



# ICM

MARCH 2017

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. Sparks Electrical offers a discount of 8.5% of the bill if it is paid on time and a further discount of  $\frac{1}{20}$ th of the bill is deducted for early payment within 10 days. What **fraction** of the bill is deducted for early payment? [4]
2. Annette works as a customer adviser for a large department store. She receives a basic salary of £22,375 per year and is also paid commission on sales that she has made, which averages £95 per week. Her tax allowance is £11,000 for the current tax year 2016/2017. The basic rate of income tax is 20%. Calculate:
  - a) i her gross pay for the year [3]
  - ii the amount of tax she pays in this tax year [5]
  - iii her net pay for the year [1]
  - b) Annette's employer is considering a withdrawal of commission on sales, but proposing a 12% increase in basic salary for all staff to compensate for the loss of income. Sales are also projected to fall by 10-15% in the next year. Comment on whether Annette is better off receiving commission or the increased basic salary. [8]
3. Mark, Dawn and Zak are in a lottery syndicate and recently won £950,000 between them. They are considering how to share out the winnings and have made the following suggestions for the respective ratios. Calculate whether a), b) or c) is more beneficial for Dawn:
  - a) 3 : 2 : 5
  - b) 5 : 3 : 2
  - c) 3 : 1 : 1 [5]
4. Mysoft Engineering produces control assemblies. The fixed costs are £90 and the variable cost per assembly is £7.
  - a) Calculate an expression for total costs (c) in terms of q, the quantity produced. [3]
  - b) Use your answer in a) to determine the total costs if 170 motors are produced. [3]
  - c) Prepare a graph of the expression for total costs. [5]
  - d) Use your graph to determine the total cost if 100 motors are produced. [3]

*continued overleaf*

## PART B

5. The table below shows the distribution of salaries of employees in Blake Applications Ltd.
- | SALARY RANGE (£) | NO. OF EMPLOYEES |
|------------------|------------------|
| 5,000-9,999      | 83               |
| 10,000-14,999    | 198              |
| 15,000-19,999    | 137              |
| 20,000-24,999    | 57               |
| 25,000-29,999    | 32               |
| 30,000-34,999    | 29               |
| 35,000+          | 25               |
- a) Make the necessary calculations and draw a cumulative frequency. [8]  
b) Calculate the number of managers, given that senior managers' salaries are £30,000 and above, and middle managers' salaries are greater than £20,000. [2]  
c) Calculate the ratio of senior managers to middle managers. [3]  
d) Calculate the percentage of the workforce which is not senior or middle managers (i.e. other employees). [2]  
e) Draw a pie chart to show the distribution of employees, according to the salary. [5]
6. Bestwear is an exporter of plastic garden furniture and storage units. The majority of its business is with EU countries and the company is very aware of how fluctuations in exchange rates can influence the profitability of their business with countries within so-called Euroland, i.e. EU member states which have adopted the Euro. They need to convert £Sterling to Euros and vice versa.
- a) Draw a conversion graph given that the conversion rate is £1 = €1.19 [6]  
b) Use your graph to convert:  
i €75 to £Sterling  
ii £34.99 to Euros [2 each]  
c) The exchange rate fell to £1 = €1.13 following the UK's EU Referendum result. Draw a further conversion graph for this new rate. [6]  
d) Calculate the difference in price in Euros, using the two exchange rates, for a garden chair priced at £24.99. [4]
7. A filling station sold 125,000 gallons of unleaded petrol in one week. The three types of fuel sold by the filling station were in the proportion of:
- |                       |     |
|-----------------------|-----|
| Unleaded petrol       | 47% |
| Unleaded super petrol | 19% |
| Diesel                | 34% |
- a) Calculate the total sales of fuel in that week. [4]  
b) Draw a bar chart which shows the sales of the above types of fuel. [10]  
c) How much unleaded super petrol was sold? [3]  
d) How much diesel was sold? [3]
8. Andy invested £9,000 in an Instant Access Savings Account. The account attracts an interest rate of 0.8% per annum.
- a) Calculate the interest paid into the account in year one of his investment. [4]  
b) Draw a table to show the amount of money in the account at the end of EACH year, for a ten-year period. [4]  
c) Draw a curve to illustrate the growth of this investment. [6]  
d) If no money is withdrawn from the account:  
i how much is in the account after 6 years? [3]  
ii calculate the cumulative rate of growth after 9 years. [3]