RRB NTPC

Previous Years' Arithmetic Questions

Part V
Percentage

1. A number increased by $22\frac{1}{2}\%$ gives 98. The number is
A. 45
B. 18
C. 80
D. 81
Ans. C

Sol. $100\% + 22\frac{1}{2}\% = \frac{245}{200} = \frac{49}{40}$

According to the question, (49/40) of a number = 98

$\therefore$ the number $= \frac{40}{49} \times 98 = 80$

2. Two numbers are 40% and 80% lesser than a third number. By how much percent is the second number to be enhanced to make it equal to the first number?
A. 100
B. 33.3
C. 66.6
D. 200
Ans. D
Sol. Let the third number = 10
So, first number is 40% less means = 6
Second number is 80% less means= 2

Required % $= \frac{6-2}{2} \times 100 = 200\%$

3. In examination, there were 1000 boys and 800 girls. 60% of the boys and 50% of the girls passed. The percent of the candidates failed is
A. 46.4
B. 48.4
C. 44.4
D. 49.6
Ans. C
Sol. Number of boys who passed in the examination $= \frac{60}{100} \times 1000 = 600$

Number of girls who passed in the examination $= \frac{50}{100} \times 800 = 400$

Number of candidates who passed in the examination
= 600 + 400 = 1000

Total number of candidates = 1000+ 800 = 1800
Therefore, number of candidates who failed in the examination
= 1800 – 1000 = 800

Required percentage $= \left(\frac{800}{1800} \times 100\right)\% = 44.4\%$

Hence, option C is correct.

4. Half of 1percent, Written as a decimal, is
A. 0.2
B. 0.02
C. 0.005
D. 0.05
Ans. C
Sol. 1% = 1/100 = 0.01
Half of 1percent = ½ (0.01) = 0.005

5. If Ram got 30% marks and failed by 15 marks and Mohan got 40% and score 35 more than the pass marks. What is percentage necessary for passing?
A. 40%
B. 38%
C. 33%
D. 43%
Ans. C
Sol. Let the total maximum marks be x
Marks secured by Ram = 30x/100
Marks secured by Mohan = 40x/100
According to the question
$\frac{30x}{100} + 15 = \frac{40x}{100} - 35$
50 = 10x/100
x = 500
Passing marks = (30×500/100) + 15 = 165
Passing% = 165/500 × 100 = 33%
Hence Option C is correct

6. If 50%of (x − y) = 30% of (x+y), then what per cent of x is y?
A. 25
B. $33\frac{1}{3}$
C. 40
D. 400
Ans. A
Sol. 50%of (x − y)=30% of (x+y),
(x − y)/2 = 30(x+y)/100

5(x – y) = 3(x+y)

2x = 8y

x = 4y

y = x/4

Therefore y = (x/4)×100 %

→ y = 25% of x

7. Price of the sugar rises by 20%. By how much percent should the consumption of sugar be reduced so that the expenditure does not change?

A. 20

B. 10

C. $16\frac{2}{3}$

D. 15

Ans. C

Sol. **Short Trick:**

Let Initial Price of Suger = 100

Price after 20% increment = 120

To bring it back to 100 again, we have to reduce 20 out of 120

Required percentage = (20/120) *100

=100/6 %

= $16\frac{2}{3}$ %

Basic Method:

Let the consumption of sugar be x kg and its cost be 100.

Then New cost of x kg of sugar = 120

Now, `120 can fatch x kg of sugar

∴ `1 can fatch $\frac{x}{120}$ kg of sugar

∴ `100 can fatch $\frac{x}{120}\times100 = \frac{5x}{6}$ kg

Reduction in consumption = $x - \frac{5x}{6} = \frac{x}{6}$ kg

Reduction in %

= $\left(\frac{\frac{x}{6}}{x}\times100\right)\% = \frac{100}{6}\% = 16\frac{2}{3}\%$ AC

8. Ravi invested ₹ 913 partly in 4% stock at ₹ 97 and partly in 5% stock at ₹ 107. If his income from both is equal, amount invested on first stock was

A. ₹ 750

B. ₹ 525

C. ₹ 610

D. ₹ 485

Ans. D

Sol. Let he invests ₹ x in 4% stock and ₹ y in 5% stock

On ₹ 97 he earns Rs.4.On ₹ x he earns 4x/97

Similarly on ₹ y he will earns 5y/107

4x/97 = 5y/107

X = 485y/428

X + y = 913

Substituting the value of x we get y = 428

First installment = ₹ 485

9. If A's salary is 25% higher than B's salary. How much percent is B's salary lower than A's?

A. 15

B. 20

C. 25

D. $33\frac{1}{3}$

Ans. B

Sol. Required percentage $= \frac{25\times100}{125}$

$= \frac{2500}{125} = 20\%$

10. 5 kg of tea and 8 kg of sugar together cost ` 172. The price of tea has risen by 20% and that of sugar by 10%. Hence the same quantities of tea and sugar now cost ` 199.20. What is the original price of tea per kg?

A. Rs 18/kg

B. Rs 19/kg

C. Rs 20/kg

D. Rs 16/kg

Ans. C

Sol. Let the price of 1 kg of tea be Rs x and 1 kg of sugar be Rs y

Thus 5x + 8y = 172………………..(i)

New per kg price of tea = Rs 120x/100

New per kg price of sugar = Rs 110y/100

As per new prices

5(120x/100) + 8(110x/100)=199.20

Thus 6x + 44y/5 = 199.20…………………(ii)

From Equation (i)

x = (172 – 8y)/5…………..(iii)

Substituting the value of y in equation(ii) we get;

1032 – 4y = 996
y = 9
Substituting the value of y in (iii); we get
x = Rs 20 per kg
Hence Option C is correct

11. The population of a village is 3500, out of which 44% are men, 35% women and the rest are children. Find the number of children in the village.
A. 1120
B. 1540
C. 735
D. 1050
Ans. C
Sol. Total Population of man = 3500 × 44%
= 1540
Total Population of woman = 3500 × 35%
= 1225
Total Population of men and women =1540 +1225
= 2765
Population of children = 3500 – 2765
= 735
Alternate Approach:
Percentage of children in village = 100 - (44+35) = 21
Hence, number of children in village = (3500*21)/100 = 735

12. Mahavir pays 10% of his income as rent, 20% on the education of his children and 65% on his living expenses. If he deposits the remaining ₹ 40 in the post office, find his income
A. 400
B. 700
C. 800
D. 900
Ans. C
Sol. Total percentage of expenses
= 10 + 20 + 65 = 95%
Reaming amount = 100 – 95 = 5%
5% = ₹40
∴ 100% = $\frac{40}{5} \times 100$ = ₹800

13. Two numbers are respectively 20% and 40% more than a third number. What percent is the first number of the second?

A. $85\frac{5}{7}$

B. $75\frac{1}{7}$

C. 85

D. $85\frac{1}{7}$

Ans. A
Sol. **Short Trick:**
Let the third number be 100
Then, First Number = 120
Second Number = 140
Required Percentage = (120/140)*100
$= \frac{600}{7} = 85\frac{5}{7}\%$

Basic Method:
Let the third number =x
Then first number = 120% ofx
$= \frac{120x}{100} = \frac{6x}{5}$
and the second number = 140% ofx
$= \frac{140x}{100} = \frac{7x}{5}$

Required percentage $= \frac{\frac{6x}{5}}{\frac{7x}{5}} \times 100$

$= \frac{600}{7} = 85\frac{5}{7}\%$

14. The sum of 5% of a number and 4% of other number is $\frac{2}{3}$ of the sum of 6% of the first number and 8% of second. The ratio of the first number to the second is
A. 2 : 3
B. 3 : 2
C. 3 : 4
D. 4 : 3
Ans. D
Sol.

$5\%\ of\ x + 4\%\ of\ y = \dfrac{2}{3} \times (6\%\ of\ x + 8\%\ of\ y)$

$\dfrac{5x}{100} + \dfrac{4y}{100} = \dfrac{2}{3}\left(\dfrac{6x}{100} + \dfrac{8y}{100}\right)$

$\dfrac{5x + 4y}{100} = \dfrac{2}{3}\left(\dfrac{6x + 8y}{100}\right)$

$3 \times (5x + 4y) = 2 \times (6x + 8y)$

$15x + 12y = 12x + 16y$

$3x = 4y$

$\dfrac{x}{y} = \dfrac{4}{3}$

$x : y = 4 : 3$

Hence, option D is correct.

15. Tulsiram's salary is 20% more than that of kashyap. If Tulsiram saves ₹ 720 which is 4% of his salary, then Kashyap's salary is
A. ₹ 15000
B. ₹ 12000
C. ₹ 10000
D. ₹ 22000
Ans. A
Sol. Let Kashyap's salary be ₹x.

Therefore, Tulsiram's salary = ₹$\left(x + \dfrac{20}{100}x\right)$

= ₹$\dfrac{6x}{5}$

Tulsiram saves ₹720 which is 4% of his salary.
Therefore,

$4\% \times \dfrac{6x}{5} = 720 \quad \Rightarrow \quad \dfrac{4}{100} \times \dfrac{6x}{5} = 720$

$x = \dfrac{720 \times 100 \times 5}{24} = x = ₹15000$

Thus, Kashyap's salary is ₹15000.

16. A student multiplied a number by 11/13 instead of 13/11. What is the percentage error in the calculation?
A. 39.67 percent
B. 28.4 percent
C. 14.2 percent
D. 19.83 percent
Ans. B
Sol. Let the number be x
Incorrect number which student got after multiplying it by 11/13= 11/13 × x
Number should have been multiplied by 13/11 and come out to be 13/11x

Difference in the calculation=13/11 – 11/13
The percentage error in the calculation= ((13/11 – 11/13)/(13/11))× 100
⇒ (33.57/1.18) × 100
⇒ 28.40%
Hence the correct answer is option B

17. Two numbers are 40% and 50% lesser than a third number. By how much percent is the second number to be enhanced to make it equal to the first number?
A. 16.67 percent
B. 20 percent
C. 10 percent
D. 25 percent
Ans. B
Sol. Let the third number be 100 then the first number = 60 and second number = 50
Percentage that the second number should raise to make it equal to the first number = $\dfrac{60-50}{50} \times 100$

= 20%

18. A sum of Rs 6100 was divided among 8 men, 10 women and 12 children in such a way that each man received 25% more than a woman and each woman received 25% more than a child. How much did each woman receive?
A. Rs 203.68
B. Rs 206.08
C. Rs 206.68
D. Rs 201.68
Ans. B
Sol. Let the child received Rs. x
Women = x+25% of x = 5x/4
Men = 5x/4 + 25% of 5x/4 = 5x/4 + 5x/16 = 25x/16
Now, we need to multiply the indivisual Rs received by child, women, men to the total number of them respectively.
Total = 12x+25x/2+25x/2= 6100
37x=6100 → x=6100/37 = 164.86
For women share = 5x/4 = 206.08

19. When the price of sugar decreases by 10%, a man could buy 1 kg more for ₹

270. Then, the original price of sugar per kg is
A. ₹ 25
B. ₹ 30
C. ₹ 27
D. ₹ 32
Ans. B
Sol. Let the original price be x
Original quantity bought=270/x
New price=90% of x
New quantity=270/0.9x
Equating 270/0.9x – 270/x=1
X=30
Alternate Approach :
New Old
price 9 10
quantity 10 9
difference = 1 which means 1 kg
therefore 9 kg will be bought according to old price for rs .270
original rate = 270/9 = Rs. 30/kg

20. A student multiplying a number by 3/5 instead of 5/3, what is percentage error in the calculation?
A. 44%
B. 34%
C. 54%
D. 64%

Ans. D
Sol. Let the number be x
Then error=5x/3-3x/5=16x/15
Error%=16x/15 ÷ 5x/3 ×100=64%

21. Two numbers are respectively 10% and 25% more than a third number. What per cent is the first of the second number?
A. 88%
B. 65%
C. 75%
D. 80%
Ans. A
Sol. Let the third number be x.

Then, first number = $110\% \times x = \dfrac{110}{100} \times x = \dfrac{11x}{10}$

Second number = $125\% \times x = \dfrac{125}{100} \times x = \dfrac{5x}{4}$

Thus, the required percentage =

$$\left(\dfrac{\frac{11x}{10}}{\frac{5x}{4}} \times 100\right)\% = \left(\dfrac{11}{10} \times \dfrac{4}{5} \times 100\right)\% = 88\%$$

Hence, option A is correct.

22. If x is less than y by 25%, then y exceed x by

A. $33\dfrac{1}{3}\%$

B. 25%
C. 75%

D. $66\dfrac{2}{3}\%$

Ans. A
Sol. Let y be 100 then x=75
Required
percentage=(25/75)×100=33.33%

23. The price of sugar is reduced by 20%. Now, a person can buy 500 g more sugar for ₹ 36. The original price of the sugar per kilogram was
A. ₹ 14.40
B. ₹ 18
C. ₹ 15.60
D. ₹ 16.50
Ans. B
Sol.

Let the original price of sugar be Rs. x/kg.

$\therefore$ Reduced price of sugar $= x - \dfrac{20x}{100}$

$= $ Rs. $\dfrac{4x}{5}$

$\therefore \quad \dfrac{36}{\frac{4x}{5}} - \dfrac{36}{x} = 0\cdot5$

$\Rightarrow \quad \dfrac{45}{x} - \dfrac{36}{x} = 0\cdot5$

$\Rightarrow \quad \dfrac{9}{x} = 0\cdot5$

$\therefore \quad x = \dfrac{9}{0\cdot5}$

$= $ Rs. 18/ kg

Hence, option B is correct.

24. If the radius of a circle is increased by 21%, then its area will increase by what percent?
A. 42 percent
B. 21 percent
C. 23.205 percent
D. 46.41 percent
Ans. D
Sol. Let radius = 100 meter
Area = π 10^4
Increase in radius = 21%
So area after increase radius= π × 121 ×121=14641π
%increase = $\frac{14641\pi - 10000\pi}{10000\pi} \times 100 = \frac{4641\pi}{10000\pi} \times 100 = 46.41\%$

25. From 2008 to 2009, the sales of a book decreased by 80%. If the sales in 2010 were the same as in 2008, by what percent did it increase from 2009 to 2010?
A. 120%
B. 400%
C. 80%
D. 100%
Ans. B
Sol. Number of books sold in 2008 = 100
Number of books sold in 2009 = 20
Number of books sold in 2010 = 100

∵ Required percentage increase = $\frac{100 - 20}{20} \times 100$

$= 4 \times 100 = 400$

26. If A is equal to 20% of B and B is equal to 25% of C; then what percent of C is equal to A?
A. 10
B. 15
C. 5
D. 20
Ans. C
Sol. A is equal to 20% of B and B is equal to 25% of C.
Therefore,

$A = \frac{20}{100} B = \frac{B}{5}$

And, $B = \frac{25}{100} C = \frac{C}{4}$

Therefore,

$A = \frac{C}{4 \times 5} = \frac{C}{20}$

If $A = C$

then, $\left(\frac{1}{20} \times 100\right)\% = 5\%$

27. In the annual examination Mahuya got 10% less marks than Supriyo in Mathematics. Mahuya got 81 marks. The marks of Supriyo are
A. 90
B. 87
C. 88
D. 89
Ans. A
Sol. Marks obtained by Supriyo = x

$\therefore \frac{9x}{10} = 81$

$\Rightarrow x = \frac{81 \times 10}{9} = 90$

28. Income to expenditure ratio of Swati is 12:7. If income is increased by 8.33% and saving is increased by 40% then percentage effect on expenditure is:
A. 125%
B. 16.66%
C. 31.25&
D. 14.28%
Ans. D
Sol.
Let income of swati = 12x
Expenditure of swati = 7x
Saving = 12x -7x = 5x
As income is increased by 8.33%

$8.33\% = \frac{1}{12}$

So new income = $12x + 12x \times \frac{1}{12} = 13x$

Also saving is increased by 40 %

New saving = $5x + 5x \times \frac{40}{100} = 7x$

New expenditure = 13x – 7x = 6x
So, percentage effect on expenditure = $\frac{6-7}{7} \times 100 = -14 \cdot 28\%$

So, expenditure is decreased by 14.28%
Method: 2

A.T.Q,

Income : Expenditure : Savings
12 : 7 : 5

Now, Income increases by 8.33% = 8(1/3)% = 25/3% = 25/300 = 1/12

so,

Increased Income : Pervious Income
13 : 12

Also, Savings increased by 40% = 2/5

Increased Savings : Pervious Savings
7 : 5

So, New Expenditure = 13 -7 = 6

Percentage effect on Expenditure = (-1/7)×100 = -14.28%

29. A number is decreased by 12% and the resulting number is again decreased by 25%. What is the final percentage of decrease?
A. 26%
B. 37%
C. 34%
D. 24%
Ans. C

C. 400
D. 125
Ans. A
Sol. 125% of x is 100
Hence

$$125 \times \frac{x}{100} = 100$$

$$\Rightarrow x = 100 \times \frac{100}{125} = 80$$

32. If 20% of (A + B) = 50% of B, then value of $\frac{2A - B}{2A + B}$ is

A. 1/2
B. 1/3
C. 1/4
D. 1
Ans. A
Sol. 20% of (A + B) = 50% of B
$\Rightarrow$ 20(A + B)/100 = 50B/100
$\Rightarrow$ 20A + 20B = 50B
$\Rightarrow$ 20A = 30B
$\Rightarrow$ 2A = 3B

$$\frac{2A - B}{2A + B} = \frac{3B - B}{3B + B} = \frac{2B}{4B} = \frac{1}{2}$$

Sol.

$$Effective\ Percentage\ decrease = \left(x + y + \frac{xy}{100}\right)\%$$

$$= \left(-12 - 25 + \frac{(-12) \times (-25)}{100}\right)\% = (-37 + 3)\% = -34\%$$

Option C is correct.

30. A number, on subtracting 15 from it, reduces to its 80%. What is 40% of the number?
A. 75
B. 60
C. 30
D. 90
Ans. C
Sol. Acc to the question,
20% of x =15
x = 75
40% of 75 = 30

31. If 125% of x is 100, then x is :
A. 80
B. 150

33. If y% of 1 h is 1 min 12s , then y is equal to
A. 2
B. 1
C. $\frac{1}{2}$
D. $\frac{1}{4}$
Ans. A
Sol. Since 1 h = 60 min or 3600s and
1 min + 12 s = (60 + 12) s = 72 s
Then, y% of 3600 = 72

$$3600 \times \frac{y}{100} = 72$$

$$y = \frac{72 \times 100}{3600}$$

$$y = 2$$

34. B got 20% marks less than A. What percent marks did A got more than B?
A. 20%
B. 25%
C. 12%
D. 80%

Ans. B
Sol. Let the mark obtained by A be 100
Mark obtained by B
$100 - 20 = 80$

$Re\,quired\% = \dfrac{20}{80} \times 100 = 25\%$

35. A student scored 470 marks in 6 subjects. The maximum marks for each subject was 100. What was his score in percentage terms?
(A) 67.33%
(B) 69.45%
(C) 78.33%
(D) 78.67%
A. (A)
B. (B)
C. (D)
D. (C)
Ans. D
Sol.
maximum marks in 6 subjects = 100x6=600
total scored marks=470
percentage
score=470/600x100=78.33%