1 Adam made observations of the maximum temperature, t °C, on 30 days. His results are summarized by $\sum t = 915$ and, where $\sum(t - \bar{t})^2 = 870$, where $\bar{t}$ denotes the mean of the 30 observations. Calculate t and the standard deviation of the observations. [3]

2 Tyre pressure on a certain type of car follows a normal distribution with mean 2.0 bars and standard deviation 0.2 bars. Safety regulations state that the pressure must be within $2.0 - b$ and $2.0 + b$. It is known that 90% of the tyres are within the safety limits. Find the safety limits. [3]

3 A team of 4 is to be randomly chosen from 3 students and 5 teachers. The random variable X denotes the number of students in the team.

(i) Draw up a probability distribution table for X. [3]

(ii) Find Find E(X) and Var(X). [3]

4 There are thirty students in class *W*. A quiz is given for the students and the time taken (in minutes) by students to complete were recorded as below.

12	20	14	38	30	8	19	23	27	23	20	32	10	7	9
16	11	35	13	6	16	33	30	23	25	8	10	9	36	9

(i) Construct a stem and leaf diagram to illustrate the above data. [2]

(ii) Determine the median, lower quartile and third quartile. [3]

(iii) Draw a box-and-whisker plot to illustrate the above data. [3]

5 (a) Find the number of different four digit numbers that can be formed from digits 2, 3, 5, 7, 8 and 9 without repetition if

(i) the numbers are less than 7000, [2]

(ii) the numbers are odd. [2]

(b) Find the number of different selections of three letters that can be made from the word MANGANASE. [4]

6 In the first stage of a computer game, the player chooses, at random, one of 5 icons, only one of which is correct. If the correct icon is chosen, then in the second stage, the player chooses at random one of 8 icons, only one of which is correct. If an incorrect icon is chosen in the first stage, then in the second stage, the player chooses at random one of 10 icons, only one of which is correct. The events A and B are defined as follows.

A: the first icon chosen is correct.
B: the second icon chosen is correct.

(a) Illustrate the above situation by using a tree diagram. [1]

(b) Find

(i) $P(A \cap B)$ [1]

(ii) $P(B)$ [3]

(iii) $P(A \cup B)$ [2]

(iv) $P(A|B)$ hence, state whether events A and B are independent or not. [2]

7 A bakery makes 3 different types of cakes:

30% are sponge cake 30% are cheese cake 40% are fruit cake

(a) Twenty cakes are chosen at random. Find the probability that these cakes include

(i) exactly 9 cheese cakes. [2]

(ii) more than one fruit cake, [3]

(b) Find the smallest value of n if there is a probability of at least 0.75 that a random sample of n cake contains at least one sponge cake. [3]

(c) A sample of 150 cakes is chosen in the bakery, find the probability that there are at least 45 cheese cakes. [5]