STAFF SELECTION COMMISSION – Solved Papers

PERCENTAGE (Some Important Exercises)

1. A person makes a profit of Rs. 60000 in his business. 40% of the profit he reinvests in his business for its diversification. Of the remaining profit he distributes 30% as bonus to his employees, 20% he denotes in charity and rest on advertisement. Find the amount spent on advertisement.

(1) Rs. 18000 (2) Rs. 12000

(3) Rs. 16000 (4) Rs. 20000

Ans : 1

Total profit = Rs. 60000

Amount reinvested in business

= 40% of Rs. 60000

= Rs. 24000

Remaining amount of the profit

= 60% of Rs. 60000

= Rs. 36000

Bonus to employees

= 30% of Rs. 36000

= Rs. 10800

Donation for charity

= 20% on Rs. 36000

= Rs. 7200

Amount spent on advertisement

= Rs. (36000 – 10800 – 7200)

= Rs. 18000

2. If 60% of students in a school are boys and the total number of girls in the school is 460, find the number of boys in the school.

(1) 680 (2) 690

(3) 700 (4) 720

Ans : 2

Let the total number of students be x.

Given, Number of boys

$= \frac{60}{100}x$ ……(i)

Number of girls = 460

$\Rightarrow$ Number of boys = $x - 460$

……(ii)

From equations (i) and (ii),

$\Rightarrow x - 460 = \frac{60x}{100}$

$\Rightarrow 460 = \frac{40}{100}x$

$\Rightarrow x = \frac{460 \times 100}{40} = 1150$

$\therefore$ Number of boys

= 1150 – 460 = 690

3. Find the total output of coalmine, if after 24% wastage the net output is 68,400 tonnes.

(1) 95000 tonnes

(2) 85000 tonnes

(3) 90000 tonnes

(4) None of these

Ans : 3

Let the total output be x tones.

Then, net output = $x-$

$\frac{24}{100} \times x = \frac{76x}{100}$

$\Rightarrow \frac{76}{100}x = 68,400$

$\Rightarrow x =$

$\frac{68,400 \times 100}{76} = 90,000$ tones

4. If A's salary is 50% more than B's then by what per cent B's salary is less than A's salary?

(1) 50% (2) 25%

(3) 23% (4) 33.3%

Ans : 4

Let the salary B = Rs. 100

Then, salary of A = 100 +

$\frac{50}{100} \times 100 =$ Rs.150

$\therefore$ B's salary is Rs. 50 less than A's salary.

$\therefore$ Percentage of B's income

less than A $= \frac{50}{100} \times 100$

$= \frac{100}{3} = 33\frac{1}{3}\%$.

Hence, B's salary is less than A's salary by 33.3%.

5. Quicklime contains 28.6% of oxygen by weight. Determine the weight of oxygen in 750 gm quicklime.

(1) 214.5 gm (2) 224.5 gm

(3) 234.5 gm (4) 235.5 gm

Ans : 1

100 gm quicklime contains oxygen = 28.6 gm.

$\therefore$ 1 gm quicklime contains

oxygen $= \frac{28.6}{100} \times 750$

= 214.5 gm.

Hence, weight of oxygen in 750 gm quicklime is 214.5 gm.

6. Price of commodity has increased by 60%. By what per cent must a consumer reduce the consumption of the

commodity so as not to increase the expenditure?

(1) 38.5% (2) 37.5%

(3) 38.5% (4) 25%

Ans : 2

Let the price of commodity be Rs. x per kg.

Increase in price = 60%

$\therefore$ Increased price of 1kg

= Rs. $1.6x$

If Rs. $1.6x$ is price of 1 kg

x is price of $\frac{x}{(1.6)x} = \frac{10}{16}$kg

$\therefore$ In order to keep the expenditure same, consumption should be reduced by

$1 - \frac{10}{16} = \frac{16-10}{16} = \frac{6}{16}$kg

Percentage reduction in consumption

$= \frac{6}{16} \times 100 = \frac{75}{2} = 37.5\%$

7. Sohan saves 14% of his salary while George saves 22%. If both get the same salary and George saves Rs. 1540, find the savings of Sohan.

(1) Rs. 950 (2) Rs. 960

(3) Rs. 980 (4) Rs. 990

Ans : 3

Let the total salary of each of them = Rs. x.

Sohan saves = Rs. $\frac{14}{100}x$

and George saves =

Rs. $\frac{22}{100}x = 1540$

$\Rightarrow x$ = Rs. 7000

$\therefore$ Sohan saves $= \frac{14}{100} \times 7000$

= Rs. 980

Savings of Sohan = Rs. 980.

8. In a quarterly examination, a student secured 30% marks and failed by 12 marks. In the same examination, another student secured 40% marks and got 28 marks more than bare minimum marks to pass. Find the pass percentage.

(1) 24% (2) 28%

(3) 25% (4) 33%

Ans : 4

Let the maximum marks to be x.

A student scored $= \frac{30}{100}x$, and failed by 12 marks.

$\therefore$ Passing marks $= \frac{30}{100}x + 12$

Another student scored = $\frac{40}{100}x$ and got 28 marks more than passing marks.

$\therefore$ Passing marks $= \frac{40}{100}x - 28$

$\Rightarrow \frac{10}{100}x = 40 \Rightarrow x = 400$

$\therefore$ Maximum marks = 400

Hence, Passing marks

$= \frac{30}{100} \times 400 + 12 = 132$

$\therefore$ Pass Percentage

$= \frac{132}{400} \times 100 = 33\%$

The pass percentage = 33%

9. In an election between two candidates A and B, A got 65% of the total votes cast and won the election by 2748 votes. Find the total number of votes cast if no vote is declared invalid.

(1) 9160 (2) 9260

(3) 9060 (4) 9360

Ans : 1

Let the total number of votes cast = x.

Number of votes got by

$A = \frac{65}{100}x$ ……(i)

$\Rightarrow$ B got =

$x - \frac{65}{100}x = \frac{100x - 65x}{100} = \frac{35}{100}x$

A won the election by 2748 votes.

$\therefore$ Number of votes for A =

$\frac{35}{100}x + 2748$ ……..(ii)

Form equations (i) and (ii),

$\frac{65}{100}x + \frac{35}{100}x + 2748$

$\Rightarrow \frac{30x}{100} = 2748$

$\Rightarrow x = \frac{2748 \times 100}{30} = 9160$

$\therefore$ Total number of votes cast

= 9160

10. In an examination, 40% marks are required to pass. A obtains 10% less than the number of marks required to pass. B obtains $11\frac{1}{9}\%$ less than A, and C, $41\frac{3}{17}$ percent less than the number of marks obtained by A and B together. Marks obtained by C is

(1) 42 (2) 40

(3) 38 (4) 36

Ans : 2

Suppose the maximum marks = 100

$\therefore$ Marks required to pass = 40

$\because$ A gets 10% less than pass marks.

$\therefore$ Marks secured by

$$A = \frac{40\times 90}{100} = 36$$

$\because$ B gets $11\frac{1}{9}\%$ marks less than A.

$\therefore$ Marks secured by B

$$= \frac{36\times\left(100-11\frac{1}{9}\right)}{100}$$

$$= \frac{36\times\left(\frac{900-100}{9}\right)}{100}$$

$$= 36\times\frac{800}{9}\times\frac{1}{100} = 32$$

Total marks obtained by A and B = 36 + 32 = 68

$\because$ C gets $41\frac{3}{17}\%$ marks less than the marks obtained by A and B together

$\therefore$ C's marks

$$= \frac{68\times\left(100-41\frac{3}{17}\right)}{100}$$

$$= \frac{68\times\left(100-\frac{700}{17}\right)}{100}$$

$$= \frac{68\times\frac{1000}{17}}{100}$$

$$= 68\times\frac{1000}{17}\times\frac{1}{100} = 40$$

11. A reduction of 25% in the price of apples would enable a purchaser to get 2 kg apples more for Rs. 240. Find the original price per kg of apples.

(1) Rs. 35 (2) Rs. 30

(3) Rs. 40

(4) None of these

Ans : 3

Let the original price be Rs. x per kg.

Reduction in price = Rs. $\frac{25}{100}x$

$\therefore$ Reduced price = $x-\frac{25}{100}x$

= Rs. $\frac{75}{100}x$ ……(i)

With Rs. 240, purchaser can purchase 2 kg more apples. Now, 25% of 240

$= \frac{25}{100}\times 240 = \text{Rs. } 60$

$\Rightarrow$ Reduced price of 2 kg of apples = Rs. 60

$\therefore$ Reduced price of 1 kg of apples = Rs. 30 …….(ii)

From equations (i) and (ii),

$$\frac{75}{100}\times x = 30$$

$$\Rightarrow x = \frac{30\times 100}{75} = \text{Rs. } 40$$

The original price of 1kg apples = Rs. 40.

12. 10% of the soldiers of an army are killed in the battle. 10% of the remaining soldiers died of disease and 10% of the remaining men were disabled. Now only 729000 soldiers are left in the army. How many soldiers were there in all in the army in the beginning?

(1) 990000 (2) 9900000

(3) 9800000 (4) 1000000

Ans : 4

Let the total number of soldiers in all in the army in the beginning = 100.

$\therefore$ Number of soldiers killed in the battle

$= \frac{10}{100}\times 100 = 10$

$\therefore$ Remaining soldiers

= 100 – 10 = 90

Number of soldiers who died of disease $= \frac{10}{100}\times 90 = 9$

$\therefore$ Remaining soldiers

= 90 – 9 = 81

Number of disabled soldiers

$= \frac{10}{100}\times 81 = \frac{81}{10}$

$\therefore$ Remaining soldiers

$$= 81-\frac{81}{10} = \frac{810-81}{10} = \frac{729}{10}$$

$\therefore$ If $\frac{729}{10}$ soldiers are left, then total number of soldiers = 100

$\therefore$ If 1 soldier is left, then total number of soldiers

$$= \frac{100\times 10}{729}$$

$\because$ If 729000 soldiers are left, then total number of soldiers

$$= \frac{100\times 10\times 729000}{729} = 1000000$$

13. In an examination, 42% students failed in Hindi and 52% failed in English. If 17% students failed in both the subjects, find the percentage of those students who passed in both the subjects.

(1) 23% (2) 22%

(3) 25% (4) 30%

Ans : 1

Let the number of students appeared be 100.

Number of students who failed in Hindi only

= (42 – 17) = 25

Number of students who failed in English only

= (52 – 17) = 35.

Number of students who failed in at least one of the subjects = (25 + 35 + 17) = 77.

Number of students who passed in both the subjects.

= (100 – 77) = 23%.

14. From the salary of an officer 10% is deducted as house rent; 15% of the rest he spends on children's education; 10% of the balance he spends on clothes. After this expenditure, he is left with Rs. 2754. Find his salary.

(1) Rs. 4500

(2) Rs. 4000

(3) Rs. 4200

(4) None of these

Ans : 2

Let the salary be Rs. 100. Then,

House rent = Rs. 10; Balance

= Rs. (100 – 10) = Rs.90.

Expenditure on children's education = 15% of Rs. 90

$= \text{Rs.}\frac{15\times 90}{100} = \text{Rs.}\frac{27}{2}$

Balance now = Rs.

$\left(90-\frac{27}{2}\right) = \text{Rs.}\left(\frac{180-27}{2}\right) = \text{Rs.}\frac{153}{2}$

Expenditure on clothes

$= \left(10\%\text{ of Rs.}\frac{153}{2}\right) = \text{Rs.}\left(\frac{153}{20}\right)$

Now, balance

$= \text{Rs.}\left(\frac{153}{2}-\frac{153}{20}\right) = \text{Rs.}\frac{1377}{20}$

If last balance is Rs. $\frac{1377}{20}$

then salary = Rs. 100.

If last balance is Rs. 2754, then salary

$= \text{Rs.}\left(\frac{100\times 20}{1377}\times 2754\right)$

= Rs. 4000.

15. The tax on an article decreases by 10% and its consumption increases by 10%. Find the effect per cent on its revenue.

(1) 1% increase

(2) 2% decrease

(3) 1% decrease

(4) 2% increase

Ans : 3

Let the original consumption be 1 unit & tax on it be Rs. 100. So, revenue

= Rs. (100 × 1) = Rs. 100.

New consumption

$\left(\frac{110}{100}\times 1\right) = \frac{11}{10}\text{units}$

Now, tax on 1 unit = Rs. 90

Tax on $\frac{11}{10}$units

$= \text{Rs.}\left(90\times\frac{11}{10}\right) = \text{Rs.}99$

∴ Decrease in revenue = 1%.

16. In a direct election between two contestants for the post of secretary, 4% of the total votes cast are declared to be illegal. One contestant secures 55% of the valid votes and wins with a majority of 240 votes, find the total number of votes cast.

(1) 3500 (2) 2400

(3) 2200 (4) 2500

Ans : 4

Suppose total number of votes cast = x.

∴ Number of illegal votes = 4%

of $x = \frac{4x}{100} = \frac{x}{25}$

∴ Number of valid votes

$= x - \frac{x}{25} = \frac{25x-x}{25} = \frac{24x}{25}$

Votes secured by the contestant who is defeated

$= \frac{24x}{25} - \frac{24x}{25}\times\frac{55}{100}$

$= \frac{24x}{25}\left(1-\frac{55}{100}\right) = \frac{24x}{25}\times\frac{45}{100}$

According to the question,

$\frac{24x}{25}\times\frac{55}{100} - 240 = \frac{24x}{25}\times\frac{45}{100}$

$\Rightarrow \frac{24x}{25}\left(\frac{55}{100}-\frac{45}{100}\right) = 240$

$\Rightarrow \frac{24x}{25}\cdot\frac{10}{100} = 240$

$\Rightarrow \frac{24x}{25} = 240$

$\Rightarrow x = \frac{250\times 240}{24} = 2500$

∴ Total number of votes cast

= 2500