Free-Standing Mathematics Qualification
Higher Level

Financial Calculations 4984

Specimen Question Paper

MODEL SOLUTIONS

Section A

Answer **all** questions in the spaces provided.

Use **Electronic sale** *from page 2 of the Data Sheet.*

Electronic Sale

A hypermarket advertises the following sale offers.

42" PLASMA TV Was £1499 ***NOW £1199***	**ALL CD PLAYERS** ***15% OFF***
$\frac{1}{3}$ **OFF** **ALL** **DVD RECORDERS**	**21% OFF** **ALL LCD TVs**

Section A

Answer **all** questions in the spaces provided.

Use **Electronic sale** *from page 2 of the Data Sheet.*

1 (a) An LCD TV costs £ 799 before the sale.
Jane bought this television in the sale.

How much did Jane pay for the television?

£799 x 0.21 = £167.79

£799 - £167.79 = £631.21

(3 marks)

1 (b) Kylie bought a DVD recorder in the sale.
The usual price of the DVD recorder was £ 168.99

How much was Kylie charged?

£168.99 ÷ 3 = £56.33

£168.99 - £56.33 = £112.66

(3 marks)

Section A

Answer **all** questions in the spaces provided.

Use **Electronic sale** *from page 2 of the Data Sheet.*

2 Daniel and Lily agree to spend £ 720 on a new television.
They decide to divide the cost in the ratio of 2 : 3, with Lily paying more.

How much does Lily pay?

2 + 3 = 5 shares

1 share = £720 ÷ 5 = £144

£144 x 3 = £432

(3 marks)

Lily pays £432

Section A

Answer **all** questions in the spaces provided.

Use **Electronic sale** *from page 2 of the Data Sheet.*

3 The cost of a DVD recorder in the USA is $ 124.
The exchange rate is $ 1.99 to £ 1.

Find this cost in pounds.

$124 ÷ $1.99 = £62.3115577889

(3 marks)

£62.31|15577889

less than 5

Cost in pounds is £62.31

Section B

Answer **all** questions in the spaces provided.

Use **Bank accounts** *from page 3 of the Data Sheet.*

Bank Accounts

The Shropshire Exchange Bank has a number of different savings accounts which are listed in the table below.

Account name	Rate of interest
Platinum	3.4 % paid annually
Goldstar	1.73 % paid every 6 months
Silver	0.83 % paid every 3 months
Instant Access	0.1 % paid annually

Section B

Answer **all** questions in the spaces provided.

Use **Bank accounts** *from page 3 of the Data Sheet.*

4 Imran deposits £ 1200 in the Goldstar account for 18 months.
It earns compound interest at the rate of 1.73 % paid every 6 months.

	Starting value (£)	Interest (£)	Final value (£)
First 6 months	1200.00	20.76	1220.76
Second 6 months	1220.76	21.12	1241.88
Third 6 months	1241.88	21.48	1263.36

Complete the table above.

(4 marks)

Space for working

Step 1: Convert the interest rate % to a decimal 1.73% ÷ 100 = 0.0173

Step 2: Check you can calculate the interest payment given in the table

£1200 x 0.0173 = £20.76 ← *Yes! This matches the value in the table!*

Step 3: Calculate the next interest payment

£1220.76 x 0.0173 = £21.119148

= £21.12 (nearest penny)

Step 4: Add next interest payment to starting value

£1220.76 + £21.12 = £1241.88

Step 5: Final value becomes next starting value

Step 6: Repeat from Step 3 until done!

£1241.88 x 0.0173 = £21.484524

= £21.48

£1241.88 + £21.48 = £1263.36

Section C

Answer **all** questions in the spaces provided.

Use **Easter eggs** *from page 3 of the Data Sheet.*

5 A spreadsheet is used to find the total weight (chocolate and packaging) of each of the five Easter eggs, and to find the percentage of the total weight which is chocolate.

	A	B	C	D	E
1	**Easter egg**	**Weight of chocolate (ounces)**	**Weight of packaging (ounces)**	**Total weight of Easter egg (ounces)**	**Percentage of total weight which is chocolate**
2	Celebration	12	6	*18*	*66.7*
3	Crunchie	20.5	8.5	*29*	*70.7*
4	Galaxy	14	5.5	*19.5*	*71.8*
5	Maltesers	13.5	6.5	*20*	*67.5*
6	Toblerone	8	4	*12*	*66.7*

5 (a) Complete the spreadsheet to give the percentages of the total weights which are chocolate.

Give the percentages to one decimal place.

(5 marks)

Space for working

In these questions ALWAYS divide by the PERCENTAGE OF amount to calculate your percentage (even if you get a % greater than 100% - it can happen!)

$\frac{12}{18}$ *x 100% = 66.7% (1dp)*

$\frac{20.5}{29}$ *x 100% = 70.7% (1dp)*

$\frac{14}{19.5}$ *x 100% = 71.8% (1dp)*

$\frac{13.5}{20}$ *x 100% = 67.5% (1dp)*

$\frac{8}{12}$ *x 100% = 66.7% (1dp)*

5 (b) State a formula which would give the content of cell E5.

$\frac{B5}{D5} \times 100$

(1 mark)

Section D

Answer **all** questions in the spaces provided.

Use **Taxation 2008-2009** *from page 4 of the Data Sheet.*

Income Tax 2008 – 09

How your tax is calculated.
Find your taxable income by subtracting your tax free allowance from your annual income.
You pay Income tax at 20 % on the first £ 35 200 of your taxable income.
You pay Income tax at 40 % on your taxable income above £ 35 200.

6 Christopher earns £ 3780 per month and has a tax free allowance of £ 5225.

Calculate:

6 (a) Christopher's taxable income;

.....

Step 1: Calculate ANNUAL INCOME

£3780 x 12 = £45,360

.....

(3 marks)

Step 2: Take off TAX ALLOWANCE

£45,360 - £5225 = £40,135

Taxable Income = £40,135

Section D

Answer **all** questions in the spaces provided.

Use **Taxation 2008-2009** *from page 4 of the Data Sheet.*

Income Tax 2008 – 09

How your tax is calculated.
Find your taxable income by subtracting your tax free allowance from your annual income.
You pay Income tax at 20 % on the first £ 35 200 of your taxable income.
You pay Income tax at 40 % on your taxable income above £ 35 200.

6 (b) the amount of Income tax which Christopher pays in the year.

Taxable Income = £40,135

Basic Rate Tax Paid = £35,200 x 0.2 = £7040

Income ABOVE Basic Rate Tax Threshold

= £40,135 - £35,200

= £4935

Higher Rate Tax Paid = £4935 x 0.4 = £1974

(5 marks)

TOTAL Tax Paid =£7040 + £1974 = **£9014**

Section E

Answer **all** questions in the spaces provided.

Use **Cost of borrowing money** *from page 4 of the Data Sheet.*

Cost of borrowing money

The cost of borrowing money depends on the amount borrowed, the length of the repayment period and the interest rate (APR).
It is usually true that if you borrow a larger amount of money, then the APR you are charged for the loan will become smaller.

Note: On 12 February 2007, these were the standard rates for a loan taken out over a period of five years. The rates change frequently. If the person borrowing the money is a customer of the bank, a lower rate may be offered. If the person is regarded by the bank as an unreliable borrower, then a higher rate may be charged.

	Lowest tier			Second tier	
Lender	**APR**	**Loan amount**		**APR**	**Loan amount**
Bradford and Bingley	13.9%	Up to £4950		6.7%	£4951 – £25 000
Co-operative Bank	16.9%	Up to £4950		6.9%	£4951 – £25 000
Direct Line	14.9%	Up to £4999		6.4%	£5000 – £25 000
Lloyds Bank	17.9%	Up to £4999		10.9%	£5000 – £7499
Lombard Direct	14.9%	Up to £4999		6.7%	£5000 – £25 000

Section E

Answer **all** questions in the spaces provided.

Use **Cost of borrowing money** *from page 4 of the Data Sheet.*

7 Pamela wishes to borrow £ 4950 from the Co-operative Bank and to repay the loan over five years.

7 (a) If Pamela borrows £ 4950 she is charged an APR of 16.9 %
The monthly repayment for this loan is £ 119.63.

By finding the total repayments which Pamela makes over five years to repay the loan, calculate the total interest which she would be charged for borrowing this money.

£119.63 x 12 x 5 = £7177.80

£7177.80 - £4950 = £2227.80

(3 marks)

7 (b) If Pamela borrows £ 5000 she is charged an APR of 6.9 %. Her monthly repayment would be £ 98.28 per month.

Calculate the total interest over five years which she would be charged for borrowing £ 5000.

£98.28 x 12 x 5 = £5896.80

£5896.80 - £5000 = £896.80

(2 marks)

7 (c) Hence find the reduction in the interest charged which Pamela obtains by borrowing £ 5000 rather than £ 4950.

£2227.80 - £896.80 = £1331

(1 mark)

Section F

Answer **all** questions in the spaces provided.

8 Kim buys two jumpers which cost £ 3 each. This price is given to the nearest pound.

What is the maximum cost to Kim of the two jumpers?

Upper bound of price for 1 jumper = £3.49

.....

.....

(2 marks)

Upper bound of price for 2 jumpers

= £3.49 x 2 = £6.98

9 In 2007, the number of tickets sold for the Glastonbury Festival was 137 550. This was an increase of 22.8% on the number sold in 2005.

How many tickets were sold in 2005?

In this REVERSE PERCENTAGE question you need to recognise that the number of tickets sold in 2007 is 122.8% of the tickets sold in 2005. Once you understand that, the rest is easy!

(3 marks)

Year	Percentage	Tickets
2005	100%	?
2007	122.8%	137,550

1% of 2005 tickets = 137,550 ÷ 122.8 = 1120.114006

100% of 2005 tickets = 1120.114006 x 100

= 112011 (to nearest ticket)

10 A shopkeeper normally sells a coat at a price that includes a mark up of 100 % for profit.
When she sells the coat in a sale she still wants to make a profit of 20 %.

By what percentage does the shopkeeper reduce the price of the coat in the sale?

£100 + £100 = £200

£100 + (0.2 x £100) = £120

change in price = £200 - £120 = £80 *(4 marks)*

$$\frac{\text{change}}{\text{original}} = \frac{80}{200} = 0.4$$

0.4 as a percentage is 40%

11 Samuel invests £S. Interest is paid at the fixed rate of 0.27 % per month.
After n years, the amount of money which Samuel will have as a result of his investment is £P, where P is given by

$$P = S \times 1.0027^{12n}$$

11 (a) Samuel invests £8000 for 1 year.
Use the formula to find the total amount of money which Samuel will have at the end of the year.

$P = £8000 \times 1.0027^{(12 \times 1)}$

= £8263.083973

= £8263.08

(3 marks)

11 (b) Hence find the A.E.R. (Annual Equivalent Rate) for this investment.

$$\frac{£263.08}{£8000} \times 100\% = 3.2885\% = 3.29\%$$

(2 marks)

END OF QUESTIONS