Numerical Reasoning
Practice Test 10

Solution Booklet

Last updated: 20-09-2011

	Sales (£millions)						
	US (Jan-June)	US (July-Dec)	Annual US Sales Target	EU (Jan-June)	EU (July-Dec)	Annual EU Sales Target	Worldwide Sales (Jan-Dec)
Product A	54.5	50.5	110	90.5	91.4	180	320
Product B	61.1	59.2	120	72.2	77.8	160	300
Product C	60.5	58	120	88	92.2	180	330
Product D	76.5	74.1	150	105.3	98.2	200	380
Product E	72.7	78.2	150	89.2	94.8	190	350

Q1 If worldwide sales comprise US sales, EU sales and Far Eastern sales, which products had the highest annual Far Eastern Sales?

Product A Product B Product C Product D Product E

Step 1 - sum the half-yearly US and the EU sales to get the annual sales for each product;

	US annual sales	*EU annual sales*	*US annual sales + EU annual sales*
Product A	*105*	*181.9*	*286.9*
Product B	*120.3*	*150*	*270.3*
Product C	*118.5*	*180.2*	*298.7*
Product D	*150.6*	*203.5*	*354.1*
Product E	*150.9*	*184*	*334.9*

Step 2 – calculate Far Eastern sales for each product (= worldwide sales - US annual sales + EU annual sales)

Product A	***320 - 286.9 = 33.1***
Product B	*300 - 270.3 = 29.7*
Product C	*330 - 298.7 = 31.3*
Product D	*380 - 354.1 = 25.9*
Product E	*350 - 334.9 = 15.1*

***Tip:** in practice, when the time is ticking, you wouldn't bother writing down the sums; you'd just enter the numbers for each product straight into your calculator and write down the Far Eastern Sales. You're also less likely to make a data-entry mistake this way.*

Thus the correct answer is Product A

Q2 For the five products combined there was a difference between total annual Sales and the total annual Sales Target. How did this difference compare for the US and the EU?

£27.1 million (US); £25.8 million (EU)
£638.3 million (US); £908.2 million (EU)
£4.7 million (US); £10.4 million (EU)
£271.7 million (US); £258.2 million (EU)
Can't tell

Step 1 – sum the Jan-June sales (US) and the July-Dec sales (US)
325.3 + 320 =£645.3 million

Step 2 – calculate the difference compared to the US target (£650 million)
650 –645.3 = £4.7 million

Step 3 – sum the Jan-June (European) and the July-Dec sales (EU)
445.2 + 454.4 = £899.6 million

Step 4 – calculate the difference compared to the European target (£910 million)
910 – 899.6 = £10.4 million

***Tip:** in this question, it would have been possible to answer the question after working out just the US difference, but this is often not the case.*

Thus the correct answer is £4.7 million (US); £10.4 million (EU)

Q3 If the annual EU sales for Products B and C comprise online: offline sales in a ratio of 2:3 then what are the online combined sales for Products B and C?

£198,120,000
£19,812,000
£13,208,000
£132,080,000
None of These

Step 1 – calculate the EU sales for Products B and C
88.0 + 92.2 + 72.2 + 77.8 = 330.2 (£million)

Step 2 – use the ratio to find online sales.
online: offline = 2:3
330.2 = 2x + 3x = 5x
x = 330.2/5 = 66.04
online sales = 2x = 132.08

***Tip:** in practice it's quicker to just multiply 330.2 by (2/5) to obtain the ratio.*

Thus the correct answer is £132,080,000

Q4 US annual sales tax was 24% on the first £130 million of sales, 0% thereafter. EU annual sales tax was 22% on all sales. How much annual tax is due for Products B, C and D combined (to the nearest £million)?

£244 million £211 million **£149 million** £243 million £120 million

Step 1 - Calculate the US sales tax for Products B, C, D combined.

	US annual sales	*US Sales tax on first £130 million only*
Products B, C, D	*120.3 + 118.5 + 150.6 = 389.4*	*130 x 0.24 = 31.2 (£million)*
Total US sales tax = £31.2 million		

Step 2 - Calculate the European sales tax

	EU annual sales	*EU sales tax*
Products B, C, D	*150 + 180.2 + 203.5 = 533.7*	*533.7 x 0.22 = 117.414 (£million)*
Total EU sales tax = £117.414 million		

Step 3 – calculate the total sales tax
31.2 + 117.414 = 148.614

***Tip:** notice as long as you check the US sales are over £130 million, you don't actually have to calculate the total because there is no tax on sales over £130 million.*

Thus the correct answer is £149 million

Q5 Which of the following represents the smallest amount?

Product B's change in EU sales between Jan-June and July-Dec
7% of Product D's US sales (Jan-June)
Product E's change in US sales between Jan-June and July-Dec
Average US Product A sales per month (July-Dec)
Average US Product C sales per month (Jan-June)

Calculate each figure as follows;

77.8 – 72.2 = £5.6 million
76.5 x 0.07 = £5.355 million
78.2 – 72.7 = £5.5 million
50.5 / 6 = £8.42 million
60.5 / 6 = 10.08 million

***Tip:** remember to quickly re-scan the question because some people will put down the LARGEST value (E) not the SMALLEST (B).*

Thus the correct answer is 7% of Product D's US sales (Jan-June)

Share	Dividend paid (pence per Company Share)	Previous Day's Company Value* (£million)	Total Number of Company Shares (million)	Current Price Per Share (£)	Previous month's Low (pence)	High (pence)
Relf plc	14	240	80	2.75	241	275
Studt Systems	8	171	55	3	238	352
Tombe	10	840	460	1.85	170	203
Xan Inc.	15	28	12	2.28	218	249
IWE Ltd	5	200	114	1.48	160	178

** Previous Day's Company Value = Previous Day's Price x Issued Company Shares*

Q6 A rights issue brings an additional 10% of Studt Systems shares to the market. If the current price drops by 8%, what is Studt Systems's new company value (to the nearest £million)?

£166 million **£167 million** £16.6 million £1,670,000 £169 million

Step 1 – Calculate the new number of company shares
55 x 110% = 60.5 million shares

Step 2 – Calculate the new price
300 x 92% = £2.76

Step 3 – Calculate the Company Value
£2.76 x 60.5 million = £166.98 million = £167 million (to the nearest million)

So the correct answer is £167 million

Q7 If you sold 150,000 Studt Systems shares and collected the dividend, how many Tombe shares could you buy with the proceeds (to the nearest 10,000)?

290,000 280,000 270,000 260,000 **250,000**

Step 1 – Calculate the Company Share value including the dividend
150,000 x (3.00 + 0.08) = £462,000

Step 2 – Calculate the number of Tombe shares
462,000/1.85 = 249,730

So the correct answer is 250,000

Q8 Which share has changed in price by the largest amount since the previous day?

Relf plc Studt Systems Xan Inc **IWE Ltd** Cannot Say

Step 1 – Calculate the Previous Day's Price for each share listed as an answer option.
Previous Day's Price = Previous Day's Company Value / Total number of Company Shares.

Relf plc= 240 / 80 = £3.00
Studt Systems = 171 / 55 = £3.11
Xan Inc. = 28 / 12 = £2.33
IWE Ltd = 200 / 114 = £1.75

Step 2 – Calculate the difference with the Current price for each share, as follows;
Relf plc = 3.00 - 2.75 = 0.25
Studt Systems = 3.11 – 3.00 = 0.11
Xan Inc. = 2.33 - 2.28 = 0.05
IWE Ltd = 1.75 - 1.48 = 0.27

So the correct answer is IWE Ltd

Q9 A day trader bought 50,000 Tombe shares at last month's low, received the Tombe dividend and then sold all these shares at last month's high. What was the approximate percentage gain or loss?

25.3%profit 19.4%profit 25.3% loss 20.5%loss 20.5% profit

Step 1 – Calculate the cost to buy the shares
50,000 x £1.70 = £85,000

Step 2 – Calculate the profit from the change in share price
£2.03 x 50,000 = £101,500
£101,500 - £85,000 = £16,500

Step 3 – add the dividend
£16,500 + (0.10 x 50,000) = £21,500

Step 4 – calculate the %
21,500/85,000 = 25.3%

***Tip:** notice that one of the multiple choice options is the answer if you forgot to add the dividend (19.4% profit). This is called a distractor.*

So the correct answer is 25.3% profit

Q10 A trader has £185,000 to invest and decides to invest this money equally across the 5 shares shown. How many Tombe and IWE Ltd shares does the trader purchase?

2,000 Tombe shares; 2,250 IWE Ltd shares
20,000 Tombe shares; 225 IWE Ltd shares
20,000 Tombe shares; 25,000 IWE Ltd shares
2,000 Tombe shares; 225,000 IWE Ltd shares
None of these

Step 1 – Calculate the amount invested per share
£185,000/5 = £37,000

Step 2 – Calculate the number of Tombe shares
37,000/1.85 =20,000

Step 3 – Calculate the number of IWE Ltd shares
37 000/1.48 = 25,000

So the correct answer is 20,000 Tombe shares; 25,000 IWE Ltd shares

	Number of new mobile phone packages sold *(over the previous 12 months)*			
IK-Connections Ltd	Platinum package	Gold package	Silver package	Bronze package
Central Region stores	4,540	4,854	5,083	5,425
Northern Region stores	4,725	5,005	5,382	5,846
Southern Region stores	4,584	5,123	5,759	5,428
Western Region stores	4,682	4,759	4,956	4,869
Eastern Region stores	4,884	5,256	4,982	4,592
Cost of package *(per month)*	£40	£35	£30	£25

Q11 Which regional store sold the second highest number of new mobile phone contracts for the Platinum and Gold packages combined (over the previous 12 months)?

Central **Northern** Southern Eastern Western

Calculate the combined Platinum and Gold packages for each of IK-Connections Ltd's regional stores:

Platinum package	*Gold package*	*Total*
4,540	*4,854*	*9,394*
4,725	*5,005*	***9,730***
4,584	*5,123*	*9,707*
4,884	*5,256*	*10,140*

So the correct answer is Northern

Q12 What is the difference in revenue between the package with the lowest number of sales and the package with the highest number of sales over the 12 month period, across all regions combined?

£152,000 £101,750 £15,400 £5,747 Cannot Say

Step 1 – find the highest selling and the lowest selling number of new mobile phone contracts by totaling sales across all 5 regional stores for each package

	Platinum package	*Gold package*	*Silver package*	*Bronze package*
Central	*4,540*	*4,854*	*5,083*	*5,425*
Northern	*4,725*	*5,005*	*5,382*	*5,846*
Southern	*4,584*	*5,123*	*5,759*	*5,428*
Western	*4,682*	*4,759*	*4,956*	*4,869*
Eastern	*4,884*	*5,256*	*4,982*	*4,592*
TOTAL	***23,415***	***24,997***	***26,162***	***26,160***

Step 2 – calculate the difference in sale values between the Silver and Platinum packages
Silver package = 26,162 x £30 = £784,860
Platinum package = 23,415 x £40 = £936,600
Difference = £936,600 - £784,860 = £151,740

So the correct answer is £152,000

Q13 What is the difference in average monthly sale values between the most and the least expensive packages?

£1,850 £2,745 £23,550 £27,450 £180,150

Step 1 – the table shows the most (£40 per month) and least expensive packages (£25 per month)

Step 2 – calculate the difference in monthly average monthly packages sold

	Platinum package	*Bronze package*
Central	*4,540*	*5,425*
Northern	*4,725*	*5,846*
Southern	*4,584*	*5,428*
Western	*4,682*	*4,869*
Eastern	*4,884*	*4,592*
ANNUAL TOTAL	***23,415***	***26,160***
MONTHLY AVERAGE	***1951.25***	***2180***
VALUE	***1951.25 x £40 = £78,050***	***2180 x £25 = £54,500***

Difference = £78,050 - £54,500 = £23,550

So the correct answer is £23,550

Q14 Assuming the only costs are those of the monthly package, what was the annual cost saving for a customer who switched from the Gold to the Bronze package?

£10 £50 £75 **£120** £180

This is a relatively easy one.

Step 1 – calculate the monthly difference
£35 - £25 = £10

Step 2 – calculate the annual difference
£10 x 12 = £120

So the correct answer is £120

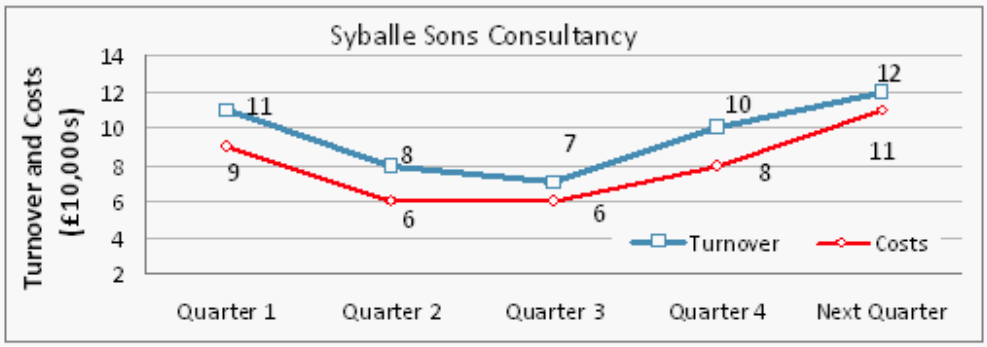
Q15 Over the next twelve months the number of Bronze package sales increases by 12.5% and 25% for the Eastern and Southern regional stores respectively, whilst other sales remain the same. What are the total Bronze package sales for the next twelve months across all IK-Connections stores?

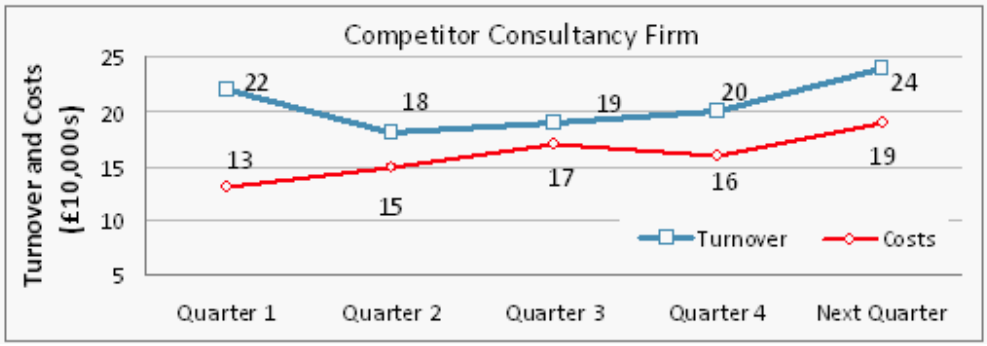
28,091 28,951 30,091 31,951 30,020

Step 1 – calculate the increase for the Eastern and Southern regional stores, then add the number of packages sold for the other 3 regional stores, as shown below;

	Original Bronze package	*Increase*	*New Value*
Central			*5,425*
Northern			*5,846*
Southern	*5,428*	*5,428 x 125% = 6,785*	*6,785*
Western			*4,869*
Eastern	*4,592*	*4,592 x 112.5% = 5,166*	*5,166*
			Total = 28,091

So the correct answer is 28,091





Q16 What is the average quarterly turnover for Syballe Sons compared to the Competitor Consultancy Firm across Quarters 1-4?

£90,000 Syballe Sons; £197,500 Competitor Consultancy Firm
£96,000 Syballe Sons; £200,000 Competitor Consultancy Firm
£90,000 Syballe Sons; £25,750 Competitor Consultancy Firm
£90,000 Syballe Sons; £19,750 Competitor Consultancy Firm
£96,000 Syballe & Sons; £20,000 Competitor Consultancy Firm

Step 1 – Calculate the average turnover for Syballe Sons
(11 + 8 + 7 + 10)/4 = £90,000

Step 1 – Calculate the average turnover for the Competitor Consultancy Firm
(22 + 18 + 19 + 20)/4 = £197,500

So the correct answer is £90,000 Syballe Sons; £197,500 Competitor Consultancy Firm

Q17 Between which two quarters was there the same percentage change in turnover for both Syballe Sons and the Competitor Consultancy Firm?

Quarter 1 – Quarter 2
Quarter 2 – Quarter 3
Quarter 3 – Quarter 4
Quarter 4 – Next Quarter
Cannot Say

Step 1 - Calculate the % change for each quarter for Syballe Sons and the Competitor Consultancy Firm

	% change for each quarter
Quarter 1 – Quarter 2	*(11-8)/11 = 27.3%*
Quarter 2 – Quarter 3	*(8-7)/8 = 12.5%*
Quarter 3 – Quarter 4	*(7-10)/7 = 42.9%*
Quarter 4 – Next Quarter	***(10-12)/10 = 20%***

Step 2 - Calculate the % increase for each quarter for the Competitor Consultancy Firm

Quarter 1 – Quarter 2	*(22-18)/22 = 18.2%*
Quarter 2 – Quarter 3	*(18-19)/18 = 5.6%*
Quarter 3 – Quarter 4	*(19-20)/19 = 5.3%*
Quarter 4 – Next Quarter	***(24-20)/20 = 20%***

Tip: *in practice, the fastest way would be to enter into your calculator 8 ÷ 11 (Syballe's Q1-Q2 turnover), and see if the value on the screen changes when you enter 18 ÷ 22 (Competitor's Q1-Q2 turnover). Repeat for each quarter, and you get to Q4-Next Quarter.*

Hence the correct answer is Quarter 4 – Next Quarter

Q18 The quarter immediately following the period shown will see Syballe Sons' cost and turnover both increase by the same absolute amounts as between Quarter 4 and Next Quarter. What will be the difference between their turnover and costs in that following quarter?

No difference £1,500 £1,000 £500 £2,000

In £10,000s we have:
Step 1 – Turnover increases by 2, costs increase by 3.
Step 2 – Add these to the last data shown in the graph and we have turnover of 2 + 12 = 14 and costs of 3 + 11 = 14.

So the correct answer is No difference

Q19 In the Next Quarter a new competitor enters the market and takes 1/10th of Syballe Sons' turnover, as well as 1/8th of the Competitor Consultancy's turnover. What is the turnover for this new competitor in the Next Quarter?

£14,000 £16,000 **£42,000** £168,000 Cannot Say

Step 1 – add 1/10th of Syballe Sons turnover to 1/8th of their Competitor Consultancy's turnover
(12 x 1/10th) + (24 x 1/8th) = 1.2 + 3 = 4.2

Step 2 – convert to £10,000s

So the correct answer is £42,000

Q20 If Gross Profit is Turnover minus Costs, what was the absolute difference in the Gross Profit between Syballe Sons and the Competitor Consultancy Firm for Quarters 1-4 inclusive?

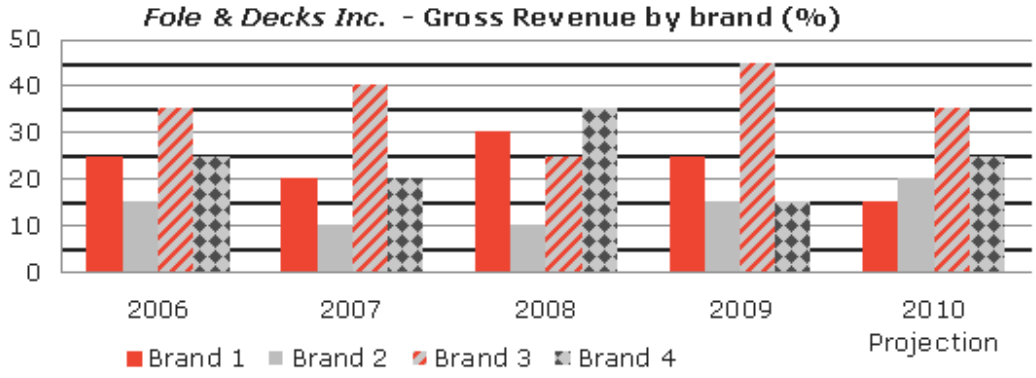
Can't Tell **£110,000** £147,000 £47,000 £11,000

Step 1 – Calculate the Gross Profit for Syballe Sons for Quarters 1-4
(11 + 8 + 7 + 10) – (9 + 6 + 6 + 8) = 7 = £70,000

Step 2 – Calculate the Gross Profit for the Competitor Consultancy Firm
(22 + 18 + 19 + 20) – (13 + 15 + 17 + 16) = 18 = £180,000

Step 3 – calculate the difference
£70,000 - £180,000 = £110,000 less

So the correct answer is £110,000



	Total Gross Revenue * (£million)	Pre-Tax Profit (£million)	Earnings per share (pence)
2006	40	8.5	85
2007	42.7	8.7	104.7
2008	44.4	9	120
2009	50	9.6	120.3
2010	48.7	10.1	119.8

*Total Gross Revenue = Gross Revenue (Brand 1 + Brand 2 + Brand 3 + Brand 4)

Q21 What was Brand 2's gross revenue in 2008?

£10,000,000
£4,440,000
£44,400,000
£9,100,000
£100,000,000

Step 1 – refer to the table to obtain the Total Gross Revenue for 2008 (£44.4 million). Then refer to the graph to obtain the % of this figure that relates to Brand 2

Step 2 – calculate Brand 2's gross revenue in 2008
£44.4 million x 10% = £4.44 million = £4,440,000

So the correct answer is (£4,440,000)

Q22 Which Brand's gross revenue has increased in value by the largest amount between 2006 and 2008?

Brand 1 Brand 2 Brand 3 **Brand 4** Cannot Say

Step 1 - Calculate the Gross Revenue for each Brand in 2007 and 2009. In millions we have:

	Brand 1	*Brand 2*	*Brand 3*	*Brand 4*
2006	*40 x 25% = 10*	*40 x 15% = 6*	*40 x 35% = 14*	*40 x 25% = 10*
2008	*44.4 x 30% =13.32*	*44.4 x 10% = 4.44*	*44.4 x 25% = 11.1*	*44.4 x 35% = 15.54*

Step 2 - Calculate the change in Gross Revenue for each Brand in 2007-2009

	Brand 1	Brand 2	Brand 3	Brand 4
2006-2008	3.32 increase	1.56 decrease	2.9 decrease	5.54 increase

So the correct answer is Brand 4

Q23 If Earnings per share = Pre-tax profit / Number of shares issued, how many shares were issued in 2008 compared to 2006?

2,500,000 less
2,250,000 less
25,000 more
2,500,000 more
250,000 less

Step 1 – calculate the Number of shares issued in 2008
Earnings per share = Pre-tax profit / Number of shares issued
1.2 = 9,000,000 / Number of shares issued
Number of shares issued = 9,000,000 / 1.2 = 7,500,000

Step 2 – calculate the Number of shares issued in 2006
0.85 = 8,500,000 / Number of shares issued
Number of shares issued = 8,500,000 / 0.85 = 10,000,000

Step 3 – Calculate the difference
7,500,000 - 10,000,000 = 2,500,000 less

Thus the correct answer is 2,500,000 less

Q24 For the average annual pre-tax profit (for the years 2007-2009) to equal the average annual pre-tax profit (for the years 2007-2010), what must be the new 2010 Projection?

£895,000 £910,000 £1,150,000 £8,950,000 **£9,100,000**

Step 1 – calculate the average annual Pre-tax profit between 2007-2009
(8.7 + 9.0 + 9.6)/3 = 9.1

Step 2 – create an equation where X = 2010 Projection and the average annual pre-tax profit (2007-2010) = 9.1

Step 3 – 9.1 = (X + 8.7 + 9.0 + 9.6)/4
X = (9.1 x 4) - 8.7 - 9.0 - 9.6 = 9.1 million

So the correct answer is £9,100,000

Q25 In which year was pre-tax profit less than 20% of total gross revenue?

2007 2007 2008 **2009** None of these

Calculate the % of pre-tax profit for each year;

	Total Gross Revenue	*Pre-Tax Profit*	*Pre-Tax profit/total gross revenue*
2006	*40*	*8.5*	*21.25%*
2007	*42.7*	*8.7*	*20.4%*
2008	*44.4*	*9.0*	*20.3%*
2009	*50*	*9.6*	***19.2%***

So the correct answer is 2009

	Average Earnings (Euros per head of the working population)	Male Population (millions)	Female Population (millions)	Working Population (% of total population)
Netherlands	34,000	8.9	9.1	55
Germany	29,000	39.8	40.2	50
France	30,000	31.1	31.4	48
Spain	25,000	24.2	23.8	45
UK	33,000	27.9	28.1	52

Q26 What are the total earnings for the working population in Spain?

54 million Euros
540 billion Euros
540 million Euros
54 billion Euros
Cannot Say

Step 1 – Calculate the total Spanish population by adding the male and female population
24.2 + 23.8 = 48 million

Step 2 - Calculate the total working Spanish population
48 million x 45% = 21.6 million

Step 3 – Calculate the total earnings for the working population in Spain
Average Earnings (Euros per head of the population) = 25,000
25,000 x 21.6 million = 540 billion Euros

So the correct answer is £540 billion Euros

Q27 If the annual birth rates for Germany and Spain are 5.4 births (per 500 population) and 6.4 births (per 500 population) respectively, what is the difference between the number of Spanish and German babies born each year?

24,960 more Spanish babies
100,000 more German babies
249,600 more German babies
1,233,000 more Spanish babies
123,300 less Spanish babies

Step 1 – Calculate the number of German births per year
39.8 + 40.2 = 80 million
5.4 x 80 million /500 = 864,000

Step 2 – Calculate the number of Spanish births per year
24.2 + 23.8 = 48 million
6.4 x 48 million /500 = 614,400

Step 3 – Calculate the difference
864,000 - 614,400 = 249,600

So the correct answer is (C) 249,600 more German babies

Q28 Which of the following countries has a non-working population that is closest in number to the UK's non-working population?

Netherlands Germany France **Spain** Cannot Say

Calculate the populations for each country by adding the male and female population. Then calculate the non-working population for each country, including the UK, as shown below;

	Total Population (millions)	Non Working Population (% of total population)	
Netherlands	8.9 + 9.1 = 18	100 – 55 = 45%	45% x 18 = 8.1
Germany	39.8 + 40.2 = 80	100 – 50 = 50%	50% x 80 = 40
France	31.1 + 31.4 = 62.5	100 – 48 = 52%	52% x 62.5 = 32.5
Spain	24.2 + 23.8 = 48	100 – 45 = 55%	55% x 48 = 26.4
UK	27.9 +28.1 = 56	100 – 52 = 48%	48% x 56 = 26.88

So the correct answer is Spain

Q29 If the ratio of French unemployed in urban to rural areas is 7:8 and the French unemployment rate is 12% of the working population, how many French unemployed are there in urban areas?

1,050,000 1,332,000 **1,680,000** 2,500,000 373,200

Step 1 – calculate the total population
31.1 + 31.4 = 62.5 million

Step 2 – calculate the working population
62.5 x 48% = 30 million

Step 2 – apply the unemployment rate
30 million x 12% = 3.6 million

Step 3 – apply the urban to rural areas ratio
3.6 million = 7:8
Urban areas unemployed = 3,600,000 x 7/15 = 1,680,000

So the correct answer is 1,680,000

Q30 If the ratio of France:Belgium average earnings per head of working population is 2:5, then what is Belgium's average earnings in £, at an exchange rate of 1.15 Euros to the £ (to the nearest £100)?

£124,000 £86,000 £86,300 £124,800 **£65,200**

Step 1 – apply the ratio
30,000: Belgian average earnings = 2:5
Belgian average earnings = (5 x 30,000)/2 = €75,000.

Step 2 – convert into £
75,000 ÷ 1.15 = 65,217.4 = £65,200 (to the nearest £100)

Thus the correct answer is £65,200