

# Tree diagrams

## Question Paper 1

<b>Level</b>	A LEVEL
<b>Exam Board</b>	Edexcel
<b>Subject</b>	Mathematics
<b>Module</b>	Mechanics and Statistics
<b>Topic</b>	Conditional probability
<b>Sub-Topic</b>	Tree diagrams
<b>Booklet</b>	Question Paper 1

**Time Allowed:** 29 minutes

**Score:** /24

**Percentage:** /100

### Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

- 1 The employees of a company are classified as management, administration or production. The following table shows the number employed in each category and whether or not they live close to the company or some distance away.

	Live close	Live some distance away
Management	6	14
Administration	25	10
Production	45	25

An employee is chosen at random.

Find the probability that this employee

(a) is an administrator, (2)

(b) lives close to the company, given that the employee is a manager. (2)

Of the managers, 90% are married, as are 60% of the administrators and 80% of the production employees.

(c) Construct a tree diagram containing all the probabilities. (3)

(d) Find the probability that an employee chosen at random is married. (3)

An employee is selected at random and found to be married.

(e) Find the probability that this employee is in production. (3)

**(Total 13 marks)**

- 2 In a factory, machines  $A$ ,  $B$  and  $C$  are all producing metal rods of the same length. Machine  $A$  produces 35% of the rods, machine  $B$  produces 25% and the rest are produced by machine  $C$ . Of their production of rods, machines  $A$ ,  $B$  and  $C$  produce 3%, 6% and 5% defective rods respectively.
- (a) Draw a tree diagram to represent this information. **(3)**
- (b) Find the probability that a randomly selected rod is
- (i) produced by machine  $A$  and is defective,
  - (ii) is defective. **(5)**
- (c) Given that a randomly selected rod is defective, find the probability that it was produced by machine  $C$ . **(3)**

**(Total 11 marks)**