



GENERAL APTITUDE

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Ratio & Proportion(Poll)

Q. The incomes of A & B are in the ratio 3:2. Their respective expenditures are in the ratio 5:3. If each of them saves Rs. 2000, what is the income of B?

A. Rs 12,000 B. Rs 8,000 C. Rs 16,000 D. Rs 6,000

Ans : B



Probability

- How likely an event is supposed to happen.
- Probability = $\frac{\text{Favourable outcome}}{\text{Total number of outcomes}}$
- AND → multiply(x) e.g:- 1 green and 1 blue ball in a box
- OR → Add (+) e.g:- 1 red or 1 blue ball in a box
- 1 bag has 3 balls, what is the probability of you picking up 2 balls?

$$\bullet \quad {}^3C_2 = \frac{3 \times 2}{1 \times 2} = 3$$

Total no. of balls
the bag contains

Out of which how many balls
We need to choose
(tells number of times 3 has to be reduced)

$$\text{Probability} = \frac{\text{Favourable outcome}}{\text{Total number of outcomes}}$$



Points to Remember

- The **probability** of an event will not be less **than** 0.
- This is because 0 is impossible (sure that something will not happen).
- The **probability** of an event will not be **more than** 1. This is because 1 is certain that something will happen.
- The probability of an event is **a number** describing the chance that the event will happen.
- An event that is certain to happen has a probability of 1.
- An event that cannot possibly happen has a probability of 0.
- If there is a chance that an event will happen, then its probability is between 0 & 1.



Probability

- **Atleast** – min to max

- Eg:- 2 bags out of 3



So various probabilities to be done is 2 and 3

- **Atmost** - max to min

- Eg:- 1 bag has 3 balls out of which probability to pick up 2 balls

A diagram illustrating the 'Atmost' concept. It shows the text 'probability to pick up 2 balls'. Below '2' is a blue arrow pointing down to the text 'atmost 2'. To the right of 'atmost 2' is an arrow pointing to the text 'max 2 , 1 , 0 (min)'.

atmost 2 → max 2 , 1 , 0 (min)



Probability

Q. A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

A. 10/21 B. 11/21 C. 2/7 D. 5/7

• Soln-

- Total balls = 2+3+2 =7 balls in the bag
- None = blue (neglect whichever color is written after none)
- Draw =2 balls

• Probability = $\frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{2R \text{ or } (1R \text{ and } 1G) \text{ or } 2G}{7C_2} = \frac{2C_2 + (2C_1 \times 3C_1) + 3C_2}{7C_2} = \frac{10}{21}$

Ans : A



Probability

Q. In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?

A. $\frac{1}{3}$ B. $\frac{3}{4}$ C. $\frac{7}{19}$ D. $\frac{8}{21}$ E. $\frac{9}{21}$

Soln:

- Total balls = $8+7+6 = 21$ balls in the box
- Neither red nor green means only blue
- Draw = 1 ball

$$\bullet \text{ Probability} = \frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{1 \text{ blue out of total } 7}{21C_1} = \frac{7C_1}{21C_1} = \frac{7}{21} = \frac{1}{3}$$

Ans: A



Probability

Q. What is the probability of getting a sum 5 from two throws of a dice?

- A. $1/9$ B. $1/8$ C. $1/7$ D. $1/6$

Soln-

Dice = 6 faces = 6 possibilities

So in two throws of dice, total possibilities = $6 \times 6 = 36$

Sum = 5, so favourable outcomes are - $\{ (1,4), (4,1), (2,3), (3,2) \}$

$$\text{Probability} = \frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{4}{36} = \frac{1}{9}$$

Ans : A



Probability

Q. Three unbiased coins are tossed. What is the probability of getting utmost two heads?

- A. $\frac{3}{4}$ B. $\frac{1}{4}$ C. $\frac{3}{8}$ D. $\frac{7}{8}$

• **Soln-**

- Total possibilities = {TTT, TTH, THT, HTT, THH, HTH, HHT, HHH}
- Event of getting utmost 2 heads = max 2H or 1H or 0H
- Possibility of getting 2 H = {TTH, THT, HTT, THH, HTH, HHT}
- Probability = $\frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{7}{8}$

Ans: D



Probability

Q. In a class, there are 15 boys and 10 girls. Three students are selected at random. The probability that 1 girl and 2 boys are selected, is:

A. $21/46$

B. $25/117$

C. $1/50$

D. $3/25$

Soln:

- Total students = $15 + 10 = 25$ students in a class
- Draw = 3 students

$$\text{Probability} = \frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{10C_1 \times 15C_2}{25C_3} = \frac{21}{46}$$

Ans : A



Probability

- A Standard deck of playing cards consist of 52 cards, among them there are 4 subgroups/suits –
- The four suits with there names , symbols and color –

1. The suit of Hearts



13 cards

2. The suit of Diamonds



13 cards

3. The suit of Clubs



13 cards

4. The suit of Spades



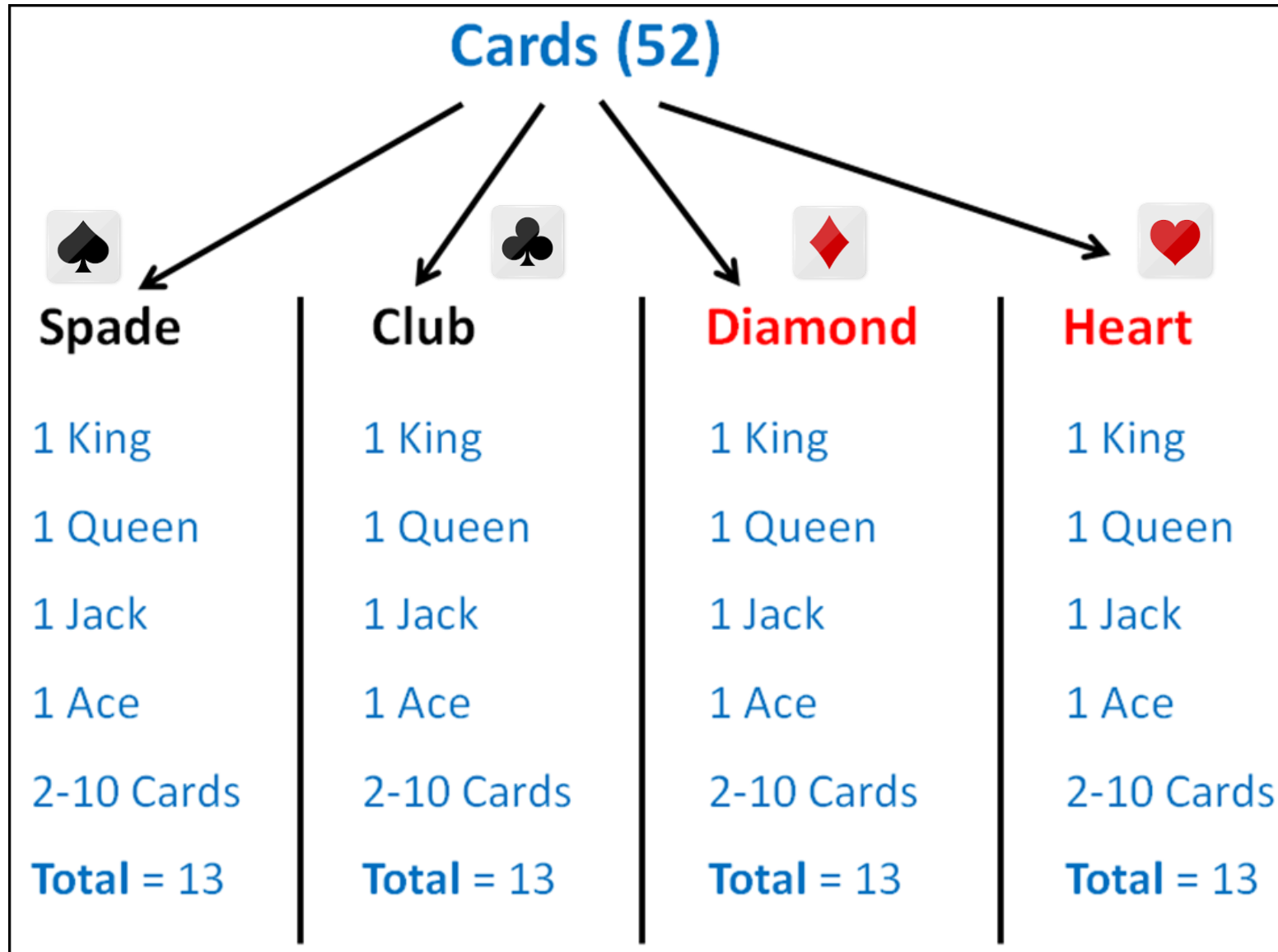
13 cards

26 red cards

26 black cards

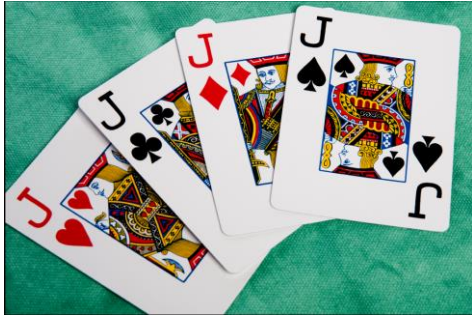


Probability

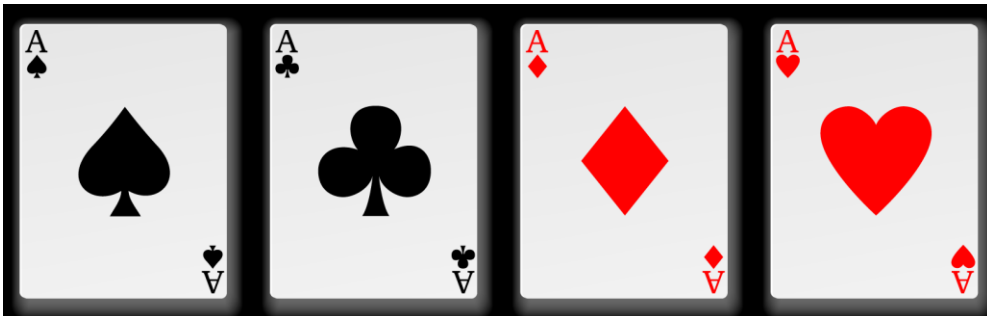


Probability

- King, Queen and Jack (or Knaves) are **face cards**. So, there are **12 face cards** in the deck of 52 playing cards.
- **Jokers** are not normally considered to be **face cards**



- **Aces**
- There are 4 Aces in every deck, 1 of every suit.



Probability

Q. From a pack of 52 cards, two cards are drawn together at random. What is the probability of both the cards being kings?

A. 1/15

B. 25/57

C. 35/256

D. 1/221

• **Soln-**

• **Total cards in a pack =52**

• **Total kings in a pack = 4**

• **Drawn =2**

• **Probability = $\frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{4C_2}{52C_2} = \frac{1}{221}$**

Ans : D



Probability

A man tossed two dice. What is the probability that the total score is a prime number?

A. $5/12$

B. $5/14$

C. $5/20$

D. $5/24$

• **Soln-**

• **Dice = 6 faces = 6 possibilities**

• 2 Dice = $6 \times 6 = 36$ possibilities

• Sum = prime number

• So favourable outcomes are - $\{ (1,1), (1,2), (1,4), (1,6), (2,1), (2,3), (2,5), (3,2), (3,4), (4,1), (4,3), (5,2), (5,6), (6,5), (6,1) \}$

• Probability = $\frac{\text{Favourable outcome}}{\text{Total number of outcomes}} = \frac{15}{36} = \frac{5}{12}$

Ans : A



Probability

Q. A brother and sister appear for an interview against two vacant posts in an office. The probability of the brother's selection is $\frac{1}{5}$ and that of the sister's selection is $\frac{1}{3}$. What is the probability that one of them is selected?

A. $\frac{1}{5}$

B. $\frac{2}{5}$

C. $\frac{1}{3}$

D) $\frac{2}{3}$

Soln: -

(brother is selected and sister is not selected) OR (brother is not selected and sister is selected)

$$\text{Probability} = \frac{1}{5} \times \frac{2}{3} + \frac{4}{5} \times \frac{1}{3}$$

$$= \frac{6}{15}$$

$$= \frac{2}{5}$$

Ans: B



Probability

Q. Probability of occurrence of event a is 0.5 and that of event b is 0.2. the probability of occurrence of both a and b is 0.1. what is the probability that none of a and b occur?

A. 0.4 B. 0.5 C. 0.2 D. 0.1

Soln:

probability of sure event = 1

probability of occurrence of event a = 0.5

Probability of occurrence of event b = 0.2

probability of occurrence of both a and b = 0.1

probability of none = $1 - 0.8 = 0.2$

Ans: C



Probability(Assignment)

Q. A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag. The probability that all of them are red, is?

A. $1/22$

B. $3/22$

C. $2/91$

D. $2/77$

Ans : C



Probability(Assignment)

Q. What is the probability of getting a sum 9 from two throws of a dice?

- A. $1/6$ B. $1/8$ C. $1/9$ D. $1/12$

Ans : C



Probability(Assignment)

Q. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

- A. $\frac{3}{4}$ B. $\frac{4}{7}$ C. $\frac{1}{8}$ D. $\frac{3}{7}$

Ans : B



Probability(Assignment)

Q. A bag contains 6 blue balls, 3 white balls and 4 green balls. If two balls are drawn at random what is the possibility that they are not of the same color?

A. $6/13$

B. $7/13$

C. $9/13$

D. $10/13$

• **Ans: C**



Probability(Assignment)

Q. One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a face card (Jack, Queen and King only)?

A. $1/13$

B. $1/4$

C. $3/13$

D. $9/52$

Ans: C



Probability(Assignment)

Q. One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is not a face card (Jack, Queen and King only)?

A. $5/13$

B. $10/13$

C. $1/13$

D. $1/26$

Ans: B



Interest

If P = Principal, R = Rate of interest, N = Time in years, I = Interest, A = Amount

Then **$A = P + I$**

Simple Interest

$$\text{S.I.} = (P \times R \times N) / 100$$

Basic principal remains constant.

S.I. is good example of AP(Arithmetic Progression)

Compound Interest

$$A = P (1 + R/100)^T$$

T = periods of compounding,

$$\text{C.I.} = A - P$$

R = rate for compounding period

Basic principal keeps on increasing as we get interest on interest.

C.I. is good example of GP(Geometric Progression)



Interest

Q. What is the difference between the simple interest on a principal of Rs. 500 being calculated at 5% per annum for 3 years and 4% per annum for 4 years?

A.Rs. 5 B.Rs. 10 C.Rs. 20 D.Rs. 40 E. None of these

$$\begin{aligned} SI_1 &= P N_1 R_1 / 100 \\ &= \frac{500 \times 3 \times 5}{100} = \text{Rs. } 75 \end{aligned}$$

$$\begin{aligned} SI_2 &= P N_2 R_2 / 100 \\ &= \frac{500 \times 4 \times 4}{100} = \text{Rs. } 80 \end{aligned}$$

$$\text{Difference} = 80 - 75 = \text{Rs. } 5$$

OR

$$\begin{aligned} 500 &\Rightarrow 15\% \uparrow \Rightarrow 575 \text{ (1st case)} \\ 500 &\Rightarrow 16\% \uparrow \Rightarrow 580 \text{ (2nd case)} \\ \text{difference} &= 580 - 575 = \text{Rs. } 5 \end{aligned}$$

Ans : A



Interest

Q. A man borrowed total Rs 2500 at Simple interest from two money lenders. He paid interest at 12% p.a. to one and 14% p.a. to the other. The total interest paid for the year was Rs.326. How much did he borrow at 14%?

A. Rs 1000

B. Rs 1200

C. Rs 1300

D. Rs 1500

Soln:

Let, x = Principal at 12%

&

$2500 - x$ = Principal at 14%

$$\text{SI at Rs. } x = \frac{x \times 1 \times 12}{100} = \frac{12x}{100} = \frac{3x}{25}$$

$$\text{SI at Rs. } 2500 - x = \frac{2500 - x \times 1 \times 14}{100} = \frac{(2500 - x) \times 7}{50} = \frac{17500x - 7x}{50}$$

$$\text{SI at } x + \text{SI at } 2500 - x = 326$$

Substitute and solving the equation gives $x = \text{Rs. } 1200$

We need Principal at $2500 - x = 2500 - 1200 = \text{Rs. } 1300$

Ans: C



Interest

Q. A sum of money placed at simple interest doubles itself in 8 years. Find the rate of interest

A. 8% p.a.

B. 10% p.a.

C. 15% p.a.

D. 12.5% p.a.

Soln:

Amount = Principal + Simple interest

Amount = 2P

$A = P + I$

$I = A - P$

$I = 2P - P = P, N = 8 \text{ yrs}$

$I = (P \times R \times N) / 100$

$P = (P \times R \times 8) / 100$

$R = 100 / 8 = 12.5\%$

Ans: D



Interest

Q. P =Rs. 2000, R =10%, N =2yrs , Find A and CI

Soln:

$$\begin{aligned}A &= 2000\left(1 + \frac{10}{100}\right)^2 \\&= 2000\left(\frac{110}{100}\right)^2 \\&= 2000\left(\frac{121}{100}\right) \\&= \text{Rs. } 2420\end{aligned}$$

$$\text{CI} = 2420 - 2000 = \text{Rs. } 420$$

$$2000 \rightarrow 10\% = 200$$

$$10\% \quad 10\%$$

$$2000 \longrightarrow 2200 \longrightarrow 2420$$

$$\text{CI} = 2420 - 2000 = 420$$



Interest

Q. P =Rs. 4000, R =20% per annum, N =6months.Find CI computed quarterly for given period.

Soln:

N =6months(2 quarterly)

rate(R) = 20 % per annum = 5 % quarterly

After every 3 months CI will be calculated.

	by <u>5%=200</u>		by <u>5%=210</u>	
4000		4200		4410

$$\begin{aligned} I &= 4410 - 4000 \\ &= \text{Rs. } 410 \end{aligned}$$



Interest

Q. A sum of money placed at compound interest doubles in 7 years. In how many years the principal becomes-

- a. 4 times of itself
- b. 8 times of itself

Soln:

Let initial value be 100



- a. In 14yrs
- b. In 21 yrs

OR

100----->200 in 7 years
200----->400 in again 7 years then,
400----->800 in 7 years again, thus
the time becomes= 7+7+7= 21 years.



Interest

Q. Difference between Compound interest & simple interest on a sum placed at 8% p.a. compounded annually for 2 years is Rs 128. Find the Principal

- A. 20000
- B. 24000
- C. 26000
- D. 15000

- **Soln:**

- Let the principal be $P = \text{Rs. } 100$.
- time $N = 2$ years, rate of interest $R = 8\%$ per annum
- simple interest = $\frac{PNR}{100} = \frac{100 \times 8 \times 2}{100} = \text{Rs. } 16$

- CI (for 2 years)

- 8% 8%
- $100 \xrightarrow{\quad} 108 \xrightarrow{\quad} 116.64$

- | | | |
|-----|-------|-------|
| | 16.64 | |
| P | SI | CI |
| 100 | 16 | 16.64 |
| | | Diff |
| | | 0.64 |

- $0.64 \rightarrow 100$

- $128 \rightarrow ?$

- $\frac{12800}{0.64} = \text{Rs. } 20000$



Interest

Q. Difference between Compound interest & simple interest on a sum placed at 8% p.a. compounded annually for 2 years is Rs 128. Find the principal

- A. 20000 B. 24000 C. 26000 D. 15000

• **Soln:**

- Let the principal be $P = \text{Rs. } 100$.
- time $N = 2$ years, rate of interest $R = 8\%$ per annum
- simple interest = $\frac{PNR}{100} = \frac{100 \times 8 \times 2}{100} = \text{Rs. } 16$
- compound amount = $P(1 + \frac{R}{100})^N$
- $= 100 \times (1 + \frac{8}{100})^2 = 100 \times (\frac{108}{100})^2 = 100 \times (\frac{11664}{10000}) = \frac{11664}{100} = 116.64$
- compound interest = compound amount – principal
- $C.I = A - P$
 $= 116.64 - 100 = \text{Rs. } 16.64$
- the difference between the compound interest and simple interest = $16.64 - 16.00 = \text{Rs. } 0.64$
- $0.64 \rightarrow 100$
- $128 \rightarrow ?$
- $= \frac{128 \times 100}{0.64} = 20000$
- Thus, the principal is Rs. 20000.

Interest

- If the difference between compound and simple interest is of **two years** than,
Difference = $P(R)^2/(100)^2$
Where P = principal amount, R = rate of interest
- If the difference between compound and simple interest is of **three years** than,
Difference = $3 \times P(R)^2/(100)^2 + P (R/100)^3$.
Here also, P = principal amount, R = rate of interest



Interest

Q.A started business with Rs. 45,000 and B joined afterwards with 30,000. If the profit at the end of a year was divided in the ratio 2 : 1 respectively, then B would have joined A for business after.

A. 1 month

B. 2 months

C. 3 months

D. 4 months

Soln:

- Capital of A = Rs. 45,000

Capital of B = Rs. 30,000

- Ratio of P1:P2=2:1

- using formula,

- $\frac{C_1T_1}{C_2T_2} = \frac{P_1}{P_2}$

- In this type , the time period is 12 months i.e. one year

- $\frac{45000 \times 12}{30000 \times T_2} = \frac{2}{1}$

- $T_2=9$

- B would join business after $(12 - 9) = 3$ months

- **Ans: C**



Interest(Assignment)

Q. When annual compounding is done, a sum amounts to Rs 5000 in 6 years and 7200 in 8 years.
What is the int rate?

- A. 10% B. 15% C. 20% D. 25%

Soln

Let P be the principal & R the int rate

$$\rightarrow 5000 = P(1+R/100)^6 \dots\dots(1)$$

$$\rightarrow 7200 = P(1+R/100)^8 \dots\dots(2)$$

$$\rightarrow 36/25 = (1+R/100)^2$$

\rightarrow Taking square roots of both sides

$$\rightarrow 1+R/100 = 6/5$$

$$\rightarrow R/100 = 1/5$$

$$\rightarrow R = 20\%$$

Ans: C



Interest(Assignment)

Q. A sum fetched a total simple interest of Rs.7056 at the rate of 8 percent per year in 7 years. What is the sum?

A. Rs 12600

B) Rs 15120

C) Rs 10080

D) Rs 7560

Ans : A



Interest(Assignment)

Q. A sum of money placed at compound interest doubles itself in 4 years. In how many years will it amount to 8 times?

- A. 9 years B. 8 years C. 27 years D. 12 years

Ans: D



Interest(Assignment)

Q. Difference between Compound interest & simple interest on a sum placed at 20% per annum compounded annually for 2 years is Rs. 72. Find the sum.

A. Rs. 2400

B. Rs. 8400

C. Rs. 1800

D. Rs. 900

Ans : C



Interest(Assignment)

Q. What is the simple interest on a sum of Rs. 700 if the rate of interest for the first 3 years is 8% per annum and for the last 2 years is 7.5% per annum?

A.Rs. 269.5 B.Rs. 283 C.Rs. 273 D.Rs. 280 E. None of these

Ans: C



Interest(Assignment)

Q. Rs.2100 is lent at compound interest of 5% per annum for 2 years. Find the amount after two years.

- A.Rs. 2300 B.Rs. 2315.25 C.Rs. 2310 D.Rs. 2320 E. None of these

• **Soln:**

- $A = P (1 + R/100)^T$

- $A = 2100(1+5/100)^2$

- $A=2100 \times [105/100]^2$

- $A = \frac{2100 \times 11025}{10000}$

- Amount, A=Rs.2315.25

- **Ans : B**



Interest(Assignment)

Q.A certain sum of money amounts to Rs. 704 in two years and Rs 800 in 5 years. Find the Principal.

- A. Rs. 640 B. Rs. 600 C. Rs. 550 D. Rs.450

• **Ans: A**



Interest(Assignment)

Q. A started a business by investing Rs. 32000. After 2 months B joined him with some investments. At the end of the year the total profit was divided in the ratio 8:5. How much capital was invested by B?

A. Rs. 30,000 B. Rs. 28000 C. Rs. 24000 D. Rs. 19000

- Soln:
- using formula,
- $\frac{C_1 T_1}{C_2 T_2} = \frac{P_1}{P_2}$
- $\frac{32000 \times 12}{C_2 \times 10} = \frac{8}{5}$
- $C_2 = \text{Rs. } 24000$

Ans: C



Interest(Assignment)

Q. A started a business by investing Rs. 32000. After 4 months B joined him with some investments. At the end of the year the total profit was divided in the ratio 6:5. How much capital was invested by B?

A. Rs. 30,000

B. Rs. 28000

C. Rs. 40000

D. Rs. 19000

Ans: C



