SSC Exam Questions

Sunday, March 12, 2023   4:00 PM

(T2 2021)

Q.1 The cost price of an article is ₹ 2800. Profit as a percentage of selling price is 20 percent. What is the actual profit (in ₹)?

Let SP = 100

Profit → 20% on SP = $\boxed{20}$, then CP = SP − profit
= 100 − 20 = 80

actual profit % → $\frac{20}{80} \times 100\% = 25\%$ (on CP)

Actual profit = 25% of 2800 = 700

(CGL T1 2021)

Q.1 A sold a mobile phone to B at a gain of 25% and B sold it to C at a loss of 10%. If C paid ₹5,625 for it, how much did A pay (in ₹) for the phone?

CP of A = 100   SP of A = 125 = CP of B   SP of B = $\frac{9}{10} \times 125$ = CP of C

$\frac{9}{10} \times 125 \longrightarrow 100$

$\left(1 - \frac{1}{10}\right) \times 125$

$1 \longrightarrow \frac{100 \times 10}{9 \times 125}$

$5625 \longrightarrow \frac{100 \times 10}{9 \times 125} \times \cancel{5625}\,5 = 5000$ ✓

(CGL T2 2022)

Q.2 The sum of the curved surface area and total surface area of a solid cylinder is 2068 cm². If radius of its base is 7 cm, then what is the volume of this cylinder? (use π=22/7)

$\pi r^2 h$

Curved surface area = $2\pi r h$

Total surface area = $2\pi r h + \pi r^2 \cdot 2$
= $2\pi r (r+h)$

$2\pi r h + 2\pi r (r+h) = 2068$

⇒ $2\pi r h (h + r + h) = 2068$ [as written: $2\pi r (h+r+h)$]

⇒ $2 \cdot \frac{22}{\cancel{7}} \times \cancel{7}(r + 2h) = 2068$

⇒ $(7 + 2h) = \frac{2068}{44}$

$7 + 2h = 47$
⇒ $h = 20$ cm

2−0+6−0 **Ans** ✗ 1. 2060 cm³
2−4+8−0 ✗ 2. 2480 cm³
3−0+8−0 ✔ 3. 3080 cm³
2−7+6−0 ✗ 4. 2760 cm³

$\frac{22}{7}$

$2\pi r (r + 2h)$

$2 \enspace \textcircled{\pi} \enspace r$

40/9

Q.3 If sinθ = (9/41), 0° < θ < 90° then what is the value of cotθ?

S (S)ome   (C)urly t through
P (P)eople b black p proper
h (h)ave   h hair   b brushing

41 / 9 , base ?40

$\sqrt{41^2 - 9^2}$
= $\sqrt{1681 - 81}$
= $\sqrt{1600}$
= 40

$(40+1)^2$
= 1600 + 80 + 1
= 1681

(CHSL 22)

Q.5 A can finish a piece of work in 16 days and B can finish it in 12 days. They worked together for 4 days and then A left. B finished the remaining work. For how many total number of days did B work to finish the work completely?

Efficient

TW = LCM(16, 12, 4) = 48 units

eA = 48/16 = 3
eB = 48/12 = 4

e(A+B) = 4(3+4)
= 28 units

remaining = (48−28)u
= 20 u

B will do remaining work in $\frac{20}{4}$ = 5 days

Total days = (4+5)d = 9 days

TW = 48
eA = 3
eB = 4   4e(A+B) = 28 $\frac{48-28}{4} = 5$

cuboidal

Q.6 A solid cube of side 8 cm is dropped into a rectangular container of length 16 cm, breadth 8 cm and height 15 cm which is partly filled with water. If the cube is completely submerged, then the rise of water level (in cm) is:
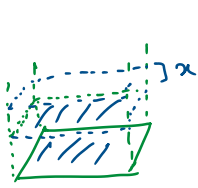
height $= x$, $\quad l = 16, b = 8$

volume of water displaced $= x \times 16 \times 8 \ cm^3 = 8^3 \ cm^3$

$\Rightarrow x \times 2 \times 8 \times 8 = 8^3$

$\Rightarrow x = 4 \ cm$

Q.7 If $(x + 6y) = 8$, and $xy = 2$, where x > 0, what is the value of $(x^3 + 216y^3)$?

$\begin{cases} x=1, y=2 \\ x=2, y=1 \end{cases}$

$2 + 6 \times 1 = 8 \qquad x=2, y=1 \qquad 8 + 216 = 224$
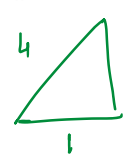
Q.10 If $4 sin^2\theta = 3(1 + cos\theta)$, $0° < \theta < 90°$, then what is the value of $(2 tan\theta + 4 sin\theta - sec\theta)$?

$4 s^2 = 3(1+c)$

$4(1 - c^2) = 3(1+c)$

$4(1-c) = 3$

$1 - c = \frac{3}{4}$

$c = \frac{1}{4} \checkmark$

$(1+c) \neq 0$

Why?

$\sqrt{4^2 - 1^2} = \sqrt{15}$

$\boxed{3\sqrt{15} - 4}$

$2 \cdot \frac{\sqrt{15}}{1} + 4 \cdot \frac{\sqrt{15}}{4} - 4$

$\Rightarrow 2\sqrt{15} + \sqrt{15} - 4$

Q.11 The lengths of the three sides of a right-angled triangle are (x − 1) cm, (x + 1) cm and (x + 3) cm, respectively. The hypotenuse of the right-angled triangle (in cm) is:

3, 4, 5   5, 12, 13   6 8 10 $\rightarrow x = 7$ 10 cm

Q.16 Find the greatest number 23a68b, which is divisible by 3 but NOT divisible by 9.

$2 + 3 + 6 + 8 + (a + b) \rightarrow 19 + a + b$. Put a = 9 $\rightarrow$ 28 + b   3n & not 9n

239685 $b = \cancel{2}, 5, \cancel{8} \rightarrow 36$

CP $\longrightarrow$ SP

profit

SP > CP $\longrightarrow \frac{P}{CP} \times 100\%$

loss   SP < CP $\longrightarrow \frac{L}{CP} \times 100\%$

MP $\xrightarrow{discount}$ SP

$\nearrow \rightarrow$ mark-up

CP

Tax

SP = ___ + tax

retail price = SP + tax

$d = SP - MP$

$d\% = \frac{d}{MP} \times 100\%$

Q.2 When A commodity is sold for Rs. 34.80, there is a loss of 25%. What is the cost price of the commodity?

(A) Rs. 46.40 ✓
(B) Rs. 26.10
(C) Rs. 43
(D) Rs. 43.20

SP = 34.8   loss $25\% = \frac{1}{4}$

CP = 100 , SP = 75

$SP = (100 - 25)\% \ of \ CP$

$\approx (1 - \frac{L}{100}) CP$

$= (1 - \frac{1}{4}) CP = \frac{3}{4} CP$

11. C

$34.8 = \frac{3}{4} CP$

$\Rightarrow CP = 46.4$

Q.3 If the S.P. of an article for is 4/3 times its C.P. the profit percent is.......

(A) 33 1/3% ✓
(B) 25 1/4 %
(C) 20 ½ %
(D) 20 ¾ %

$SP = \frac{4}{3} CP$

$P = \frac{4}{3} CP - CP = \frac{1}{3} CP$

$\frac{P}{CP} = \frac{1}{3} \Rightarrow 33\frac{1}{3}\%$

Profit, Loss and Discount

$1 \quad - \quad 100\%$

$1/2 \quad - \quad 50\%$

$1/3 \quad - \quad 33\frac{1}{3}\%$

$1/4 \quad - \quad 25\%$

$1/5 \quad - \quad 20\%$

$1/6 \quad - \quad 16\frac{2}{3}\%$

$1/7 \quad - \quad 14\frac{2}{7}\%$

$1/8 \quad - \quad 12\frac{1}{2}\%$

$1/9 \quad - \quad 11\frac{1}{9}\%$

$1/10 \quad - \quad 10\%$

$1/11 \quad - \quad 9\frac{1}{11}\%$

$1/5 = 20\%$

Q.4 By selling an article for Rs. 19.50, a dealer makes a profit of 30%. By how much should he increase his S.P. so as to make a profit of 40%?

— SP   — 1st   ~ 2nd

(A) Rs. 1.50 ✓

(B) Rs. 1.75

(C) Rs. 2

(D) Rs. 3

$1.3 CP = 19.5$

$CP = 15$

$Increase = (15 \times 1.4 - 19.5)$

$= (21 - 19.5) = 1.5$

Q.5 The C.P. of 20 articles is the same as S.P. of 15 articles. The profit percent is....

(A) 25%

(B) 30%

(C) 33 1/3 % ✓

(C) 50%

$20 CP = 15 SP$

$\Rightarrow \quad \dfrac{CP}{SP} = \dfrac{15}{20}$

$CP = 15$

$SP = 20$

$P\% = \dfrac{5}{15} \times 100\%$

Q.6 A fruit seller purchases oranges at the rate of 3 for Rs. 5 and sells them at 2 for Rs. 4. His profit is.......

(A) 10%

(B) 11%

(C) 20% ✓

(D) 25%

6 orange $CP = 10$

$SP = 12$

profit $= 20\%$

$CP = 5/3$

$SP = 2$

$\therefore \dfrac{2 - 5/3}{5/3}$

Q.8 A man buys eggs at 2 for Rs. 1 and an equal number at 3 for Rs. 2 and sells the whole at 5 for Rs. 3. His gain or loss percent is.......

(A) 2 2/7 %

(B) 3 6/7 %

(C) 3 2/7 %

(D) 2 6/7 % ✓

$30 \rightarrow 15$

$30 \rightarrow 20$

$60 \rightarrow 36$

$CP = 35$

$SP = 36$

$\% p = \dfrac{100}{35} \quad \dfrac{20}{7} \quad 2\frac{6}{7}\%$

Q.9 A sells a bicycle to B at a profit of 20% and B sells it to C at a profit of 25%. If C pays Rs. 1500, what did A pay for it?

(A) Rs. 825

(B) Rs. 1000 ✓

(C) Rs.1100

(D) Rs. 1125

cp A = 100 ✓

SP A = CP B = 120 ✓

SP B = CP C = $1.25 \times 120 = 150$ ✓

150 : 1500

100 : ___?

1000

Q.10 Two mixers and a TV costs Rs. 7000, while 2 TVs and a mixer cost Rs. 9800. The values of one TV is......

(A) Rs. 2800

(B) Rs. 2100

(C) Rs. 4200 ✓

(D) Rs. 8400

$4x + 2y = 14000$

$- \quad x + 2y = 9800$

$3x = 4200$

$\Rightarrow x = 1400 - M$

$1400 + 2y = 9800$

$\Rightarrow y = 4200$

Profit, Loss and Discount

A tradesman marks his goods at 35% above its cost price and allows a discount of 17.5% for purchase in cash. What profit per cent does he make ?

- (A) 11.25
- (B) 12.125
- (C) 11.125
- (D) 11.375 ✓

$CP = 100$

$MP = 135$

$SP = (100 - 17.5)\% \text{ of } MP$

$= \dfrac{82.5 \times 135}{100}$

$= 111.375$

$$
\begin{array}{r}
825 \\
135 \\
\hline
4125 \\
2475\times \\
825\times\times \\
\hline
111.375
\end{array}
$$

A trader sells his goods at 20% profit. Had he bought it at 10% more and sold it for Rs. 70 more, he would have earned a profit of 25%. Find the cost price of the goods.

- (A) Rs. 200
- (B) Rs. 800
- (C) Rs. 400 ✓
- (D) Rs. 600

$CP = x$

$SP = 1.2x$

$\Big\{ \begin{array}{l} CP = 1.1x \;\checkmark \\ SP = 1.2x + \boxed{70} \end{array}$

$0.1x + 70 = \dfrac{1.1x}{4}$

$\Rightarrow 70 = 0.175x$

$\Rightarrow 10 = 0.025x$

(break even)

A trader sold two bullocks for Rs. 8,400 each, neither losing nor gaining in total. If he sold one of the bullocks at a gain of 20%, then the other is sold at a loss of

- (A) 20%
- (B) $18\frac{2}{9}$ %
- (C) $14\frac{2}{7}$ % ✓
- (D) 21%

$SP = 8400$

$CP = 9800$

$\dfrac{1400}{9800} = \dfrac{1}{7}$

$8400 \rightarrow 16800 \checkmark$

$1.2 \times (B_1) = 8400$

$\Rightarrow \dfrac{12}{10} B_1 = 8400$

$\Rightarrow B_1 = 7000$

$CP = 16800 - 7000$

$= 9800$

After getting two successive discounts Shalini got a shirt at Rs. 136 whose marked price is Rs. 200. If the second discount is 15% find the first discount.

SP   MP

- (A) 12.5%
- (B) 15%
- (C) 25%
- (D) 20% ✓

$100 - x\% \text{ of } 200$

$= \dfrac{100 - x}{100} \times 200$

$= 2(100 - x)$

$\dfrac{85}{100} \times 2(100 - x) = 136^{8}$

$100 - x = 80$

$x = 20$

Profit, Loss and Discount

3. By selling 32 oranges for ₹ 30 a man losses 25%. How many oranges should be sold for ₹ 24, so as to gain 20% in the transaction?

(1) 16
(4) 40
(2) 24
(5) None of these
(3) 32

SP of 1 orange $= \dfrac{30}{32}$

$CP - SP = \dfrac{1}{4}CP$

$\Rightarrow \quad \dfrac{3}{4}CP = SP = \dfrac{30}{32}$

$\Rightarrow \quad CP = \dfrac{5}{4}$

$SP = \dfrac{5}{4} \times \dfrac{6}{5} = \dfrac{3}{2}$

$$\dfrac{3}{2} - 1$$
$$1 - \dfrac{2}{3}$$
$$24 -$$

$\dfrac{2}{3} \times 24 = 16$

4. The cost price of 24 apples is same as the selling price of 18 apples. The percentage of gain is

(1) $12\dfrac{1}{2}\%$
(2) $14\dfrac{2}{3}\%$
(3) $16\dfrac{2}{3}\%$
(4) $33\dfrac{1}{3}\%$
(5) None of these

$24\,CP = 18\,SP$

$\Rightarrow \quad \dfrac{SP}{CP} = \dfrac{4}{3}$

5. A merchant bought some goods worth ₹ 6000 and sold half of them at 12% profit. At what profit per cent should be sell the remaining goods to make and overall profit of 18%?

(1) 24
(4) 20
(2) 28
(5) 26
(3) 16

remaining = 720, on remaining $cp = 3000$
profit

Profit $= 18\%$ of 6000
$= 1080$

₹3000 @ 12% profit
Profit $= 360$

$\therefore$ % profit $= 24$

$\left[a + b - \dfrac{ab}{100} \right]\%$

6. The equivalent discount to consecutive discounts of 10% and 20% will be

(1) 32%
(4) 30%
(2) 28%
(5) None of these
(3) 36%

9. A shopkeeper sells his goods at 15% discount. The marked price of an article whose selling price is ₹ 629 is

(1) ₹ 740
(4) ₹ 614
(2) ₹ 704
(5) None of these
(3) ₹ 700

$5 \dfrac{85 \cdot MP}{100} = 629^{37}$

$\Rightarrow \quad MP = 740$

10. A dishonest dealer professes to sell his goods at cost price but he uses a weight of 800 g for a kg weight. Find his gain per cent.

(1) 35%
(4) 25%
(2) 56%
(5) None of these
(3) 23%

On selling 800g, he gains 200 g

$\therefore$ % profit $= \dfrac{200}{800} \times 100\%$

Formula $\quad$ Gain % $= \dfrac{\text{True weight} - \text{False weight}}{\text{False weight}} \times 100\%$

8 units $\quad$ 144 g — inventory, 100 per unit $\quad^{CP}$

$CP = 800$

$SP = 9$ units $\times 90$ per unit

$= 810$

profit $= 810 - 600 = 210$

11. A dishonest dealer sells articles at 10% loss on cost price but uses the weight of 16 g instead of 18 g. What is his profit to loss per cent?

(1) $1\dfrac{1}{4}\%$ gain
(2) $1\dfrac{1}{4}\%$ loss
(3) $3\dfrac{1}{4}\%$ loss
(4) $5\dfrac{1}{4}\%$ gain
(5) None of these

profit% $= \dfrac{10}{800} \times 100\%$

Profit, Loss and Discount

12. A dishonest dealer sells his goods at 10% loss on cost price and uses 30% less weight. What is his profit or loss per cent?

$\dfrac{7}{}$ $\dfrac{10}{}$

(1) $28\dfrac{4}{7}$ % loss

(2) $28\dfrac{3}{7}$ % gain

(3) $23\dfrac{3}{7}$ % loss

(4) $28\dfrac{4}{7}$ % gain ✓

(5) None of the above

Total inventory = 70

Bought = 7 units @ 100/unit

Sale = 10 units @ 90/unit

$cp = 7 \times 100 = 700$

$SP = 10 \times 90 = 900$

Profit % = $\dfrac{200}{7}$ % = $28\dfrac{4}{7}$ % gain

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1. Suhas sold an item for ₹ 7500 and incurred a loss of 25%. At what price, should he have sold the item to have gained a profit of 25%?

(1) ₹13800

(2) ₹ 12500 ✓

(3) ₹ 11200

(4) Can't be determined

(5) None of these

$CP = 10000$

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7. A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. The quantity sold at 18% profit is

(1) 500 kg

(2) 600 kg ✓

(3) 400 kg

(4) 640 kg

(5) None of these

profit

$0.08x + 0.18(1000-x) = 140$

$\Rightarrow \quad 180 - 140 = 0.1x$

SP

$1.08x + 1.18(1000-x) = 1140$

$\Rightarrow \quad 1180 - 0.1x = 1140$

$\Rightarrow \quad x = 400 \text{ kg}$

SSC Page 7

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SSC Page 9

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