Bishop Challoner Catholic College

Exam Success in Business Quantitative Skills Guide 2023

Overview

In this guide there will be information on how to access the quantitative skills questions. These questions will involve calculations and interpretation of data. They can be stand-alone questions, but could also be embedded into a long response. There are a number of formulae that you will need to be able to recall, use and apply to different scenarios.

These questions will be across all topics on both papers and will account for 10% of your final score. The questions will always be in a business context.

Calculations

The calculations that you are expected to be able to do are as follows:

- Percentages and percentage changes
- Averages
- Revenue, costs and profit
- Gross profit margin and net profit margin ratios
- Average rate of return
- Cash-flow forecasts, including total costs, total revenue and net cash flow.

You will need to be able to do these in a variety of different business contexts.

Interpretations

Interpretation and use of quantitative data in business contexts to support, inform and justify business decisions, including:

- Information from graphs and charts
- Profitability ratios (gross profit margin and net profit margin)
- Financial data, including profit and loss, average rate of return and
- Cash-flow forecasts
- Marketing data, including market research data
- Market data, including market share, changes in costs and changes in prices.

Formulae Page

The table below shows a list of formulae that you will be examined on at the end of year 11.

Topic	**Formula**
Total Costs	TC (total cost) = TFC (total fixed costs) + TVC (total variable costs)
Revenue	Revenue = price × quantity
Break Even	$Break\ even\ in\ units = \frac{fixed\ costs}{sales\ price - variable\ costs}$ $Break\ even\ in\ revenue\ or\ costs = break\ even\ in\ units\ \times sales\ price$
Margin of Safety	Margin of safety = actual or budgeted sales − break even sales
Interest (on loans)	$Interest\ of\ loans\ (\%) = \frac{total\ repayment - total\ borrowed}{borrowed\ amount} \times 100$
Net Cash Flow	Net cash flow= cash inflows − cash outflows in a given period
Opening and Closing Balances	Opening balance = closing balance of the previous period Closing balance = opening balance + net cash flow
Gross Profit	Gross profit = sales revenue − cost of sales
Gross Profit Margin	$Gross\ profit\ margin(\%) = \frac{gross\ profit}{sales\ revenue} \times 100$
Net Profit	Net profit = gross profit − other operating expenses and interest
Net Profit Margin	$Net\ profit\ margin\ (\%) = \frac{net\ profit}{sales\ revenue} \times 100$
Average Rate of Return	$ARR\ (\%) = \frac{average\ annual\ profit}{cost\ of\ investment} \times 100$
Average Annual Profit	$AAP = \frac{total\ profit}{number\ of\ years}$

Exemplar Calculations

Percentage Comparisons

The Café sells latte for £2.95 for a medium sized mug. When determining the price to be charged, Catherine did some market research.

She looked at the prices charged by their leading competitors:

Starbucks £2.95

Caffé Nero £2.65

Whites Tea Rooms £3.15

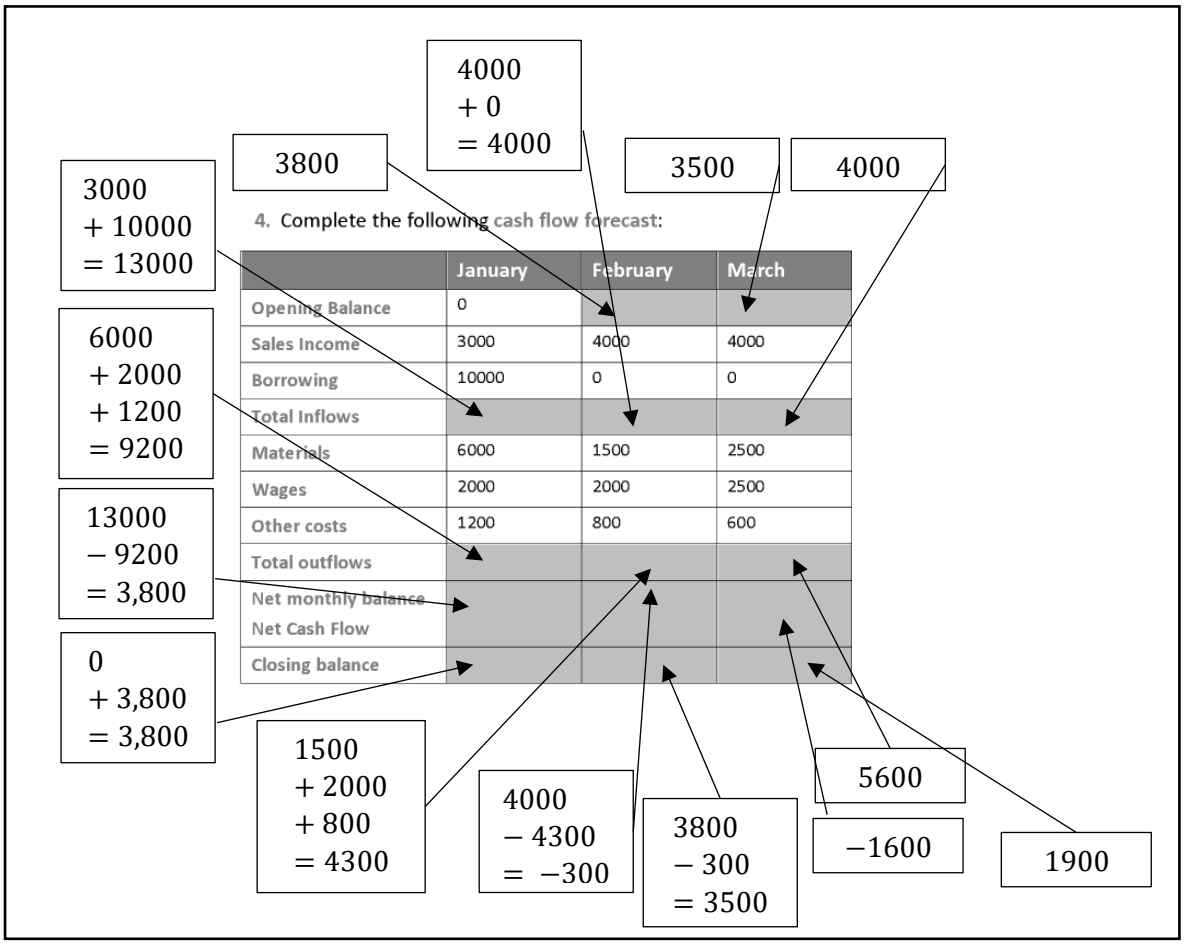
Calculate, in percentage terms, how much more expensive Whites Tea Rooms is compared to Caffe Nero.

£3.15 – £2.65 = £0.50

$\frac{0.50}{2.65} \times 100 = 18.8679 \ldots \%$

18.9% more expensive

Cash Flow



4. Complete the following cash flow forecast:

	January	February	March
Opening Balance	0		
Sales Income	3000	4000	4000
Borrowing	10000	0	0
Total Inflows			
Materials	6000	1500	2500
Wages	2000	2000	2500
Other costs	1200	800	600
Total outflows			
Net monthly balance Net Cash Flow			
Closing balance			

Break Even

"Sweet Dreams" is a small business providing old-fashioned sweets on an artisan stall and is available for wedding and other parties.

The hosts pay for the stall and sweets and then guests can help themselves throughout the party.

Its pricing structure is as follows:

- Fully stocked stall of retro sweets with a "sweet host" for three hours – £350
- Fully stocked stall of retro sweets and one refill, with host for three hours – £390

The average cost of stocking the stall for a three hour party is £35.00 and therefore the refill is another £35.00. Most customers select the refill option and pay £390 for renting the stall.

It is possible for the stall to attend three functions in a day – often on a Saturday. However, it generally will attend two, an afternoon children's party and then an evening function of some kind. Sweet Dreams does not operate on a Monday, as it is a quiet day and the owners use this day to buy stock, undertake paperwork, marketing and general banking. However, in the run up to Christmas and in the summer it can be rented 7 days a week.

The business costs out the wages of the host at £70 per rental

The annual fixed costs to the business of operating "Sweet Dreams" is £54,000. This includes business owners' salaries, marketing, interest payments, security costs, rent and insurance.

Calculate the number of rentals at £390 needed in order to break even

Contribution = Selling Price – VC

VC = 35 + 35 (stocking and then refilling) + 70 (wages) = £140

Selling Price = £390

Contribution = 390 – 140 = £250

$$Break\ Even = \frac{FC}{Contribution}$$

$$Break\ Even = \frac{54000}{250}$$

BE Point = 216 rentals

Margin of Safety

The business attended 550 events in 2016.

. Calculate the margin of safety.

Margin of Safety = Actual/Predicted Output - BE Point

Margin of Safety = 550 – 216

MoS = 334 events

Interest on a Loan

James and Beth Davenport decide to set up a small business selling coffee and other light refreshments from a small mobile van. They forge links with local groups such as "Park Run" to sell their products at meetings and events. Equally, their service is also available to be hired for private gatherings and parties.

As with all businesses, they face both fixed and variable costs.

They estimate that the variable costs of a cup of coffee and tea are 22 pence per unit. The business borrowed £7000 to purchase the second-hand van and modernise it too. This loan is being paid off over 5 years. Annual interest charges are £460, leading to total interest of £2,300.

The price of a cup of coffee and tea is £1.60.

Calculate the total monthly repayment on the loan, assuming that there are 60 equal payments and the total interest charge is split equally over each month.

7000/5 = £1400 per year

1400 + 460 = £1860 per year total

1860/12 = £155 per month

Profit, Costs and Revenue

James and Beth Davenport decide to set up a small business selling coffee and other light refreshments from a small mobile van. They forge links with local groups such as "Park Run" to sell their products at meetings and events. Equally, their service is also available to be hired for private gatherings and parties.

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The price of a cup of coffee and tea is £1.60.

James and Beth cost out their own labour at the minimum wage of £7.20 per hour. Each Saturday morning they work a 4 hour shift when they set up their stall at the local park.

Profit = Revenue - Total Costs

Revenue = Sales x Selling Price

Daily Revenue = 300 x 1.60 = **£480 per morning**

Monthly Revenue= 480 x 4 = £1,920

Fixed Costs = Loan Repayment of £155

Variable Costs = (7.20 x 4) x 4 = £115.20 (Labour per person)

£115.20 x 2 = 330.40

0.22 x 300 = £66 (Costs of making the drinks)

Total Costs = Fixed Costs + Variable Costs

Total Costs = 330.40 + 155 + 66 = **£551.40**

Profit = 1920 – 551.40 = £1368.60

Gross Profit

FR Music is a supplier of various instruments with three shops within the North West of England. Turnover in 2015-2016 was £5.4 million.

The cost of sales was the business in the same time period was £2.3 million.

. Calculate the gross profit that FR Music made during the financial year 2015–2016.

Gross profit = sales revenue − cost of sales

GP = 5400000 – 2300000

GP = 3100000 or **£3.1million**

Gross Profit Margins

FR Music is a supplier of various instruments with three shops within the North West of England. Turnover in 2015-2016 was £5.4 million.

The cost of sales was the business in the same time period was £2.3 million.

Calculate the gross profit margin for FR Music during the financial year 2015–2016.

$$Gross\ profit\ margin(\%) = \frac{gross\ profit}{sales\ revenue} \times 100$$

$$GPM = \frac{3.1}{5.4} \times 100$$

GPM = 57.4%

Average Annual Profit

Shop three is in a relatively low rent cost area of Manchester and has a focus on developing the businesses online sales. It concentrates on sheet music, examination syllabus books and items such as reeds and strings. Many of these items have the potential for high mark-up margins.

FR Music's owners are considering an expansion to the operation in shop three by building a larger warehouse and dispatch area for its online sales.

The investment will be £120,000. The expected annual profits as a result of the investment are £140,000 over 5 years.

. Calculate the average annual profit per year.

$$AAP = \frac{total\ profit}{number\ of\ years}$$

$$APP = \frac{140{,}000}{5}$$

APP = £28,000

Average Rate of Return

Shop three is in a relatively low rent cost area of Manchester and has a focus on developing the businesses online sales. It concentrates on sheet music, examination syllabus books and items such as reeds and strings. Many of these items have the potential for high mark-up margins.

FR Music's owners are considering an expansion to the operation in shop three by building a larger warehouse and dispatch area for its online sales.

The investment will be £120,000. The expected annual profits as a result of the investment are £140,000 over 5 years.

Calculate the average rate of return on the investment.

$$ARR\ (\%) = \frac{average\ annual\ profit}{cost\ of\ investment} \times 100$$

$$ARR\ (\%) = \frac{28{,}000}{120{,}000} \times 100$$

ARR = 23.3333… %

Net Profit Margin

3 Look at this data from Ryanair.

Table 47.4 Revenue and profit at Ryanair

	2015	2016
Sales revenue	£5,654 million	£6,536 million
Net (operating) profit	£1,043 million	£1,460 million

Calculate Ryanair's net profit margin for 2015 and 2016

2015

$$Net\ profit\ margin\ (\%) = \frac{net\ profit}{sales\ revenue} \times 100$$

$$Net\ profit\ margin\ (\%) = \frac{1{,}043\ million}{5{,}654\ million} \times 100$$

NPM = 18.4%

2016

$$Net\ profit\ margin\ (\%) = \frac{1{,}460\ million}{6{,}536\ million} \times 100$$

NPM = 22.3%