Numerical Reasoning
Practice Test 11

Solution Booklet

Last updated: 20-09-2011

	Number of Employees				
Parent Company's 5 subsidiary companies	2005	2006	2007	2008	2009
Subsidiary 1	1,538	1,584	1,573	1,585	1,614
Subsidiary 2	1,107	1,084	1,060	1,068	962
Subsidiary 3	1,340	1,384	1,393	1,398	1,412
Subsidiary 4	1,505	1,495	1,528	1,548	1,583
Subsidiary 5	1,010	980	946	997	1,029
Parent company: Employees working part-time (%)	12.0	8.1	8.0	5.4	5.0

Note: the entire workforce of the parent company comprises only the employees of its five subsidiary companies

Q1 Between which three years was there an average of 1,553 employees for one of the Subsidiary Companies?

(A) 2005-2007 Subsidiary 1
(B) 2006-2008 Subsidiary 1
(C) 2007-2009 Subsidiary 4
(D) 2007-2009 subsidiary 1
(E) None of these

Step 1 – looking at the employee totals there are only two Subsidiary Companies that could have an average of 1,553 employees across three years: Subsidiary Companies 1 and 4. The answer options include Subsidiary Companies 1 and 4, as well as (E) None of these.

Step 2; calculate the average number of employees for answer options (A) – (D)
2005-2007 Subsidiary 1 = 1,565
2006-2008 Subsidiary 1 = 1,581
2007-2009 Subsidiary 4 = 1,553
2007-2009 Subsidiary 1 = 1,591

So the correct answer is (C) 2007-2009 Subsidiary 4

Q2 In 2008 subsidiary company 4 comprised 2 regions with double the number of employees in one region compared to the other. If the ratio of male:female employees in the smaller region was 1:1.15, what was this region's number of male employees?

(A) 240
(B) 828
(C) 414
(D) 394
(E) 360

Step 1 – calculate the number of employees in the smaller region
1,548/3= 516 employees

Step 2 – apply the 1:1.15 Male:Female ratio
516/2.15 = 240 male employees

So the correct answer is (A) 240

Q3 1 in 15 of the parent company's part-time employees were managers in 2005, and 1 in 13 part-time employees were managers in 2007. What was the difference in the number of part-time managers in 2005 compared to 2007?

(A) 14 less
(B) 12 more
(C) 12 less
(D) 13 more
(E) Cannot Say

	2005	*2007*
	1,538	*1,573*
	1,107	*1,060*
	1,340	*1,393*
	1,505	*1,528*
	1,010	*946*
Step 1 – Total employees for each year =	*6,500*	*6,500*
Step 2 – Part-time employees =	*6,500 x 12% = 780*	*6,500 x 8% = 520*
Step 3 – Managers =	*780 / 15 = 52*	*520 / 13 = 40*
Step 3 – Difference = 52 – 40 = 12		

So the correct answer is (B) 12 more

Q4 What % of the Parent Company's total employees worked for Subsidiary 5 in 2006 (to the nearest whole %)?

(A) 12%
(B) 10%
(C) 18%
(D) 15%
(E) 9%

Step 1 - Calculate the total number of employees across all 5 Subsidiaries i.e. the Parent Company's number of employees = 6,527

Step 2 – Calculate the % of Subsidiary 5 employees
980/6527 = 15.01%

So the correct answer is (D) 15%

Q5 In 2009 what was the absolute difference between the Parent Company's full-time employees and part-time employees (if Number of employees = Full-time employees + part-time employees)?

(A) 6,270
(B) 90
(C) 4,733
(D) 6,600
(E) 5,940

Step 1 – calculate the total employees in 2009
1,614 + 962 + 1,412 + 1,583 + 1,029 = 6,600

Step 2 – calculate the number of full-time employees
Number of employees = Full-time employees + part-time employees
6,600 = 100% = x% + 5%
Full-time employees = 95%

Step 3 – calculate the difference in the % of part-time employees to full-time employees
95% - 5% = 90%

Step 4 – calculate the difference
6,600 x 90% = 5,940

So the correct answer is (E) 5,940

Laptop model	COSTS		UK Price (£)	Ratio of sale price: normal price
	Manufacturing cost (£)	Design cost (£)		
Adelphi	165	60	400	1:2
Adele	140	90	350	3:4
Faze	120	60	380	2:5
Stunn	145	115	420	1:2
Brete	195	130	650	2:3

Q6 For which laptop, or laptops, is the difference between the manufacturing cost and the design cost less than 20% of the manufacturing cost?

(A) Brete
(B) Stunn and Adelphi
(C) Adelphi
(D) Stunn
(E) None of these

Calculate the % difference between the manufacturing cost and the design cost (relative to manufacturing cost) for each laptop as shown below;

Faze	*(120 - 60)/120 = 50%*
Brete	*(195 - 130)/195 = 33%*
Adele	*(140 - 90)/140 = 36%*
Stunn	*(145 - 115)/145 = 21%*
Adelphi	*(165 - 60)/165 = 64%*

So the correct answer is (E) None of these

Q7 Put the laptop models in order of increasing mark-up (Mark-up = Price – Costs).

(A) Adele, Adelphi, Stunn, Faze, Brete
(B) Adele, Stunn, Brete, Adelphi, Faze
(C) Adele, Stunn, Adelphi, Faze, Brete
(D) Stunn, Adele, Adelphi, Brete, Faze
(E) Adele, Stunn, Adelphi, Brete, Faze

Step 1 – for each laptop model calculate the total costs, then deduct this from the price, as shown below;

	Total Cost	***Mark-up***
Adelphi	*165 + 60 = 225*	*400 – 225 = 175*
Adele	*140 + 90 = 230*	*350 – 230 = 120*
Faze	*120 + 60 = 180*	*380 – 180 = 200*
Stunn	*145 + 115 = 260*	*420 – 260 = 160*
Brete	*195 + 130 = 325*	*650 – 325 = 325*

Thus the correct Answer is (C) Adele, Stunn, Adelphi, Faze, Brete

Q8 If the same number of each model was sold last month and total sales were £220,000, how many of each model were sold?

(A) 200
(B) 2510
(C) 100
(D) 2150
(E) Cannot Say

Step 1 – Calculate the total sales value of one of each type of laptop
400 + 350 + 380 + 420 + 650 = 2200

Step 2 – Divide total monthly sales by this number
220,000/2200 = 100

Thus the correct answer is (C) 100

Q9 Which of the following would generate the highest total amount at the sale prices shown?

(A) 75 Adele laptops on sale
(B) 150 Adele laptops at a further 60% reduction to the sales price
(C) 50 Faze and 50 Stunn laptops on sale
(D) 45 Brete laptops on sale
(E) 90 Stunn laptops on sale

Step 1 – calculate the sales price for the 4 laptops that are listed as possible answer options, using the column headed Ratio of sales price : normal price;

	Sales Price (£)
Adele	*= 350 x 3/4 = 262.5*
Faze	*= 380 x 2/5 = 152*
Stunn	*= 420 x 1/2 = 210*
Brete	*= 650 x 2/3 = 433.33*

Step 2 – go through answer options (A)-(E) calculating the total amount

(A) 75 Adele laptops = 75 x 262.5 = £19,687.50
(B) 150 Adele laptops at a price further reduced by 60% = 40% x 150 x 262.5 = £15,750
(C) 50 Faze and 50 Stunn laptops = 50 x (152 + 210) = £18,100
(D) 45 Brete laptops = 45 x 433.33 = £19,499.85
(E) 90 Stunn laptops = 90 x 210 = £18,900.00

So the correct answer is (A) 75 Adele laptops

Q10 If the sales price for a Faze laptop is $182.40 in the United States and 255.36 Euros in France, what is the sales price ratio for the UK:US:France? (Use exchange rates of 1.2 Euros to the £; and 1.5$ to the £).

(A) 152:121:212
(B) 7:6:9
(C) 5:4:7
(D) 4:5:7
(E) 152:122:213

Step 1 – use the exchange rates to calculate the sales prices in the US and in France
US sales price = $182.40 /1.5 = £121.6
French sales price = 255.36 /1.2 = £212.8

Step 2 – the Faze sales price in the UK is 2/5 x £380. We now obtain a ratio
UK; US; France = 152:121.6:212.8

Step 3 – simplify the ratio by dividing by the highest common denominator
152/30.4 : 121.6/30.4 : 212.8/30.4 = 5:4:7

So the correct answer is (C) 5:4:7

2010 Monthly Average	Total Searchers (1000s)	Total Searches (millions)	% of Total Searchers	
			Selling goods/services	Buying goods/services
Australia	19,613	2,412	10	32
Ireland	1,146	170	3	28
UK	31,225	3,975	12	22
Italy	14,850	1,855	6	8
Sweden	16,204	9,578	21	42

Goods/services bought online (% for June 2010)	Household goods	Films/ music	Financial products	Tickets	Holidays
Australia	9	12	3	17	22
Ireland	3	9	2	10	18
UK	13	10	2	9	15
Italy	9	8	3	8	9
Sweden	5	2	1	3	4

Q11 In which country was there the second highest number of Searchers buying goods/services online?

(A) Australia
(B) Ireland
(C) UK
(D) Italy
(E) Sweden

The first table shows the % of Searchers buying goods/services, as well as the number of Internet searchers. Use these columns to find the total number of searchers per country, as follows;

	(1000's)
Australia	*32% x 19,613 = 6,276.16*
Ireland	*28% x 1,146 = 320.88*
UK	*22% x 31,225 = 6,869.50*
Italy	*8% x 14,850 = 1,188*
Sweden	***42% x 16,204 = 6,805.68***

Thus the correct answer is (E) Sweden

Q12 In which country was there the second lowest number of Searchers selling goods/services online?

(A) Australia
(B) Ireland
(C) UK
(D) Italy
(E) Sweden

The first table shows the % of Searchers selling goods/services, as well as the number of Internet searchers. Use these columns to find the total number of searchers per country – whilst ensuring that - unlike the previous question – you provide the second lowest number of Searchers.

	(1000's)
Australia	*10% x 19,613 = 1,961.30*
Ireland	*3% x 1,146 = 34.38*
UK	*12% x 31,225 = 3,747.00*
Italy	***6% x 14,850 = 891.00***
Sweden	*21% x 16,204 = 3,402.84*

Thus the correct answer is (D) Italy

Q13 If each UK Internet Searcher spends £1.50 on average per month when buying goods/services online, what is the annual spend of all UK Internet Searchers (to the nearest £million)?

(A) £125 million
(B) £10 million
(C) £56 million
(D) £124 million
(E) £12.3 million

Tip: Remember to multiply the number of Searchers by the percent who actually buy goods/services. The key phrase is "when buying goods/services".

Step 1 – calculate the number of UK Internet searchers buying goods/services online in June

UK's Internet Searchers	% of searchers Buying goods/services	
31,225,000	22	31,225,000 x 22% = 6,869,500

Step 2 – calculate the annual spend
£1.50 x 6,869,500 x 12 = £123,651,000 = £124 million

So the correct answer is (D) £124 million

Q14 If three countries *I.U.I.* (Ireland, UK, Italy) are grouped together and the other two countries *S.A.* (Sweden, Australia) are grouped together, what is the difference between the average number of Internet searches per *I.U.I.* country and the average number of Internet searches per *S.A.* country?

(A) None of these
(B) 2,000 million
(C) 3,995 million
(D) 6,000 million
(E) 1,500 million

Step 1 – Calculate the I.U.I. countries number of Internet searches
170 + 3,975 + 1,855 = 6,000

Step 2 – Calculate the number of Internet searches for the S.A. countries
2,412 + 9,578 = 11,990

Step 3 – Calculate the averages
I.U.I. = 6,000 / 3 = 2,000
S.A. = 11,990 / 2 = 5,995

Step 4 – Calculate the difference between the averages
5,995 – 2,000 = 3,995

Thus the correct answer is (C) 3,995 million

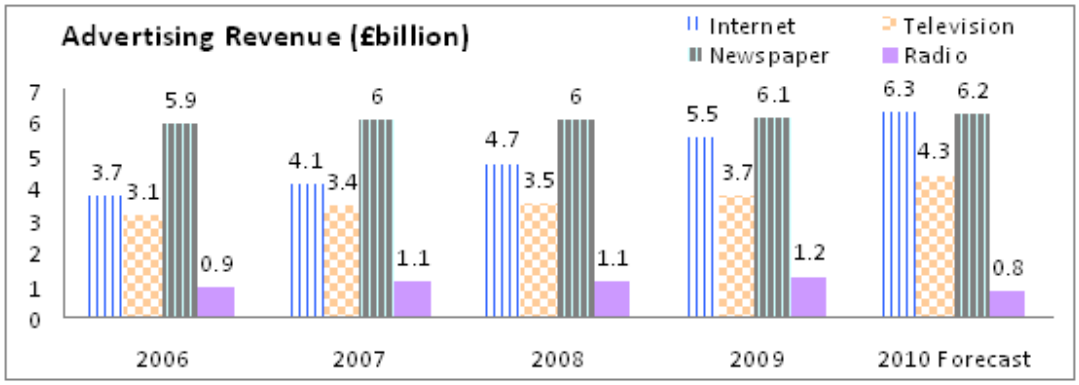
Q15 Which country has the lowest average number of Internet searches per Internet searcher?

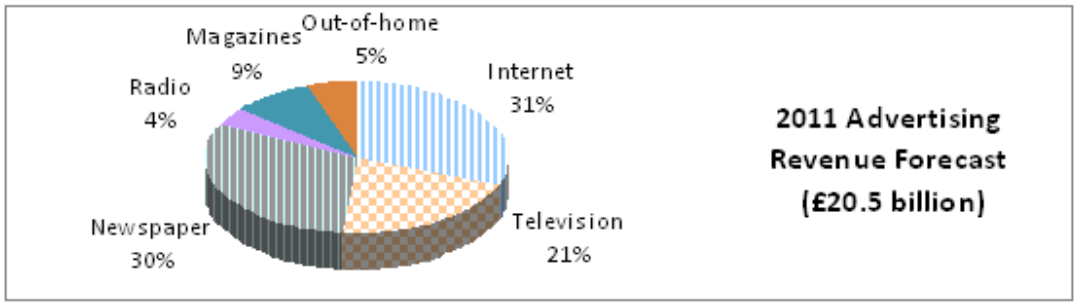
(A) Australia
(B) Ireland
(C) UK
(D) Italy
(E) Sweden

Calculate the average number of Internet searches per Internet searcher for each of the countries, as follows;

	Internet Searchers (1000s)	*Internet Searches (millions)*	*Average number of searches per searcher (1000)*
Australia	*19,613*	*2,412*	***2,412,000/19,613 = 122.98***
Ireland	*1,146*	*170*	*170,000/1,146 = 148.3*
UK	*31,225*	*3,975*	*3,975,000/31,225 = 127.3*
Italy	*14,850*	*1,855*	*1,855,000/14,850 = 124.92*
Sweden	*16,204*	*9,578*	*9,578,000/16,204 = 591.09*

So the correct answer is (A) Australia





Q16 Which of the following two media are predicted together to generate £6.15 billion of advertising revenue in 2011?

(A) Television and Radio
(B) Newspaper and Radio
(C) Out-of-home and Newspaper
(D) Radio and Magazines
(E) Magazines and Television

Step 1 - Calculate the 2011 advertising revenue using the pie-chart data, look for the combinations which add up to 6.15

Television	***21% x £20.5 billion = 4.305***
Newspaper	*30% x £20.5 billion = 6.15*
Out-of-home	*5% x £20.5 billion = 1.025*
Radio	*4% x £20.5 billion = 0.82*
Magazines	***9% x £20.5 billion = 1.845***

So the correct answer is (E) Magazines and Television

Q17 If the Internet advertising forecast for 2011 is expected to split into mobile: display advertising in a 1:4 ratio, what is the mobile forecast?

(A) £20.5 billion
(B) £1.55 billion
(C) £1.27 billion
(D) £31.00 billion
(E) £7.75 billion

The information that you need is shown in the pie-chart
Step 1 – calculate the Internet advertising forecast for 2011
31% x £20.5 billion = £6.355 billion

Step 2 – apply the ratio
1:4, so mobile = 1/5th of £6.335 billion = £1.27 billion

So the correct answer is (C) £1.27 billion

Q18 If the same absolute trends in advertising revenue from 2009 to 2010 continue for 2010 to 2011, then what will be the 2011 advertising revenue for Television and Internet combined?

(A) £8.1 billion
(B) £16.2 billion
(C) £21.2 billion
(D) £12 billion
(E) £10.6 billion

Step 1 – calculate the 2009-2010 change in Television and Internet combined
Television: 4.3 – 3.7 = 0.6 increase
Internet: 6.3 – 5.5 = 0.8 increase
Television and Internet combined = 1.4 increase

Step 2 – apply the same change to the 2010 total for Television and Internet combined
6.3 + 4.3 +1.4 = 12

Thus the correct answer is (D) £12 billion

Q19 In which year, or years, was Television advertising revenue less than 22.5% of the year's total advertising revenue?

(A) Cannot Say
(B) 2008 and 2006
(C) 2006
(D) 2009 and 2008
(E) 2009

Calculate Television's % of the total revenue for each of the four years given as answer options;

	Television Revenue	*Total Revenue*	*% of total revenue*
2006	*3.1*	*13.6*	*22.8*
2007	*3.4*	*14.6*	*23.3*
2008	*3.5*	*15.3*	*22.9*
2009	*3.7*	*16.5*	*22.4*

So the correct answer is (E) 2009

Q20 If in 2009 an external market force had reduced the year's advertising revenue from Newspapers by 10% and from the Internet by 20%, then what was the total 2009 advertising revenue?

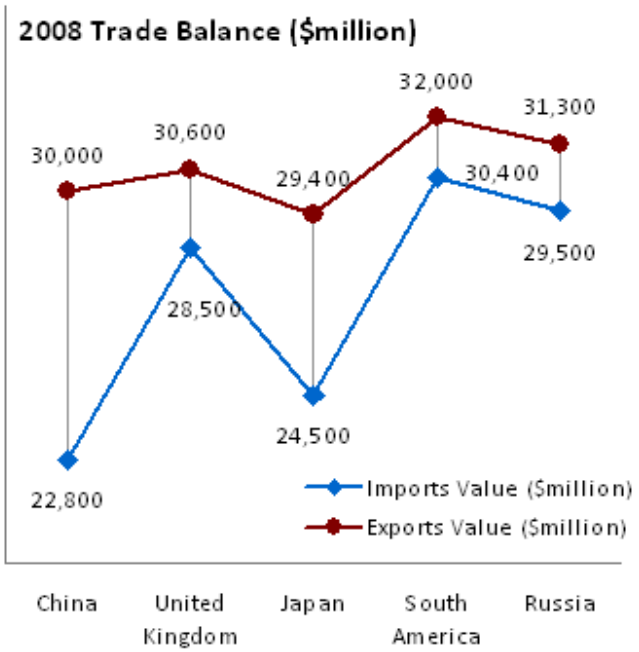
(A) None of these
(B) £9.89 billion
(C) £11.6 billion
(D) £10.44 billion
(E) £14.79 billion

Step 1 – calculate the adjusted Newspaper revenue
6.1 x 90% = 5.49

Step 2 – calculate the adjusted Internet revenue
5.5 x 80% = 4.4

Step 3 – calculate the adjusted total 2009 advertising revenue
5.49 + 4.4 + 3.7 (television) + 1.2 (radio) = 14.79

So the correct answer is (E) £14.79 billion



2009 Trade Balance*	
	Value ($ million)
China	18,400
United Kingdom	1,825
Japan	5,840
South America	1,950
Russia	1,200

* Trade balance = (Exports Value) – (Imports Value)

Q21 Of the regions shown what was the difference between the highest and the lowest trade balance in 2008?

(A) None of these
(B) $5,100 million
(C) $510 million
(D) $5,400 million
(E) $5,600 million

Step 1 - Use the graph (i.e. 2008 figures) to calculate the trading balance (exports – imports) for each region

	Exports – imports ($million)
China	*30,000 – 22,800 = 7,200*
United Kingdom	*30,600 – 28,500 = 2,100*
Japan	*29,400 – 24,500 = 4,900*
South America	*32,000 – 30,400 = 1,600*
Russia	*31,300 – 29,500 = 1,800*

Step 2 – calculate the difference between the highest and the lowest trading balance
7,200 – 1,600 = $5,600 million

So the correct answer is (E) $5,600 million

Q22 If Japan's exports value increased by 1/5th between 2008 to 2009 then what was Japan's imports value in 2009?

(A) Cannot Say
(B) $29,400 million
(C) $23,560 million
(D) $25,560 million
(E) $29,440 million

Step 1- Use the graph to obtain the 2008 exports value = 29,400

Step 2 – Add 1/5th to find the 2009 exports value
29,400 x 1.2 = 35,280

Step 3 - Use the table to obtain the 2009 trade balance = 5,840
Japan's imports value in 2009 = 35,280 – 5,840 = $29,440 million

Thus the correct answer is (E) $29,440 million

Q23 Compared to 2009, the UK's trade balance is expected to increase by 3.5% in 2010 and China's trading balance is expected to decrease by 4.4%. What is the difference between the 2010 trade balance forecasts for these countries (to the nearest $million)?

(A) $14,405 million
(B) $15,000 million
(C) $16,000 million
(D) **$15,702 million**
(E) $17,000 million

Step 1 – calculate the increase for the UK and the decrease for China
UK: 103.5% x 1,825 = 1,888.875
China: 95.6% x 18,400 = 17,590.4

Step 2 – calculate the difference
17,590.4 - 1,888.875 = $15,701.525 (million $)

***Tip:** these numbers are already in million $, so don't be tempted to round the answer to (C) $16,000 million.*

So the correct answer is (C) $15,702 million

Q24 Which region or regions have experienced a decrease in their trade balance between 2008 and 2009?

(A) South America, United Kingdom
(B) United Kingdom, Russia
(C) South America, Russia
(D) South America
(E) Russia

Using the trade balance figures for 2008 from the earlier question, calculate the change in trade balances for each region between 2008 and 2009

China	*18,400 – 7,200 = 11,200 increase*
United Kingdom	***1,825 – 2,100 = 275 decrease***
Japan	*5,840 – 4,900 = 940 increase*
South America	*1,950 – 1,600 = 350 increase*
Russia	***1,200 – 1,800 = 600 decrease***

So the correct answer is (B) United Kingdom, Russia

Q25 What is the trading balance range (highest minus lowest) for the five regions between 2008-2009?

(A) $1,200 million – $18,400 million
(B) $5,400 million
(C) $17,200 million
(D) $1,600 million – $18,400 million
(E) $1,800 million – $7,200 million

To save time you can use the trading balance figures for 2008 from the earlier question. Then calculate the range across both years.

	2008 ($million)	*2009 ($million)*
China	*7,200*	***18,400***
United Kingdom	*2,100*	*1,825*
Japan	*4,900*	*5,840*
South America	*1,600*	*1,950*
Russia	*1,800*	***1,200***

The lowest and the highest values are 1,200 and 18,400 respectively.

Tip: *remember the question defined the 'range' as highest minus lowest, as is often convention in finance and accounting professions. Answering with the highest and lowest numbers is not what the question asked for.*

So the correct answer is (C) $17,200 million

	Annual Birth rate (per 1000 of total population)	Annual births		Annual birth rate for sets of twins (as a % of annual births)
		Male	Female	
COUNTRY				
Scotland	12.2	28,693	27,086	1.6
Northern Ireland	14.8	13,515	12,934	1.9
Wales	12.5	18,640	16,800	1.25
REGION				
Inner London	16.4	24,735	23,461	1.7
Outer London	15.1	35,811	34,189	2
South West	12	30,258	28,747	1.8
South East	12.3	53,141	50,099	1.8
East	12.1	34,745	32,564	2

Q26 If the number of annual births are distributed evenly across the year and they remain constant at the levels shown, then how many months will it take for Outer London's population to increase by 245,000?

(A) 34
(B) 36
(C) 38
(D) 40
(E) 42

Step 1 – calculate the total annual births
35,811 + 34,189 = 70,000

Step 2 – calculate the number of years and months required to reach 245,000
245,000 / 70,000 = 3.5 years = 42 months

Thus the correct answer is (E) 42

Q27 Which country or countries shown have a population of less than 2.9 million people?

(A) Wales, Scotland
(B) Northern Ireland, Wales, Scotland
(C) Scotland
(**D) Northern Ireland, Wales**
(E) Cannot Say

A country's population can be calculated using the Annual Birth rate - which is given per 1000 of total population – and the number of live births that when combined make up the annual birth rate.

	Annual Birth rate (per 1000 of total population)	*Number of births*	*Population*
Scotland	*12.2*	*28,693 + 27,086 = 55,779*	*1000 x 55,779/12.2 = 4,572,049.1*
Northern Ireland	*14.8*	*13,515 + 12,934 = 26,449*	*1000 x 26,449/14.8 = 1,787,094.5*
Wales	*12.5*	*18,640 + 16,800 = 35,440*	*1000 x 35,440/12.5 = 2,835,200*

So the correct answer is (D) Northern Ireland, Wales

Q28 What is the population of Inner and Outer London combined (to the nearest 100,000)?

(A) 8,000,000
(B) 4,600,000
(C) 3,000,000
(D) 7,600,000
(E) None of these

	Annual Birth rate (per 1000 of total population)	*Number of births*	*Population*
Inner London	*16.4*	*24,735 + 23,461 = 48,196*	*1000 x 48,196/16.4 = 2,938,780.4*
Outer London	*15.1*	*35,811 + 34,189 = 70,000*	*1000 x 70,000/15.1 = 4,635,761.5*

Inner and Outer London population = 2,938,780.4 + 4,635,761.5 = 7,574,541.9

Thus the correct answer is (D) 7,600,000

Q29 How many babies are born on average as twin births in Wales over five years?

(A) 4,430
(B) 886
(C) 2,215
(D) 443
(E) Cannot Say

Step 1 – calculate the total number of births in Wales
18,640 + 16,800 = 35,440

Step 2 – calculate the annual number of twin births
35,440 x 1.25% = 443

Step 3 – number of babies over 5 years
443 x 2 x 5 = 4,430

So the correct answer is (A) 4,430

Q30 What percent of births are male across the 5 Regions shown?

(A) 49.5%
(B) 50%
(C) 50.5%
(D) 51%
(E) 51.4%

Step 1 – calculate the total number of male births
24,735 + 35,811 +30,258 + 53,141 + 34,745 = 178,690

Step 2 – calculate the total births
178690 + 23,461 + 34,189 + 28,747 + 50,099 + 32,564 = 347,750

Step 3 – put into a %
100% x (178,690/347,750) = 51.4%

So the correct answer is (E) 51.4%