B. Compound Interest

Eg (1): Find the compound Interest on 10,000 Rs. for 3 years at 11 %.

$P = 10,000$

$T = 3$ yrs.

$IR = 11\%$

$$A = P\left[1+\frac{IR}{100}\right]^t$$

Simple Method:

$A = P \times 1.(IR)$ (1 year)

$A = P \times 1.(IR) \times 1.(IR)$ (2 years)

$A = P \times 1.(IR) \times 1.(IR) \times 1.(IR)$ (3 years)

$= P \times 1.(11) \times 1.11 \times 1.11$

$= 10,000 \times 1.367631$

$A = 13676.31$

10,000 will become 13676.31.

Compound Interest = 3676.31

$a = 11 \quad b = 1$

111

100+11

$11^3 = 121 \times 11$

1331.

$1331 \times \frac{1}{11} = 121$

$121 \times \frac{1}{11} = 11$

1.

1331	121	11	1
	242	22	

1331000
36300
330
1

1367631

Eg 2: If Rs. 5000 is compounded at 18% for 2 yrs, Calculate the Amount after 2 years.

$$A = 5000 \times 1.18 \times 1.18$$

$$= \frac{10000}{2} \times 162.42$$

$$= 8121$$

$$A = 6962 \text{ Rs.}$$

$\frac{11}{a}\frac{8}{b}$

$11^3 = 1331$

$1331 \times \frac{8}{11} = 968$

$968 \times \frac{8}{11} = 88$

$8^3 = 216.$

1331 968 88 216

1936 176

2904 264

1331000

290400

2640

216

1624256

Eg 3: Find the compound Interest & Amount on the principal Rs. 20,000 borrowed at 6% compounded annually for 3 years.

$$A = 20,000 \times 1.06 \times 1.06 \times 1.06$$

$$= 20,000 \times 1.19$$

$$= 2380000$$

$$A = 23800$$

$$CI = 3800$$

$\overset{a}{1}\overset{b}{0}6$

$10^3 = 1000$

$1000 \times \frac{6}{10} = 600$

$600 \times \frac{6}{10} = 360$

$6^3 = 216$

1000	600	360	216
	1200	720	

1080

64×8 = 512

36×6

1000000

180000

10800

216

1.191016

Eg 4: Find the compound Interest & amount on the principal Rs. 7000 borrowed at 4% compounded annually for 2 yrs.

$$A = 7000 \times 1.04 \times 1.04$$

$$= 7000 \times 1.08$$

$$= 7.56 \times 1000$$

$$A = 7560$$

$$CI = 560$$

104^2

$(100)^2 + 2(100)(4) + 4^2$

$10000 + 800 + 16$

10816

Eg 5: Find the compound Interest on Rs. 2500 invested at 6% p.a., compound semi-annually for 8 years? 1.03?

-4011.73
=1511.73.

Eg 6: Find compound interest on Rs. 5000 invested at 8% per. annually, compound semi-annually for 2 yrs?

Ans 5:

$$A = P\left[1 + \frac{R/2}{100}\right]^{2T}$$

$$A = P\left[1 + \frac{6/2}{100}\right]^{2\times 8}$$

$$A = 2500\left[1 + \frac{3}{100}\right]^{16}$$

$$= 2500[1.03]^{16}$$

$$= 2500[1.6047]$$

$$= 4011.73$$

$$CI = 1511.73$$

Ans 6: $A = P\left[1 + \frac{R/2}{100}\right]^{2T}$

$$= 5000\left[1 + \frac{8/2}{100}\right]^{2\times 2}$$

$$= 5000[1.04]^4$$

$$= 5000[1.1698]$$

$$A = 5849.29$$

$$CI = 849.29.$$

Q7. Find the compound amount which would be obtained from the interest of Rs. 2000 at 4% compounded quarterly for 5 yrs.

$$A = 2000\left[1+\frac{R/4}{100}\right]^{4\times T}$$

$$= 2000\left[1+\frac{4/4}{100}\right]^{4\times 5}$$

$$= 2000[1.01]^{20}$$

$$A = \underline{2440.38}$$

$$CI = \underline{440.38}$$

Q8. Find the compound amount which would be obtained from the interest of Rs. 6000 at 8% compounded quarterly for 3 yrs.

$$A = 6000\left[1+\frac{R/4}{100}\right]^{4T}$$

$$= 6000\left[1+\frac{8/4}{100}\right]^{4\times 3}$$

$$= 6000[1.02]^{12}$$

$$= \underline{7609.45}$$

$$CI = 1609.45$$

Q9. If the rate of compound interest for the first & the second year be 4% & 3% respectively. Find the amount & the compound Interest of Rs. 12,000 in 2 years.

$$A = P\left[1+\frac{R_1}{100}\right]\left[1+\frac{R_2}{100}\right]$$

$$= P\left[1+\frac{4}{100}\right]\left[1+\frac{3}{100}\right]$$

$$= 12,000(1.04)(1.03)$$

$$= \underline{12854.4}$$

$$\underline{CI = 854.4}$$

$$A = 12,000 \times 1.04 \times 1.03$$

$$= 12,000 \times 1.0712$$

$$= 12854.4$$

$$\begin{array}{r} 104 \\ 103 \\ \hline 107012 \end{array}$$

$$1.0712$$

Q. 10 If the rate of compound Interest for the first & second year be 5% & 2% respectively. Find the amount & the compound interest on Rs. 8000 in 2 years.

$$A = 8000 \times 1.05 \times 1.02$$
$$= 8000 \times 1.071$$
$$= 8568$$

$$CI = 568$$

$$\begin{array}{r} 105 \\ \times\ 102 \\ \hline 10710 \end{array}$$

Q. 11: Find the compound Interest on Rs. 5000 for 3 years at 8% p.a. compounded annually (year wise soln.)

Y1:
$P = 5000$ Rs.
$T = 1$ yr.
$R = 8\%$ p.a.

$$SI = \frac{5000 \times 1 \times 8}{100} = 400$$

$$A = 5400$$

Y2:
$P = 5400$ Rs.
$T = 1$ yr.
$R = 8\%$

$$SI = \frac{5400 \times 1 \times 8}{100} = 432$$

$$A = 5400 + 432 = 5832$$

Y3:
$P = 5832$
$T = 1$ yr.
$R = 8\%$

$$SI = \frac{5832 \times 1 \times 8}{100} = 466.56$$

$$A = 5832 + 466.56 = 6298.56$$
$$CI = 6298.56 - 5000 = 1298.56$$

Q12: Find the compound Interest on Rs. 4000 for 2 yrs. at 4% P.A., compounded annually (year wise soln.).

I. Find the compound Amount & compound Interest of the following.

a. P = Rs. 7500, R = 6%, T = 2 years
A = ? C.I. = ?

b. P = Rs. 10,000, R = 8%, T = 2 years
A = ? C.I. = ?

c. P = Rs. 70,000, R = 4%, T = 2 years
A = ? C.I. = ?

d. P = Rs. 3000, R = 2%, T = 3 years
A = ? C.I. = ?

e. P = Rs. 2300, R = 12%, T = 2 years
A = ? CI = ?

f. P = Rs. 4200, R = 8%, T = 1 year
A = ? CI = ?

g. P = Rs. 6200, R_1 = 8%, R_2 = 4%, T = 2 years
A = ? CI = ?

h. P = Rs. 3200, R_1 = 4%, R_2 = 2%, T = 2 years
A = ? CI = ?

i. P_1 = Rs. 6200, P_2 = ?, R = 3%, T = 2 years
A = ? CI = ?

j. P_1 = Rs. 2000, P_2 = ?, R = 7%, T = 2 years
A = ? CI = ?

II. Solve the following.

1. Find the compound amount and compound interest on the principal Rs. 8000 borrowed at 2% compounded annually for 4 years.

2. Find the compound amount and compound interest on the principal Rs. 12000 borrowed at 3% compounded annually for 2 years.

3. Find the compound interest on Rs. 6500 invested at 8% annually, Compound semi-annually for 2 years.

4. Find compound interest on Rs. 5000 invested at 4% annually, compound semi-annually for 3 years.

5. Find the compound amount which would be obtained from the interest of Rs. 9000 at 12% compounded quarterly for 2 years.

6. Find the compound amount which would be obtained from the Interest of 11000 at 4% compounded quarterly for 1 year.

7. If the rate of compound interest for the first & second year be 5% & 4% respectively, find the amount & the compound interest in 2 years.

8. If the rate of compound interest for the first & second year be 2% and 6% respectively, find the amount and the compound Interest on Rs. 10,000 in 2 years.

9. Find the amount and the compound interest on Rs. 16000 for 3 years at 5% per annum compounded annually.

10. Find the amount & the compound interest on Rs. 2500 for 2 years at 10% per annum, compounded annually.