + x*8 = 320$$

Solve, $x = 20$

So length of plot is $20+4+20 = 44$, breadth is 8

So area = $44*8$

$$= 352\text{m}^2$$

15) D

Successive discounts of 20% and 5% makes overall discount of $(-20) + (-5) + (-20)(-5)/100 = -25 + 1 = -24\%$

So he bought the article for $[(100-24)/100] * 25000 = 19,000$

Spent 1000 on repairs, so total CP = $1000 + 19000 = 20,000$

SP = 25,000

So profit% = $(5000/20000) * 100$

$$= 25\%$$

16) C



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Ratio of shares of A : B : C is

$$7000*4 + 9000*4 : 8000*6 + 7000*4 : 9000*5 + 8000*4$$

$$7*4 + 9*4 : 8*6 + 7*4 : 9*5 + 8*4$$

$$64 : 76 : 77$$

$$\text{So B got} = (76/217) * 23,870 \\ = \text{Rs } 8360$$

17) B

After 15 years, C's age is 52 years, so present age of C is 37

A is 12 years older than C, so A's present age = 37+12 = 49

Sum of present ages of A and B is 3*C's-6 so 49+B = 3*37-6, so B = 56

$$\text{So } A/B = 49/56 = 7/8$$

$$\text{So, } x = 8$$

18) C

Case 1: 1 white+1 black

$${}^3C_1 * {}^4C_1 / {}^{12}C_2$$

Case 2: 1 white+1 green

$${}^3C_1 * {}^5C_1 / {}^{12}C_2$$

Case 3: 1 green+1 black

$${}^5C_1 * {}^4C_1 / {}^{12}C_2$$

Add all cases

$$12 + 15 + 20 / 132/2$$

$$= 47/66$$

19) E

Shortcut:

$$40*96 = 40*24 + 60*32 + (60-x)*20$$

$$\text{Solve, } x = 12$$

OR

40 men complete work in 96 days. So 60 men in

$$(40*96)/60 = 64 \text{ days}$$

40 men worked for 20 days, after this (40+20) = 60 men worked for 32 days, after this (60-x) men completed the work in 20 more days.

Let these (60-x) men completes 1 work in y days.

$$\text{So } (1/96)*24 + (1/64)*32 + (1/y)*20 = 1$$

$$\text{Solve, } y = 80$$

This means (60-x) men complete 1 work in 80 days

$$M1*D1 = M2*D2$$

$$40*96 = (60-x)*80$$

$$\text{Solve, } x = 12$$

20) E

Let n is average of group of initial 16 people.

Cross multiplication method:

$$16 \dots \dots \dots n$$

$$18 \dots \dots \dots (n+1)$$

$$\text{So total if ages of 2 people added} = 2*(n+1) + 16$$

AND

$$16 \dots \dots \dots n$$

$$20 \dots \dots \dots (n-1)$$

$$\text{So total if ages of 4 people added} = 4*(n-1) - 16$$

Now given

$$2*(n+1) + 16 - 4*(n-1) - 16 = 4$$

$$\text{Solve, } n = 17$$

Other method:

$$\text{Total of ages of 16 people} = 16n$$

$$\text{Total of ages of 18 people becomes} = 18*(n+1)$$

$$\text{So total ages of 2 people added} = 18*(n+1) - 16n = 2n + 18$$

Now

$$\text{Total of ages of 20 people becomes} = 20*(n-1)$$

$$\text{So total ages if 4 people added} = 20*(n-1) - 16n = 4n - 20$$

Now given:

$$2n + 18 - (4n - 20) = 4$$

$$\text{Solve, } n = 17.$$

21) B;

Students passed in one subject also means that they have failed in one subject. % of no of student passed in one subject only = 26 + 18 = 44%

$$44\% - 352$$

$$100\% - 800$$

$$\text{Total Students} - 800$$

$$\text{Failed in both} - 800 \times 18/100$$

$$= 144$$

22) C;



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$$\begin{aligned} \text{Total discount} &\Rightarrow -10 - 5 + \frac{10 \times 5}{100} \\ &\Rightarrow 14.5\% \\ \therefore SP + SP \times \frac{5}{100} &= 718.2 \\ \text{or, } \frac{105}{100} SP &= 718.2 \\ \text{or, } SP &= \frac{71820}{105} \\ \therefore SP &= 684 \\ \text{Now, marked price} &= \frac{684}{(100 - 14.5)} \times 100 \\ \text{Marked price} &= 800 \end{aligned}$$

23) D

Ratio of efficiency Ram to Shyam = $33 \frac{1}{3} : 100$
= 1 : 3

Ratio of no of days to complete the work = 3 : 1

$$\begin{aligned} \text{Ram and Shyam can do it in} &= \frac{40}{100} \times 60 \\ &= 24 \text{ days.} \end{aligned}$$

Let the number of days to complete the work by Ram and Shyam be $3x$ and x day respectively.

$$\text{Then, } \frac{1}{x} + \frac{1}{3x} = \frac{1}{24} \quad \therefore \frac{4}{3x} = \frac{1}{24}$$

$$\therefore x = 32 \text{ day}$$

Shyam + Gangu 1 day's work

$$\frac{1}{60} + \frac{1}{32} = \frac{23}{480}$$

$$\text{Total number of days} = 20 \frac{20}{23} \text{ days.}$$

24) A

Let the ages of A and C be $7x$ and $9x$

$$B = \frac{7x + 2 + 9x + 2}{2} = 8x + 2$$

$$\text{Given, } \frac{8x + 2}{9x + 4} = \frac{6}{7} \quad \therefore x = 5$$

$$\begin{aligned} \text{Age of } A &= 35 \\ B &= 42 \\ C &= 45 \end{aligned}$$

$$\therefore \text{Required} = \frac{35 + 4}{42} = \frac{39}{42} = 13 : 14$$

25) A

Let the unit digit be y and ten digit be x

Then,

$$y = 2x - 1 \quad \dots\dots\dots (I)$$

$$\begin{aligned} \text{Difference} &= 10y + x - (10x + y) \\ &= 9y - 9x \end{aligned}$$

$$\text{Now, } 9(y - x) = \frac{10x + y + 7}{2}$$

$$\text{or, } 17y - 28x = 7 \quad \dots\dots\dots (II)$$

Solving (I) & (II) $x = 4, y = 7$

Number = 47

Sum = $4 + 7 = 11$

26) B

Let the volume of beaker be V lts.

$$\text{or, } \frac{27}{64} = \left(\frac{V - 7}{V} \right)^3$$

$$\text{or, } \frac{3}{4} = \frac{V - 7}{V}$$

$$\text{or, } 3V = 4V - 28$$

$$\therefore V = 28 \text{ Lts.}$$

27) D

300% increase in = 24 years

In one year = $300/24 = 12.5\%$

Rate of interest = 12.5

$$\begin{aligned} \text{Total compound interest} &= 12.5 + 12.5 + \frac{12.5 \times 12.5}{100} \\ &\approx 26.5625 \end{aligned}$$

$$\therefore \text{C. I} \approx 8500 \times \frac{26.56}{100} = \text{Rs. } 2257.6$$

28) A



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So $(35 - x)/(x - 25) = 1$

Solve, $x = 30$ l

OR

Let x litres from both is taken

So final is $x+x = 2x$ litres

So % = $(35\% \text{ of } x + 25\% \text{ of } x)/2x * 100 = 30\%$

34) D

Let total solution = $3x + x + 16 = 4x + 16$

Now 12 l water added, so

$3x/(x+12) = 3/2$

Solve $x = 11$

So total initial solution = $4 * 11 + 16 = 60$

OR

Initially milk and water is $3x$ and x respectively

16 litres withdrawn:

Remaining Milk = $3x - 3/4 * 16 = 3x - 12$

Remaining Water = $x - 1/4 * 16 = x - 4$

11 litres water added, so

Remaining Milk = $3x - 12$

Remaining Water = $x - 4 + 11 = x + 7$

Now $(3x - 12)/(x + 7) = 3/2$

Solve, $x = 15$

So total initial solution is $3x + x = 4x = 4*15 = 60$

35) A

A : B

$5850 * 3 + 7500 * 9 : 6840 * 3 + 6000 * 9$

$65 * 3 + 750 : 76 * 3 + 600$

189 : 207

21 : 23

So difference = $(23-21)/(21+23) * 41800 = \text{Rs } 1900$

36) B

$(A+3)/(B+5) = 4/5$

$(C - 7) = 2/3 * (A + 9)$

$B + C = 2 * 26 = 52$

Solve the equations, $B = 25$

37) E

Let monthly salary of Suhana is x

25% in shopping so 25% of $x = x/4$ in shopping

of which 80% in food items so, in food items = 80% of

$x/4 = x/5$

So remaining salary = $x - (x/4 + x/5) = 11x/20$

Spent 2/11 on repair of furniture, so $1 - 2/11 = 9/11$ is saved

So $9/11 * (11x/20) = 14400$

Solve, $x = \text{Rs } 32,000$

So annual salary = $12 * 32,000 = \text{Rs } 3,84,000$

38) D

$4x, 5x$

$(4x+5)(5x+5) = 290$

$20x^2 + 45x + 25 = 340$

$20x^2 + 45x + 25 = 340$

$20x^2 + 45x - 315 = 0$

$4x^2 + 9x - 63 = 0$

$4x^2 - 12x + 21x - 63 = 0$

Solve, $x = 3$

So old perimeter = $2 * (4x+5x) = 18x = 18 * 3 = 54\text{m}$

39) C

Case 1:

$n \dots \dots \dots x$

$(n+2) \dots \dots \dots (x+1)$

So $(x+1) * 2 + n * 1 = 50$

$2x + n = 48$

Case 2:

$n \dots \dots \dots x$

$(n+3) \dots \dots \dots (x+1)$

So $(x+1) * 3 + n * 1 = 67$

$3x + n = 64$

Solve both equations, $n = 16$

40) C

Let Ravi takes 'x' days to finish the work, so Mohan will take $(x - 8)$ days to finish the work.

$(1/x) + [1/(x - 8)] = 2/15$ (i. e Ravi + Mohan 1 day work)

$(2x - 8) / (x^2 - 8x) = 2/15$ $(x - 4) * 15 = x^2 - 8x$

$x^2 - 23x + 60 = 0$ $x^2 - 20x - 3x + 60 = 0$

$x(x - 20) - 3(x - 20) = 0$

$x = 20, 3$

We discard $x = 3$ as it is less than 8.

$x = 20$ days



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41) A

Here $A = 2P \Rightarrow P = SI$

$$P = (P \cdot r \cdot 10) / 100 \Rightarrow$$

$$r = 10\%$$

\Rightarrow Interest Rs 1000

42) A

Relative speed of both trains = $287 / 3.5 = 82$ km/hr

If they were moving at the same speed, means each travelling at $82 / 2 = 41$ km/hr

But difference in speed of trains is 6 km/hr.

So add $6 / 2 = 3$ to 41 for speed of faster train and subtract 3 from 41 for speed of slower train.

So faster train's speed = $41 + 3 = 44$ km/hr, and of slower = $41 - 3 = 38$ km/hr

43) C

Rs 11,54,736 is 99% of the total amount without deduction. (If 1 % was not deducted)

$$100\% = 1154736 \cdot 100 / 99 = \text{Rs. } 11,66,400$$

Using this as amount find the principle for 2 years and rate of 8%

$$P = 1166400 / 1.1664 = \text{Rs } 10,00,000$$

44) C

$$T = 10 / [(5+1)] + 10 / [(5-2)]$$

$$T = 5 \text{ hours}$$

45) B

Let length of train X = Length of platform = X kmph.

$$2X / 20 - X / 20 = 15 \text{ [72 kmph = 20 m/s]}$$

$$\Rightarrow X = 300 \text{ m}$$

$$T = (300 + 450) / (20 + 10) \text{ [m/s equivalent of kmph]}$$

$$T = 25 \text{ second}$$

46) E

$$1000 / 1100 = (100 + G) / (100 + 10)$$

$$= G = 0\%$$

47) B

Y \rightarrow 10 days ;

X \rightarrow 20 days (Y is twice efficient as X)

Z = 40 days

$$1 / \text{days} = 1 / 10 + 1 / 20 + 1 / 40$$

$$\Rightarrow \text{Days} = 40 / 7$$

48) A

$$P(\text{Man selected}) = 1/6 ; P(\text{Man not selected}) = 1 - 1/6 = 5/6$$

$$P(\text{Wife selected}) = 1/4 ; P(\text{Wife not selected}) = 3/4$$

Required Probability = (Man selected & Wife not selected) OR (Wife selected & Man not selected)

$$= (1/6 \cdot 3/4) + (1/4 \cdot 5/6)$$

$$= 1/3$$

49) C

$$\text{Perimeter of field} = 16000 / 50 = 320$$

$$\Rightarrow \text{side of square} = 80 \text{ meter}$$

Now the total cost will be minimum, when one of the side of the field is demolished and extended by 20 m on its length to get the total length of 100 m, and then the 80 m demolished boundary is constructed.

So the total length now to be fenced = $20 + 80 + 20$ meter = 120 meter

$$\text{Total cost} = 120 \cdot 50 = \text{Rs } 6,000$$

50) C

$$\text{Age of X} = x$$

$$x + 30 = 2x$$

$$\Rightarrow x = 30$$

$$B = 25 ; Z = 35$$

$$\text{After 10 years total age} = 25 + 10 + 35 + 10 = 80$$

$$\text{Average} = 40 \text{ years}$$

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