



DECEMBER 2016

NUMERACY & STATISTICS

Instructions to candidates:

- a) Time allowed: Three hours (plus an extra ten minutes' reading time at the start – do not write anything during this time)
- b) Answer ALL questions in Part A and any THREE questions in Part B
- c) Part A carries 40% of the marks and Part B carries 60% of the marks
- d) Marks for each question are shown in []
- e) Non-programmable calculators are permitted in this examination

PART A

- 1. 'Strange Rabbit', an alternative clothing store, offer $\frac{1}{2}$ off all items for sale, for ten days only. They offer a further $\frac{1}{3}$ off all clothing which are clearance items. What percentage is deducted in total during the ten-day promotion for clearance items of clothing? [4]
- 2. Susan is a sales adviser for a large electrical goods supplier. She receives a basic salary of £24,750 per year and is also paid commission on sales which averages £130 per week. Her tax allowance is £11,000 for the tax year 2016/2017. The basic rate of tax is 20%.
 - a) Calculate:
 - i her gross pay for the year [4]
 - ii the amount of tax she pays in this tax year [6]
 - iii her net pay for the year [2]
 - b) Susan's employer has introduced an optional company bonus scheme which is ultimately to replace commission on sales in two years' time. The bonus is based on 15% of employees' basic salary. Comment on whether Julia is better off receiving commission or the company bonus scheme. [8]
- 3. Sara is setting up a new business selling smartphones and has £75,000 to invest in capital. She has already spent 55% on buildings and a further 16% on fixtures and fittings. Calculate how much she has left to spend on her stock of smartphones. [4]
- 4. Tear Waves produced the following number of wakeboards over a six-month period:

MONTH	JAN	FEB	MAR	APR	MAY	JUN
NO. OF WAKEBOARDS	1,400	1,700	2,200	2,400	2,500	2,600

 - a) Illustrate the above table as a line graph. [4]
 - b) Calculate the mean number of wakeboards produced. [2]
 - c) Draw a cumulative frequency curve with the above data. [6]

PART B

- 5. Anjum is making a three-dimensional model of a proposed new office development to a scale of 1:100. Next door to the new development is a high steel chimney and various other buildings. In order to show the model in proportion to the existing buildings, Anjum decides to include the chimney in the calculations for the model. To find the chimney's height, Anjum walks 100 metres away from the chimney and notes that the angle of elevation of the top is 25° . The ground is flat, with no inclines.
 - a) Find the height of the chimney. [4]
 - b) Anjum then measures the circumference of the chimney to be 18 metres. Calculate the radius of the chimney. [4]
 - c) If the thickness of the steel is 20cms, find:
 - i the internal diameter of the chimney
 - ii the internal volume of the chimney
 - iii the volume of steel in the chimney [12]

6. The quantities of assemblies produced by Bretts Ltd during the year ended 31 December 2015 and the related total production costs are as below:

Month	Production 000s	Total Production Costs £000s
January	8	50
February	11	62
March	15	85
April	16	92
May	12	72
June	7	49
July	6	37
August	5	35
September	4	27
October	3	22
November	1	16
December	6	37

Assume that both the fixed costs and variable costs remained stable throughout the year.

- a) Draw a scatter diagram relating to the data provided above and plot on it the line of best fit. [10]
- b) i Calculate the expected total cost if 13,000 assemblies were produced in a particular month. [5 each]
- ii Estimate Bretts' monthly fixed costs. [5 each]
7. Hammer Corporation is an international import-export company dealing in plastic garden furniture. The majority of their imports come from Germany and they are concerned about the fluctuations in exchange rates that can affect their profitability, especially after the referendum result in the UK to leave the EU. They need to convert £Sterling to Euros and vice versa.
- a) Draw a conversion graph given that the conversion rate is £1 = €1.17. [6]
- b) Hammer receives an order for 24 furniture sets, which cost €750.00 each. With the aid of your graph, calculate the total cost of the order in £Sterling. [3]
- c) Following a reduction in base lending rates announced by the Bank of England, the exchange rate changed to £1 = €1.0615. Draw a further conversion graph for this new rate. [6]
- d) With the aid of the new graph and assuming that Hammer's profit margin is 65%, calculate the selling price in £Sterling for this new exchange rate. [5]
8. Classic car values have increased dramatically in recent years, due to the poor return on cash investments. Margaret bought a classic Mercedes-Benz sports car for £79,995. She expects its value to increase by an average 8% per year.
- a) Draw a graph to show the estimate of the car's expected value over a 10-year period. [10]
- b) Find:
- i the value which Margaret expects the car to be worth after 4 years [1]
- ii the rate of increase in the car's value after 5 years [4]
- iii the value of the car after 10 years [1]
- iv the rate of increase in the car's value after 8 years [4]