

6 Time Value of Money

80

$$1 + \frac{P}{100}$$

Q1

(a) £250 at 5% p.a. over 4 years

$$250 \times (1.05)^4 = 303.88 \leftarrow \text{Final Value}$$

$$\text{Total interest Paid} = £303.88 - £250 \\ = £53.88$$

(b) £4000 at 6% p.a. over 3 years

$$4000 \times (1.06)^3 = £8,337.12 \leftarrow \text{Final Value}$$

$$\text{Total interest Paid} = 8,337.12 - 4000 \\ = £1,337.12$$

(c) £170 at 4.6% p.a. over 5 years

$$170 \times (1.046)^5 = £212.87 \leftarrow \text{Final Value}$$

$$\text{Total interest Paid} = 212.87 - 170 \\ = £42.87$$

Q2

(i) £5000 for 5 years at 8% p.a. paid annually

$$5000 \times (1.08)^5 = £7,380.72$$

(ii) £5000 for 5 years at 8% p.a. paid half yearly

$$5000 \times (1.04)^{10} = £7,401.22$$

$$\frac{8}{2} = 4 = 1.04 \text{ each half-year}$$

(iii) £5000 for 5 years at 7% p.a. paid quarterly

$$5000 \times (1.0175)^{20} = £7,073.89$$

$$\frac{7}{4} = 1.75 \\ = 1.0175$$

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Assignment

Q1

(a)(i) calculate a fixed base index for 2006 - 2010 using 2006 as base year

Year	Turnover (2006=100)	Fixed Base Index
2006	105	100
2007	108	$\frac{108}{105} \times 100 = 102.9$
2008	101	$\frac{101}{105} \times 100 = 96.2$
2009	107	$\frac{107}{105} \times 100 = 101.9$
2010	109	$\frac{109}{105} \times 100 = 103.8$

(B)(i) Laspeyres index of price for Years 2 & 3 using Y1 as base year and Number as weight.

	WT (Y ₁ =100)	Y ₁	Y ₂	Y ₃
Forks	60	14	840	840
Spades	85	13	1105	1105
Shears	20	27	540	540
			<u>2525</u>	<u>2690</u>

$$\text{Year 2} = \frac{2525}{2425} \times 100 = 104.1$$

$$\text{Year 3} = \frac{2690}{2425} \times 100 = 110.9$$

(ii) Paasche index for price for Year 3 only using Y1 as base year and Number as weight.

	WT(Y ₃)	Y ₃	Y ₁
Forks	60	16	960
Spades	70	14	980
Shears	30	27	810
			<u>2750</u>
			<u>2470</u>

$$\text{Year 3} = \frac{2750}{2470} \times 100 = 111.3$$