

- 1 Tom Logan, a pension fund manager, estimates that the fund's sponsor will make a £5m contribution 4 years from now to fund a liability which falls due 6 years later. If the fund is able to earn a 7% annual return on investment over the holding period the amount available at maturity will be closest to:
- A £7,100,000.00
  - B £7,503,651.76
  - C £9,835,756.79
- 2 IOS are considering making an investment into their pension fund of £1m in two years time from now and a further £2.5m in three years from now. If returns on assets are constant at 5% how much will be available in 10 years from now.
- A £3.9966m
  - B £4.9248m
  - C £4.9952m
- 3 DHB is considering investing £3m in assets now which he believes can be invested at 8% for the next 5 years. He then intends adding a further £1m and investing the entire fund value in assets which will return 5%. How much does he have at the end of year 10.
- A £5.62588m
  - B £6.9021m
  - C £7.9461m
- 4 Cautious Financial have a stated interest rate of 1% per week. Assuming a 52 week year what is the nominal and effective annual interest rate?
- A Nominal = 67.77%; Effective = 52%
  - B Nominal = 67.77%; Effective = 67.77%
  - C Nominal = 52%; Effective = 67.77%

- 5 Dmitry Kaverina intends paying for his daughter's college fees when she reaches the age of 18. If Dmitry wants to have saved €90,000 in 10 years time and thinks returns over that period will average 8% what must be the value of ten equal annual deposits starting 1) now and 2) starting in a year's time.
- A Now = €5752.46; + 1 year = €6212.65  
 B Now = €6212.65; + 1 year = €6709.67  
 C Now = €6212.65; + 1 year = €5752.46
- 6 Vicente Cozzolli has just won a lottery prize offering a choice of €1,000,000 or €50,000 a year for life. He is unsure which to choose and asks you for advice. Firstly, he asks you which is the best choice assuming life expectancy of fifty years and interest rates of 5%. Secondly he asks you for a life expectancy at which he would be ambivalent between the two options.
- A Part 1 €50,000 p.a.; Part 2 4.43%  
 B Part 1 €1m now; Part 2 4.43%  
 C Part 1 €1m now; Part 2 4.50%
- 7 Vivienne Ho is analyzing a firm that has reported most recent annual EPS of £3.25; £2.75; £4.15; £5.65; £4.67 and £5.85 (from earliest to latest). The average compound growth rate is closest to
- A 10.292%  
 B 12.475%  
 C 16.000%
- 8 What is the effective annual interest rate of 6% compounded quarterly, monthly and continuously?
- A 6.136%; 6.168% and 6.184%  
 B 6.090%; 6.152% and 6.184%  
 C 6.136%; 6.168% and 6.172%

- 9 Gala Nasr is saving for retirement. She is currently 40 years old and intends to retire fully at 65 having cut down on her work once she reaches 60. She intends saving \$20,000 at the end of each year until she is 60 (20 payments). When she reaches 60 her salary will be reduced to cover her living expenses but not provide for further saving however her pension fund will grow throughout at 7%. The amount available on her 65<sup>th</sup> birthday to purchase a pension will be closest to:
- A \$819,909.84
  - B \$1,149,965.97
  - C \$1,264,980.75
- 10 Smarts Msimang is planning for his retirement. Smarts is celebrating his 25<sup>th</sup> birthday by doing some retirement planning. He considers that he will be able to afford savings of \$1,500 at the end of each of the next 15 years and is willing to take risks in order to earn a return of 11% over this time. He considers that when he is in his 40s he will be able to save more but take less risk. He wishes to retire at 65 and with a pension fund of \$750,000. Assuming he can earn an 8% return in this second saving phase what should Smarts be aiming to save in this second 25-year period?
- A \$5,424.51
  - B \$5,858.47
  - C \$15,093.66

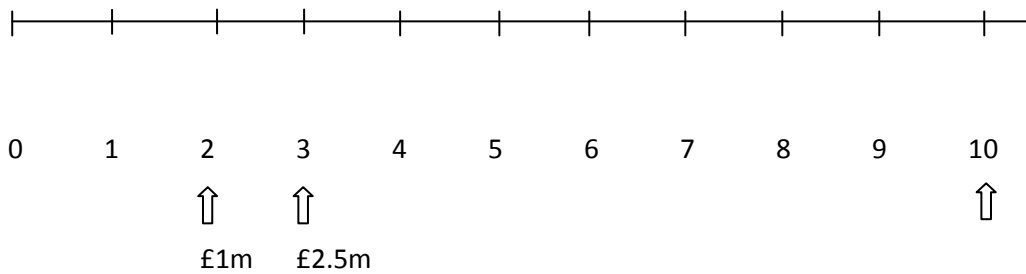
## Solutions

1 Correct: B



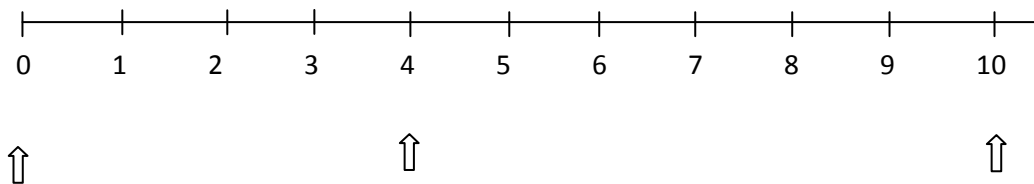
$$\text{£5m} \times 1.07^6 = \text{£7,503,651.76}$$

2 Correct: C



$$\text{£1} \times 1.05 = \text{£1.05m} + 2.5\text{m} = \text{£3.55m} \times 1.05^7 = \text{£4.9952m}$$

3 Correct: B



$$\text{£3m} \times 1.08^5 =$$

$$\text{£4.4080m} + \text{£1m} =$$

$$\text{£5.4080m} \times 1.05^5 =$$

$$\text{£6.9021m}$$

4 Correct: C

$$\text{Nominal} = 1\% \times 52 = 52\%$$

$$\text{Effective} = 1.01^{52} - 1 = 67.77\%$$

5 Correct: A

$$\text{As an ordinary annuity } 10 \text{ N; } 8 \text{ I/Y; } 90000 \text{ FV; CPT PMT} = \text{€6212.65}$$

$$\text{As an annuity due } \text{€6212.65} \div 1.08 = \text{€5752.46}$$

6 Correct: B

For part 1 the PV of the annuity is 50 N; 5 I/Y; 50000 PMT; CPT PV = €912,796

For part 2 set 1000000 PV; 50 N; 50000  $\boxed{+/-}$  PMT; CPT I/Y =

7 Correct: B

$$(5.85 \div 3.25)^{0.2} - 1 = 0.12475$$

Count the *number of periods of growth* not just the number of periods

8 Correct: A

Quarterly  $1.015^4 - 1 = 0.06136$

Monthly  $1.005^{12} - 1 = 0.06168$

Continuously  $0.06 \boxed{2nd} \boxed{[e^x]} \boxed{=} - 1 = 0.06172$

9 Correct: B

*From 40 – 60*

20 N; 7 I/Y; 20000 PMT, CPT FV = 819,909.8464

From 60 – 65  $819,909.8464 \times 1.07^5 = \$1,149,965.97$

10 Correct A

*From 25 – 40*

15 N; 11 I/Y; 1500 750000 PMT; CPT FV = -51608.0385

*From 40 – 65*

-51608.0385 PV ; 750000 FV; 25 N; 8 I/Y; CPT PMT = -5,424.51

(Smarts is effectively giving up the 51608 as well as the annual payments of 5,424.51 in order to receive the \$750,000)