Simple Interest and Compound Interest

Solution

1. Answer: (D)
Time = 4 years and Rate = 8% p.a.
Hence 1280 = p × 4 × 8/100.
Thus p = 128000/32 = ₹4000.
Now, for compound interest, r = 10% p.a compounded annually and n = 2 years
Amount after compound interest
$= p\times(1+(r/100))^n$
Hence amount = $4000(1+(10/100))^2$
$= 4000\times(1.1)^2 = 4000\times1.21 = ₹4840$.
Hence the amount is ₹4840.

2. Answer: (D)
Let the sum of money be ₹P, rate of interest be r% p.a.
Therefore,
$2P = P(1+r/100)^4$
Similarly
$4P = P(1+r/100)^4 \times (1+r/100)^4$
i.e. in 8 years it becomes 4 times
Similarly
12 yrs = 8 times
16 yrs= 16 times
20 yrs= 32 times

3. Answer: (D)
CI - SI = 169
$\{P(1 + R/100)^T - P\} - \{(P\times R\times T)/100\} = 169$
$\{P(1 + R/100)^2 - P\} - \{(P\times R\times 2)/100\} = 169$
$P\{1 + (R/100)^2 + 2R/100 - 1 - 2R/100\} = 169$
$P\times(R/100)^2 = 169$
$P\times(13/100)^2 = 169$
P = (169 × 100 × 100)/(13×13)
P = 10000

4. Answer: (C)
According to question,
So, $70000 \times (1 - R/100)^2 = 47068$
$(1 - R/100)^2 = 47068/70000$
$(1 - R/100) = 82/100$
R/100 = 1 - 82/100
Therefore, R = 18%

5. Answer: (C)
Let, the amount Surbhi had lent be ₹x
So, interest = (x × 8 × 10)/100
According to question,
x - (x × 8 × 10)/100 = 560
100x - 80x = 56000
20x = 56000
x = 2800
Therefore, the amount Surbhi had lent = ₹2800

6. Answer: (C)
Total interest of 2 years = $10{,}000 \times ((1 + 1/10)^2 - 1) = ₹2{,}100$
Interest of first year = $10{,}000 \times ((1 + 1/10) - 1) = ₹1{,}000$
Therefore, interest amount of 2nd year = 2,100 - 1 ,000 = ₹1100

7. Answer: (E)
Let the sum be 'x' Rs.
$\frac{x\times8\times2}{100} + \frac{x\times10\times3}{100} + \frac{x\times6\times3}{100} = 12800$
$\frac{64x}{100} = 12800$
Sum = $12800 \times \frac{100}{64}$
= 20000 Rs.

8. Answer: (B)
At SI: SI = $\frac{1500\times12\times2}{100} = 360$
At CI: CI = $(1500 + P)\left[\left(1 + \frac{20}{100}\right)^2 - 1\right]$
$= (1500 + P)\left[\frac{36-25}{25}\right] = (1500 + P)\frac{11}{25}$
According to question
CI – SI = 652
$1500 \times \frac{11}{25} + \frac{11P}{25} - 360 = 652$
$\Rightarrow \frac{11P}{25} = 652 + 360 - 660$
$\Rightarrow P = 25 \times 32 = 800$

9. Answer: (B)
Total S.I. = $\frac{1800\times2\times20}{100} = Rs.720$
Total C.I. = $(1800 - p)\left[\left(1 + \frac{30}{100}\right)^2 - 1\right]$
$= (1800 - P) \times \frac{69}{100}$
ATQ, $(1800 - P) \times \frac{69}{100} - 720 = 315$

or, $(1800 - P) \times \frac{69}{100} \times 1035$
or, $1800 - P = 1500$
$\Rightarrow$ P = 300

10. Answer: (C)
SI (At 14%)
For two years = 28%
CI (@ 20%)
For two years equivalent = 44%
Difference $\Rightarrow$ CI – SI
44% of 1750 + 44% of P = 830
44% of P = 550
P = Rs. 1250

11. Answer: (E)
$A = 9100 \left(1 + \frac{20}{100}\right)^2$
$= 9100 \times \frac{36}{25}$
= Rs. 13104

12. Answer: (B)
Let the time of investment be x yr.
And the sum be Rs. y
ATQ,
$\frac{y \times 5 \times x}{100} = \frac{y \times 6 \times \left(x - \frac{1}{2}\right)}{100}$
$\Rightarrow 5x = 6x - 3$
$\Rightarrow$ x = 3 yr.
Amount in first case,
SI = $\frac{y \times 5 \times x}{100} = \frac{3y}{20}$
$\Rightarrow y + \frac{3y}{20} = 4600 \Rightarrow \frac{23y}{20} = 4600$
$\Rightarrow$ y = Rs. 4000

Answer (13 – 17):
Ratio of profit share of A, B and C is scheme S_1
80000 × 2 : 30000 × 3 : 50000 × 5
16 : 9 : 25
Profit share of A from scheme S_1
$= \frac{16}{50} \times 200{,}000$
= 64000
Profit share of B from scheme S_1
$= \frac{9}{50} \times 200{,}000$
= 36000
Profit share of C from scheme S_1
$= \frac{25}{50} \times 20{,}000$
= 100,000
Ratio of profit share of A and C in scheme S2
30,000 × 4 : 10,000 × 3
12 : 3
Profit share of A in scheme S_2 =
$= \frac{12}{15} \times 90000$
= 72000
Profit share of C in scheme S_2
$= \frac{3}{15} \times 90{,}000$

13. Answer: (D)
Required ratio = (36000 + 10000): 100, 000
= 46 : 100
= 23 : 50

14. Answer: (E)
Required% $= \frac{64000}{18000} \times 100 = \frac{3200}{9}\%$
$= 355\frac{5}{9}\%$

15. Answer: (A)
Required average = $\frac{64000 + 18000}{2}$
= 41000

16. What is the principle ?
Quantity I: A sum is invested for 3 year with CI. It earns 10123.2 Rs. with 12% rate of interest
Quantity II: A sum invested for 4 years with SI. It earns 14400 Rs. with 15% rate of interest.
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(A) Quantity I > Quantity II
(B) Quantity I < Quantity II
(C) Quantity I ≥ Quantity II
(D) Quantity I ≤ Quantity II
(E) Quantity I = Quantity II or no relation
Answer: (A)
Quantity I
Let principal = P
$P\left[\left(1 + \frac{r}{100}\right)^t - 1\right] =$ Interest
$P\left[\left(1 + \frac{12}{100}\right)^3 - 1\right] = 10123.2$
P = 25000
Quantity II
Let principal = P

Interest = $\frac{P \times r \times t}{100}$

P = $\frac{14400 \times 100}{15 \times 4} = 24000$

Quantity I > Quantity II

17. Answer: (B)

Then according to question,

$\left(x + \frac{x \times 3 \times 12}{100}\right) + \left(x + \frac{x \times 2 \times 12}{100}\right) + \left(x + \frac{x \times 1 \times 12}{100}\right)$

= 11160

$3x + \frac{x \times 6 \times 12}{100} = 11160$

$\frac{372x}{100} = 11160$

$x = 3000$

18. Answer: (A)

Total investment of A = 80,000 + 30,000

= 110,000

Total profit of A = 64000 + 72000

= 136000

Equivalent rate of Interest for 2 year at CI

= 20% + 20% + $\frac{20 \times 20}{100}$ = 44%

Required CI = $\frac{44}{100}(136000 + 110000)$

= 108240

19. Answer: (C)

$\frac{80000 \times R \times 3}{100} - 30000 \times \left(\frac{R+5}{100}\right) = 30,000$

$2400R - 300R - 1500 = 30000$

$8R - R - 5 = 100$

7R = 105

R = 15%

20. Answer:: (A)

The correct answer is Option 1 i.e. Rs. 2940

Let the rate of interest in case of simple interest be 'r%'

So,

14400 × 5 × r/100 = 3600

r = 5

Hence,

Compound interest earned on Rs 14,000

= 14000[(1 + 10/100)^2 – 1] = Rs. 2,940