A. Activities

1. Let cost of machinery = ₹ 10,00,000

    Scrap value of machinery = ₹ 50,000

    Effective life of machinery = 12 years

    Rate of interest = 5% p.a.

    $\therefore i = \dfrac{\boxed{5}}{100} = \boxed{0.05}$, $n = \boxed{12}$ years

    $A = 1000000 - \boxed{50,000} = ₹\ 9,50,000$

    $\because A = \dfrac{c}{i}\left[(1+i)^n - 1\right]$

    $\boxed{9,50,000} = \dfrac{c}{\boxed{0.05}}\left[1.797 - \boxed{1}\right]$

    $\therefore c = \dfrac{9,50,000 \times 0.05}{\boxed{0.797}} = ₹\ 59,584.4$

2. Given c = ₹ 2,000

    Rate of interest per quarter $= \dfrac{16}{\boxed{4}} = \boxed{4}\ \%$

    $\therefore r = \boxed{4}\ \%$

    $\therefore i = \dfrac{r}{100} = \dfrac{4}{\boxed{100}} = \boxed{0.04}$

    No. of quarters (n) = 4

    $\therefore A^{1} = \dfrac{c(1+i)}{i}\left[(1+i)^n - 1\right]$

    $= \dfrac{\boxed{2000}(1+0.04)}{\boxed{0.04}}\left[(1+0.04)^{\boxed{4}} - 1\right]$

    $= \dfrac{2000\left(\boxed{1.04}\right)}{0.04}\left[1.1698 - \boxed{1}\right]$

    $= 50,000\,(1.04)\,\left(\boxed{0.1698}\right)$

    $= ₹\ \boxed{8,829.6}$

3. Let value of the goods be ₹ x, value of the godown = ₹ 4,000

Premium at the rate of 2% is ₹ 124

$$\therefore \frac{2}{100} \times \boxed{\boxed{x+4000}} = \boxed{124}$$

$$\therefore 4000 + \boxed{x} = \boxed{6200}$$

$$\therefore x = \boxed{2200}$$

∴ value of the goods = ₹ 2200

4. Let value of the building = ₹ x

$$\therefore \text{Policy value} = \frac{7}{8} \times \text{property value}$$

$$= ₹ \boxed{\frac{7x}{8}}$$

Rate of interest = 2.8%

$$\text{Amount of premium} = \frac{2.8}{\boxed{100}} \times \frac{\boxed{7}\,x}{8}$$

Rate of commission = 15%

Amount of commission = ₹ 882

$$\therefore \text{Amount of commission} = \frac{\boxed{15}}{100} \times \text{Premium}$$

$$\therefore 882 = \frac{15}{100} \times \frac{2.8}{\boxed{100}} \times \frac{7x}{\boxed{8}}$$

$$\therefore x = \frac{\boxed{882} \times 10,000 \times 8}{\boxed{15} \times 2.8 \times \boxed{7}} = ₹ 2,40,000$$

∴ value of the building is ₹ $\boxed{2,40,000}$

B. Solve the Following

Q.1 Stock worth ₹ 3,75,000 was insured for ₹ 2,25,000. Stock worth ₹ 1,50,000 was burnt completely due to fire and the balance was reduced to 75% of its value. What sum can be claimed under the policy?

Soln : Property Value = Rs 3,75,00

Policy value = Rs 2,25,000

Loss = Rs 1,50,000 ———①

Balance stock after loss = 3,75,000 − 1,50,000

= Rs 2,25,000

Loss from balance = 25% of ₹2,25,000

$$= Rs\ 56,250 \longrightarrow ②$$

From ① & ②, Total Loss $= 1,50,000 + 56250$

$\therefore$ Total loss $= Rs\ 2,06,250$

$$Claim = \frac{Policy\ Value}{Property\ Value} \times loss$$

$$= \frac{2,25,000}{3,75,000} \times 2,06,250 \ ✦$$

$$\therefore \boxed{Claim = Rs\ 1,23,750}$$

A sum of Rs 1,23,750 can be claimed

Q.2 A person buys a television paying ₹ 20000 in cash and promising to pay ₹1000 at the end of every month for the next two years. If money is worth 12% p.a., converted monthly, what is the cash price of the television?

Soln: Person buy a television in cash for Rs 20,000

$\therefore$ First payment $= Rs\ 20,000$

Remaining value of the television was paid in monthly instalment of Rs 1000 $\therefore C = Rs\ 1000$

Also given, $R = 12\% = 1\% \Rightarrow i = \frac{R}{100} = \frac{1}{100} = 0.01$, $n = 2\ yrs$
$\frac{R}{12}$

For annuity immediate $\therefore n = 2 \times 12 = 24$

Present Value $P = \frac{C}{i}\left[1 - (1+i)^{-n}\right]$

$$= \frac{1000}{0.01}\left[1 - (1 + 0.01)^{-24}\right]$$

$$= 1,00,000\left[1 - (1.01)^{-24}\right]$$

$$= 1,00,000\left[1 - 0.7875\right]$$

$$= 1,00,000\left[0.2125\right]$$

$$\therefore \boxed{P = Rs\ 21,250}$$

Cash Price $=$ Present Value $+$ First payment

$$= 21,250 + 20,000$$

$$\therefore \boxed{Cash\ Price = Rs\ 41,250}$$

Q.3 The machinery is expected to cost 25% more over its present cost of ₹ 696000 after 20 years. The scrap value of the machinery will realize ₹ 150000. What sum should be set aside at the end of each year at 5% p.a. compound interest for 20 years to replace the machinery? [Given $(1.05)^{20} = 2.655$]

Soln :

Present Cost = Rs 6,96,000

Given that machinery cost is expected 25% more than present Cost

$\therefore$ Expected cost = 25% of 6,96,000 + 6,96,000

$$= \frac{25}{100} \times 696000 + 696000$$

$$= 1,74,000 + 6,96,000$$

$\therefore$ Expected Cost = Rs 8,70,000

Scrap value = Rs 1,50,000   (given)

$\therefore$ Sinking fund = Expected cost − Scrap value

$$= 8,70,000 - 1,50,000$$

$\therefore$ Sinking fund = Rs 7,20,000

$\therefore$ A = Rs 7,20,000

Also given n = 20 yrs , r = 5% p.a

$\therefore$ $i = \frac{r}{100} = \frac{5}{100} = 0.05$

We have $A = \frac{C}{i}\left[(1+i)^n - 1\right]$

$\therefore$ $7,20,000 = \frac{C}{0.05}\left[(1+0.05)^{20} - 1\right]$

$\therefore$ $7,20,000 \times 0.05 = C\left[(1.05)^{20} - 1\right]$

$\therefore 36,000 = C\left[2.655 - 1\right]$

$\therefore 36000 = C\left[1.655\right]$

$\therefore C = \frac{36000}{1.655} = 21,752.2659$

$\therefore \boxed{C = Rs\ 21,752.26}$

$\therefore$ Sum of Rs 21,752.26 should be set aside.

Sign of Teacher :