

## ENGINEERING AND SCIENCE ADMISSIONS TEST

### ESAT Mock Paper 2 — PART E Mathematics 2

40 minutes

#### INSTRUCTIONS TO CANDIDATES

**Please read these instructions carefully, but do not open this question paper until you are told that you may do so.**

A separate answer sheet is provided for this paper. Please check you have all three pages. Write your name in the space provided on each page, and circle the part you are answering at the top of page 2 and page 3.

At the end of 40 minutes, your supervisor will collect this question paper and corresponding answer sheet before giving out the next part.

This test comprises **five** parts: **A, B, C, D** and **E**.

**All** candidates should complete **PART A Mathematics 1**

**All** candidates should then complete **two** further parts chosen from:

<b>PART B</b>	Biology
<b>PART C</b>	Chemistry
<b>PART D</b>	Physics
<b>PART E</b>	Mathematics 2

Each part has 27 multiple-choice questions, with 40 minutes to answer them. For each question, choose the **one** option you consider correct.

There are no penalties for incorrect responses, only marks for correct answers, so you should attempt all of the questions in your **three** parts. Each question is worth one mark.

You **must** complete the answer sheet within the time limit. Only your responses on the answer sheet will be marked.

Dictionaries and calculators are NOT permitted.

**Please wait to be told you may begin before turning this page.**

## PART E Mathematics 2

1. Find the value of  $\int_0^1 \frac{3x^2+2x-1}{\sqrt{x}} dx$

**A**  $\frac{16}{5}$

**B**  $-\frac{28}{15}$

**C**  $\frac{104}{105}$

**D**  $\frac{8}{15}$

**E**  $\frac{68}{15}$

2. A bag contains  $g$  green beans,  $r$  red beans and  $b$  blue beans. Three beans are chosen at random and not replaced. What is the probability that exactly two of the three beans are blue?

**A**  $\frac{b^2(r+g)}{(g+r+b)^3}$

**B**  $\frac{3b^2(r+g)}{(g+r+b)(r+g+b-1)(r+g+b-2)}$

**C**  $\frac{b(b-1)(r+g)}{(g+r+b)(r+g+b-1)(r+g+b-2)}$

**D**  $\frac{3b(b-1)(r+g)}{(g+r+b)^3}$

**E**  $\frac{3b(b-1)(r+g)}{(g+r+b)(r+g+b-1)(r+g+b-2)}$

**F**  $\frac{b(b-1)(r+g)}{(g+r+b)^3}$