

3. The weights of packages that arrive at a factory are normally distributed with a mean of 18 kg and a standard deviation of 5.4 kg

(a) Find the probability that a randomly selected package weighs less than 10 kg

(3)

The heaviest 15% of packages are moved around the factory by Jemima using a forklift truck.

(b) Find the weight, in kg, of the lightest of these packages that Jemima will move.

(3)

One of the packages **not** moved by Jemima is selected at random.

(c) Find the probability that it weighs more than 18 kg

(4)

A delivery of 4 packages is made to the factory.
The weights of the packages are independent.

(d) Find the probability that exactly 2 of them will be moved by Jemima.

(3)

5. Rosie keeps bees. The amount of honey, in kg, produced by a hive of Rosie's bees in a season, is modelled by a normal distribution with a mean of 22 kg and a standard deviation of 10 kg.

(a) Find the probability that a hive of Rosie's bees produces less than 18 kg of honey in a season.

(3)

The local bee keepers' club awards a certificate to every hive that produces more than 39 kg of honey in a season, and a medal to every hive that produces more than 50 kg in a season. Given that one of Rosie's bee hives is awarded a certificate

(b) find the probability that this hive is also awarded a medal.

(5)

Sam also keeps bees. The amount of honey, in kg, produced by a hive of Sam's bees in a season, is modelled by a normal distribution with mean μ kg and standard deviation σ kg. The probability that a hive of Sam's bees produces less than 28 kg of honey in a season is 0.8413

Only 20% of Sam's bee hives produce less than 18 kg of honey in a season.

(c) Find the value of μ and the value of σ . Give your answers to 2 decimal places.

(6)