1. Question part 1/2 | 5090 May-June 2025 P4 V1 Q3

3 **(a)** Urine tests can be used to diagnose diseases.

Indicator paper strips are dipped into a sample of urine. They detect substances excreted in the urine sample that are not normally present in the urine of a healthy person.

Three examples of indicator paper strips are:

- Diastix® to detect glucose
- Albustix® to detect protein
- Ketostix® to detect ketones.

Patients with diabetes excrete glucose and ketones.
Patients with nephritis excrete protein.
Patients with malnutrition excrete ketones.

Table 3.1 shows the results of tests on the urine samples of four individuals (**D**, **E**, **F** and **G**). A tick (✓) indicates a positive test and a cross (✗) indicates a negative test.

Table 3.1

indicator test strip	urine sample			
	D	**E**	**F**	**G**
Diastix®	✗	✓	✗	✗
Albustix®	✓	✗	✗	✗
Ketostix®	✗	✓	✗	✓

(i) State and explain which individual is healthy.

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(ii) State and explain which individual has diabetes.

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1. Question part 2/2 | 5090 May-June 2025 P4 V1 Q3

(b) The pH of urine in healthy humans is normally 6.5. The pH of urine can be measured using universal indicator paper strips.

A scientist wants to determine whether the pH of human urine is affected by the volume of water drunk. For her investigation she selects 20 healthy female volunteers of similar age and weight.

Plan a method the scientist could use for her investigation.

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[Total: 9]