What is the capacity of the tank?

N. Vinaykumar Reddy
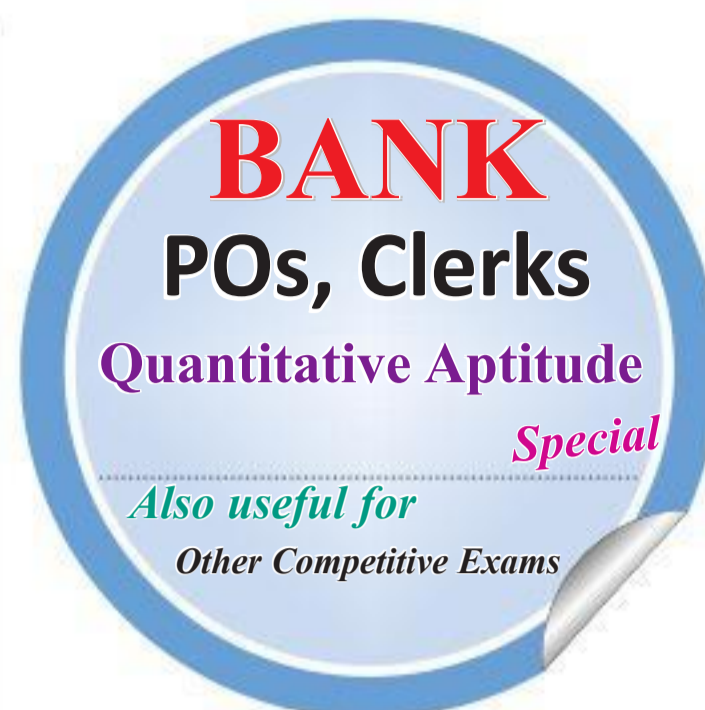
Director, IACE, Hyderabad.

MODEL QUESTIONS

1. The ratio of area of a rectangle to that of a square is 3 : 5. If the perimeter of the square is 100 cm then what can be the perimeter of the rectangle if the breadth of the rectangle is 66.67% more than that of length?
   a) 75 cm   b) 80 cm
   c) 85 cm   d) 65 cm
   e) None of these

2. Kelvis got some money. He can buy either 60 mangoes or 40 apples with that money. If he wants to save 10% of the total money and buy 20 apples and x mangoes with the remaining money, then total how many fruits (Apples + Mangoes) did he buy?
   a) 48   b) 44
   c) 45   d) 41
   e) None of these

3. Two friends, Seeta and Geeta start running from the same point P in the same direction at 7 : 00 am and 8 : 00 am respectively. At 10 : 30 am the first time Geeta catches Seeta and at 12 : 15 PM on the same day, reach other Point Q in the same straight line. At what time, will Seeta reach the point Q?
   a) 1 : 12 PM   b) 1 : 07 PM
   c) 12 : 57 PM   d) 12 : 45 PM

4. Ram takes 10 hours more to complete a piece of work than that of Ramya. If they work together then by what percentage should Ramya decrease her efficiency so both of them complete the work in 20 hours and both of them had completed the piece of work in equal proportion?
   a) 20%   b) 25%
   c) 40%   d) 50%
   e) None of these

5. A rectangular floor of length 80 cm and width 60 cm was fully covered with equal size square tiles of sides 4 cm. If the price of one such tile is Rs. 15 then total how much money will be required to cover the floor with tiles?
   a) Rs. 4500   b) Rs. 6000
   c) Rs. 3000   d) Rs. 7500
   e) None of these

6. Solve 30% of 300 + x% of 50 = 60% of 400
   a) 600   b) 300
   c) 800   d) 100
   e) None of these

7. The marked price of a mobile phone is Rs. 6000 more than the cost price. If the mobile phone was sold at 15% discount on the marked price then the gain was Rs. 3000. By what percentage above the cost price the mobile phone should be sold to gain Rs. 4200?

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   a) 25%   b) 30%
   c) 20%   d) 24%
   e) None of these

8. X years ago, Rohini's age was one fourth of the age of her father. X years hence, Rohini's age will become half of the age of her father. At present, Rohini's age is what percent of her father's age?
   a) 33.33%   b) 30%
   c) 60%   d) 50%
   e) None of these

9. An inlet pipe P can fill a water tank in 12 hours and Pipe Q which is at the bottom of water tank can drain the same tank at the rate of 25 litres per minute. If both the pipes were opened alternately for one hour each starting with pipe P then the water tank was filled in 67 hours. What is the capacity of the tank?
   a) 25000 litres
   b) 32000 litres   c) 30000 litres
   d) 27000 litres

10. In a school, there are two students: one boy and one girl. The class teacher distributes some number of books between the two students. If each student is eligible for any number of books then the number of ways the class teacher can distribute the books is 1024. Find how many books the class teacher has?
   a) 12   b) 8
   c) 10   d) 32
   e) None of these

11. A can paint ceiling of a room of length 5 cm and breadth 12 cm in 12 hours but B can paint ceiling of a room of length 10 cm and breadth 5 cm in 10 hours. How long A and B together will take to paint ceiling of a room of length 15 cm and breadth 20 cm?
   a) 45 hours   b) 20 hours
   c) 60 hours   d) 30 hours
   e) None of these

12. A and B started a business by investing in the ratio of 7: 10. C joins after 3 months with the investment one and a half of that of A. At the end of 1 year, out of the total profit, C's share was Rs. 12600, then what was the total profit (in Rs.)?
   a) 39600   b) 39800
   c) 36400   d) 41200
   e) None of these

Solutions

1. b;
The side of the square
$\frac{100}{4} = 25$cm
The area of the square = 25×25 = 625 sq. m.
The area of the rectangle
$= \frac{3 \times 625}{5} = 375$ sq. m.
Let the length = of the rectangle = 3x and breadth of the rectangle = 166.67% of 3x = 5x
then perimeter = 2(l + b)
And area = 375 = 3x × 5x
x = 5 cm
Perimeter = 2(3x + 5x) = 16x
= 80 cm

2. b;
Let Kelvis got Rs. 100x
Then the price of one mango
$= \frac{100x}{60} = \frac{5x}{3}$
The price of one apple
$= \frac{100x}{40} = 2.5x$
The total money he spends after saving 10% = (100 - 10)% of 100x = 90x
The price of 20 apples = 20 × 2.5x = 50x
The remaining money
= 90x − 50x = 40x
Let y number of mangoes he purchases
Then, $= \frac{5x \times y}{3} = 40x$
Y = 24
the total no of fruits he purchased= 20 + 24 = 44 fruits

3. c; Let at 10: 30 they meet the first time at the point R then
The distance travelled by Sita in 3 hour 30 minutes at the speed of x km per hour = 3.5 × x km
The distance travelled by Geeta in 2 hour 30 minutes at the speed of y km per hour = 2.5 × y km
According to the question, 3.5x = 2.5y
x : y = 5 : 7
Let the speed of Seeta = 5a km per hour then the speed of Geeta = 7a km per hour
The total distance travelled by Geeta from 10 : 30 am to 12 : 15 pm
= 1 hr 45 minutes = $\frac{7}{4}$ hour
$\frac{7a \times 7}{4} = \frac{49a}{4}$ km
The time taken by Seeta to travel the same distance =
distance = speed × time
$\frac{49a}{4} = 5a \times t$
T = $\frac{49}{20}$ hours = $\frac{49 \times 60}{20}$ minutes
= 147 minutes = 2 hour 27 minutes
At the time, Seeta will reach Q
= 10 : 30 + 2 hour 27 minutes
= 12 : 57 PM

4. b;
Let Ramya takes x hour to complete the work then Ram will take x + 10 hours to complete the same work both of them complete the work in 20 hours and both of them

had competed the piece of work in equal proportion it means
Ram does half of the work in 20 hours and Ramya does half of the Work in 20 hours.
Ram will do the complete work in 20 × 2 = 40 hours and Ramya with new efficiency will do the complete work in 20 × 2 = 40 hours
There is no change in the efficiency of Ram it means x + 10 = 40
x = 30 hours
It means with the original efficiency Ramya can complete the work in 30 hours but with the new efficiency she does in 40 hours
Efficiency is inversely proportional to time
Ramya's original efficiency: Ramya's new efficiency = 40 : 30 = 4 : 3
The required% change
$= \frac{(4 - 3) \times 100}{4} = 25\%$

5. a;
The number of square tiles required
$= \frac{\text{area of the rectangle}}{\text{area of one square}}$
$= \frac{80 \times 60}{4 \times 4} = 15 \times 20 = 300$ titles
The price of one title = Rs. 15
Therefore, the price of 300 tiles = 15 × 300 = Rs. 4500

6. b;
30% of 300 + x% of 50 = 60% of 400
90 + (x/2)=240

x/2 = 150
x = 300

7. b;
Let CP = Rs. 100x then MP
= Rs. (100x + 6000)
SP = (100 − 15)% of(100x + 6000) = 85x + 5100 = 100x + 3000
15x = 2100
x = 140
Therefore, CP = 100x = Rs. 14000
The reqd. answer
$= \frac{4200 \times 100}{14000} = 30\%$

8. e; X years ago, let Rohini's age = a years then her father's age = 4a years
X years hence, let Rohini's age = a + 2X years then her father's age = 4a + 2X years
According to the question,
$\frac{a + 2X}{4a + 2X} = \frac{1}{2}$
2a + 4X = 4a + 2X
X = a
At present, the ratio of their age = (a + X) : (4a + X) = 2 : 5
The required % $= \frac{2 \times 100}{5} = 40\%$

9. d; Let pipe Q can empty the tank in x hours then
The part of the tank filled in the first 2 hours = $\frac{1}{12} - \frac{1}{x}$ part
The part of the tank filled in the first 66 hours = $\frac{33}{12} - \frac{33}{x}$
The part of the tank filled in 67 hours = $\frac{34}{12} - \frac{33}{x} = 1$

By solving. x = 18 hours = 18 × 60 minutes
The capacity of tank = 18 × 60 × 25 = 27000 litres

10. c;
Each student is eligible for any number of books then let the number of books = x
Therefore, 2x = 1024
x = 10 = The number of books the class teacher has.

11. d; We know that,
$\frac{M_1 D_1}{W_1} = \frac{M_2 D_2}{W_2}$
Or, $M_1 D_1 W_2 = M_2 D_2 W_1$
A × 12 × (10 × 5) = B × 10 × (12 × 5) (Where 10 × 5 and 12 × 5 is the area of the ceiling of the rooms)
A : B = The ratio of efficiency = 1 : 1
Now, A and B together can paint the area of 60 cm2 in $\frac{12}{2}$
= 6 hours
The time taken by A and B together to paint
15 × 20 cm^2
$= \frac{6 \times 15 \times 20}{60} = 30$ hours

12. b; Let the investment of A = Rs. 7x then the investment of B = Rs. 10x and the investment of C = 1.5 × 7x = Rs. 10.5x
The ratio of share = 7x × 12 : 10x × 12 : 10.5x × 9
= 28 : 40 : 31.5
C's share = 31.5x = 12600
x = Rs 400
Total profit = (28x + 40x + 31.5x) = 99.5x = Rs 39800