

**Edexcel GCE**  
**Statistics S1**  
**Silver Level S3**  
**(Question Paper)**

**All exam papers are issued free to students for education purpose only.  
Mr.S.V.Swarnaraja (Marking Examiner, Team Leader & Author)  
www.swanash.com, Mobile: +94777304755 , email: swa@swanash.com**

Paper Reference(s)

**6683/01**

**Edexcel GCE**

**Statistics S1**

**Silver Level S3**

**Time: 1 hour 30 minutes**

**Materials required for examination papers**

Mathematical Formulae (Green)

**Items included with question**

Nil

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulas stored in them.

### **Instructions to Candidates**

---

Write the name of the examining body (Edexcel), your centre number, candidate number, the unit title (Statistics S1), the paper reference (6683), your surname, initials and signature.

### **Information for Candidates**

---

A booklet 'Mathematical Formulae and Statistical Tables' is provided.

Full marks may be obtained for answers to ALL questions.

There are 8 questions in this question paper. The total mark for this paper is 75.

### **Advice to Candidates**

---

You must ensure that your answers to parts of questions are clearly labelled.

You must show sufficient working to make your methods clear to the Examiner. Answers without working may gain no credit.

### **Suggested grade boundaries for this paper:**

<b>A*</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>65</b>	<b>58</b>	<b>51</b>	<b>44</b>	<b>36</b>	<b>29</b>

1. A young family were looking for a new 3 bedroom semi-detached house. A local survey recorded the price  $x$ , in £1000, and the distance  $y$ , in miles, from the station of such houses. The following summary statistics were provided

$$S_{xx} = 113\,573, S_{yy} = 8.657, S_{xy} = -808.917$$

- (a) Use these values to calculate the product moment correlation coefficient. (2)
- (b) Give an interpretation of your answer to part (a). (1)

Another family asked for the distances to be measured in km rather than miles.

- (c) State the value of the product moment correlation coefficient in this case. (1)

**June 2007**

---

2. The random variable  $X \sim N(\mu, 5^2)$  and  $P(X < 23) = 0.9192$ .

- (a) Find the value of  $\mu$ . (4)
- (b) Write down the value of  $P(\mu < X < 23)$ . (1)

**May 2011**

---

3. The discrete random variable  $X$  has probability distribution given by

$x$	-1	0	1	2	3
$P(X = x)$	$\frac{1}{5}$	$a$	$\frac{1}{10}$	$a$	$\frac{1}{5}$

where  $a$  is a constant.

(a) Find the value of  $a$ . (2)

(b) Write down  $E(X)$ . (1)

(c) Find  $\text{Var}(X)$ . (3)

The random variable  $Y = 6 - 2X$ .

(d) Find  $\text{Var}(Y)$ . (2)

(e) Calculate  $P(X \geq Y)$ . (3)

**May 2010**

---

4. In a company the 200 employees are classified as full-time workers, part-time workers or contractors.

The table below shows the number of employees in each category and whether they walk to work or use some form of transport.

	Walk	Transport
Full-time worker	2	8
Part-time worker	35	75
Contractor	30	50

The events  $F$ ,  $H$  and  $C$  are that an employee is a full-time worker, part-time worker or contractor respectively. Let  $W$  be the event that an employee walks to work.

An employee is selected at random.

Find

(a)  $P(H)$  (2)

(b)  $P([F \cap W]')$  (2)

(c)  $P(W|C)$  (2)

Let  $B$  be the event that an employee uses the bus.

Given that 10% of full-time workers use the bus, 30% of part-time workers use the bus and 20% of contractors use the bus,

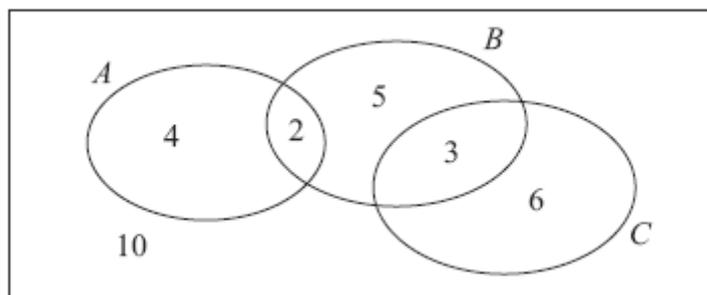
(d) draw a Venn diagram to represent the events  $F$ ,  $H$ ,  $C$  and  $B$ , (4)

(e) find the probability that a randomly selected employee uses the bus to travel to work. (2)

**May 2013**

---

5. The Venn diagram in Figure 1 shows the number of students in a class who read any of 3 popular magazines  $A$ ,  $B$  and  $C$ .



**Figure 1**

One of these students is selected at random.

- (a) Show that the probability that the student reads more than one magazine is  $\frac{1}{6}$ . **(2)**
- (b) Find the probability that the student reads  $A$  or  $B$  (or both). **(2)**
- (c) Write down the probability that the student reads both  $A$  and  $C$ . **(1)**

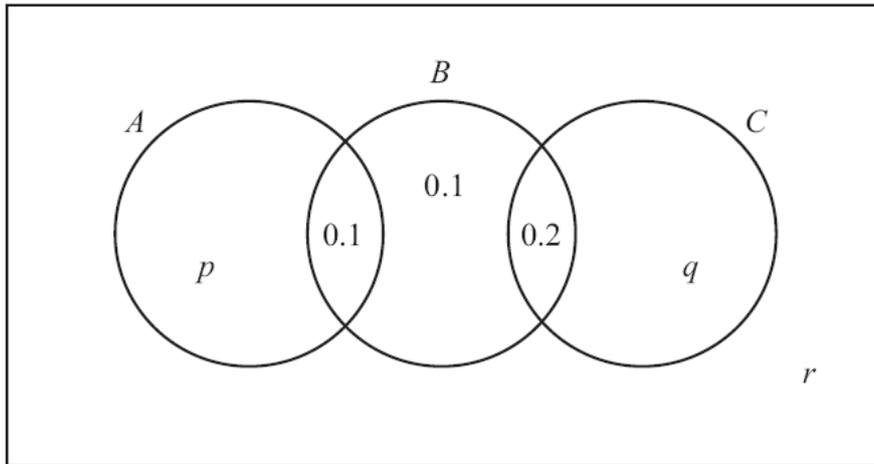
Given that the student reads at least one of the magazines,

- (d) find the probability that the student reads  $C$ . **(2)**
- (e) Determine whether or not reading magazine  $B$  and reading magazine  $C$  are statistically independent. **(3)**

**May 2010**

---

6.



**Figure 1**

The Venn diagram in Figure 1 shows three events  $A$ ,  $B$  and  $C$  and the probabilities associated with each region of  $B$ . The constants  $p$ ,  $q$  and  $r$  each represent probabilities associated with the three separate regions outside  $B$ .

The events  $A$  and  $B$  are independent.

(a) Find the value of  $p$ .

**(3)**

Given that  $P(B|C) = \frac{5}{11}$ ,

(b) find the value of  $q$  and the value of  $r$ .

**(4)**

(c) Find  $P(A \cup C | B)$ .

**(2)**

**May 2013 (R)**

---

7. The heights of a population of women are normally distributed with mean  $\mu$  cm and standard deviation  $\sigma$  cm. It is known that 30% of the women are taller than 172 cm and 5% are shorter than 154 cm.

(a) Sketch a diagram to show the distribution of heights represented by this information. (3)

(b) Show that  $\mu = 154 + 1.6449\sigma$ . (3)

(c) Obtain a second equation and hence find the value of  $\mu$  and the value of  $\sigma$ . (4)

A woman is chosen at random from the population.

(d) Find the probability that she is taller than 160 cm. (3)

**January 2010**

---

8. The lifetimes of bulbs used in a lamp are normally distributed.

A company  $X$  sells bulbs with a mean lifetime of 850 hours and a standard deviation of 50 hours.

(a) Find the probability of a bulb, from company  $X$ , having a lifetime of less than 830 hours. (3)

(b) In a box of 500 bulbs, from company  $X$ , find the expected number having a lifetime of less than 830 hours. (2)

A rival company  $Y$  sells bulbs with a mean lifetime of 860 hours and 20% of these bulbs have a lifetime of less than 818 hours.

(c) Find the standard deviation of the lifetimes of bulbs from company  $Y$ . (4)

Both companies sell the bulbs for the same price.

(d) State which company you would recommend. Give reasons for your answer. (2)

**May 2009**

---

**TOTAL FOR PAPER: 75 MARKS**

**END**