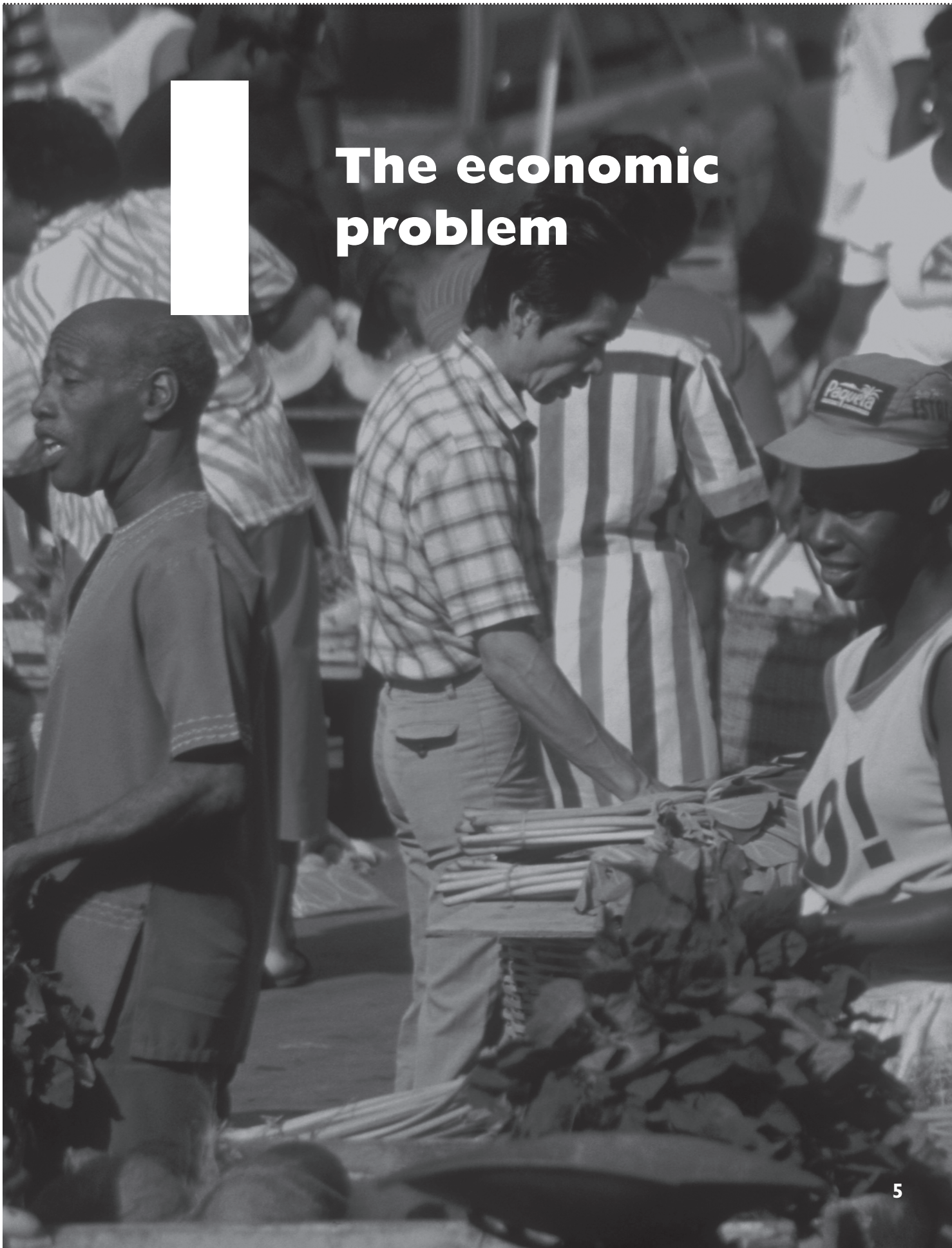
# 1 The economic problem



**LEARNING OBJECTIVES**

- Define scarcity.
- Identify three main choices: what, how and for whom to produce.
- Explain opportunity cost.
- Explain the production possibility frontier and diminishing, increasing and constant returns.
- Explain Pareto optimality.

**REQUIRED KNOWLEDGE**

- Introductory knowledge of scarcity
- Opportunity costs
- Economic systems
- Free and economic goods.

**TOPIC VALUE**

Scarcity is the world's most pressing problem, especially for poorer nations.

# Introduction

The subject 'economics' derives its name from the Greek word 'Oikonomia', which means household management. In effect, that is, deriving the best value and benefit from the limited resources of the household as it seeks to satisfy the wants and needs of its members.

To economise is simply the prudent use of resources. The word 'economy' refers to a system in which domestic producers, consumers and the government interact, each in their own interest. This is called a closed economy. A four-sector or open economy includes the government, domestic producers, consumers and the foreign sector.

Economics is usually explained as the study of how human wants are satisfied with resources that are not only scarce, but which can also be used in alternative ways.

An **economic problem** exists when society's unlimited wants and needs cannot be satisfied by the world's limited resources. There are several economic problems in society, such as poverty, unemployment and squatter settlements, to name a few. These all result from a problem of scarcity.

Scarcity in this sense does not mean something 'rare' but rather the inability to satisfy human wants. Table 1.1 below summarises the scarcity problem.

**Table 1.1 The scarcity problem**

| Limited resources | Unlimited wants | Economic problem |
|---|---|---|
| Houses | Housing | Homelessness, squatting |
| Classroom, facilities, teachers | Education | Lack of skills, illiteracy |
| Arable land | Food | Labour, poverty, malnutrition |

Limited resources refer to the means of production that are used to create goods and services. These resources are also called factor inputs or factors of production and consist of land, labour, capital and enterprise. These resources will be discussed in greater detail in a later chapter but, briefly, they are explained as:

- **Land: anything above or below the ground that is provided by nature, e.g., air, sunshine, fish, minerals, trees, water; also called natural resources.**
- **Labour: human mental or physical effort of any kind, e.g., skilled, unskilled or a professional type of skilled labour such as a brain surgeon.**
- **Capital: producer goods that enable future production; this is also called manufactured resources, e.g., machines.**
- **Enterprise: This is also considered a human resource because it organises and coordinates the other factor inputs to produce goods and services.**

Citizens living in very developed countries like the USA or Europe enjoy more than the basic comforts of life, yet they desire more luxuries.

Since scarcity is the inability to satisfy human wants, developed countries suffer from the scarcity problem just as developing countries do.

## Key points

Scarce resources such as land, labour, capital and enterprise combine to produce goods and services to satisfy society's needs and wants. Scarcity exists in developing as well as developed countries.

When resources are limited in supply and wants and needs are unlimited, it is necessary to use limited resources prudently. A society cannot have everything all at once; choices therefore have to be made. The three most basic choices all societies must make are:

1. **What to produce? The question relates to what goods and services are to be produced and in what combination. Should a society produce more consumer goods such as, for example, cell phones, cars, food, clothes, or capital goods such as factories and machines? What is clear is that producing more of one type of good means less of the other due to limited resources. What to produce then may simply be referred to as the *product combination* that a society chooses.**
2. **How to produce? The choice to be made in this case is the combination of factors of production that should be used. Should sugar cane production in Barbados use more labour than capital or vice versa? Less labour would mean releasing human labour and replacing it with machines, for example reaping sugar cane with a mechanical harvester. A mechanical harvester would do a more efficient job because producers would aim to get the greatest output (sugar) from the smallest input (harvester), so it becomes a choice of the factor combination that achieves the lowest cost of production.**

3. **For whom to produce? This question concerns the manner in which the goods and services produced are distributed. This is so since a limited quantity becomes available to individuals who may desire more than the quantity offered to them. Think of tickets for a limited overs cricket match or tickets for the World Cup. Lines are formed to distribute the available quantity because the capacity at the stadium is fixed.**

Various means have also been used to distribute goods and services such as:

- **Lotteries**
- **Rationing (especially during a shortage)**
- **Food stamps**
- **A system of merit or need**
- **A price system**
- **Queues.**

The price system, however, works well for high-income earners, whose money may command a bigger claim to scarce goods and services than low-income earners. The 'for whom' issue, therefore, is considered very important, since it is people who own wealth that command the majority share of output. The reason for this is attributed to an unequal distribution of income.

## Key point

The three basic choices all societies must make are what, how and for whom to produce, with the limited resources that are available at any given point in time. The 'for whom' question is important because it is linked to poverty and the standard of living.

## Opportunity cost

Making a choice implies a sacrifice. For example, if you go to a cafeteria with limited pocket money you may choose one item and give up purchasing the others. You cannot choose everything you see because your money is limited.

The choice of a soft drink may mean giving up a chocolate bar. The sacrifice of giving up the chocolate bar is referred to as the opportunity cost of purchasing a soft drink. The real or opportunity cost of purchasing the soft drink is different from the money cost of the soft drink. Opportunity cost may therefore be defined as the sacrifice of the next best choice whenever economic decisions are made.

## Common error

Be careful to distinguish between choice numbers 1 and 2, 3, 4, 5 or 6. The opportunity cost of choosing number 1 is choice number 2 given up, not the third, fourth, fifth or the sixth choice on sale in the cafeteria. There are other costs which will be explored in subsequent chapters.

Other examples of opportunity cost are given in table 1.2:

**Table 1.2 Opportunity cost**

| Decision | Choice | Opportunity cost |
|---|---|---|
| Firm | Purchasing vehicles | Investing the money in the bank |
| Government | Building three schools | Building access roads for farmers |
| Community | Building a community centre | Buying a cricket ground |
| Family | Sending a student to university | Renovating the roof |

A very simple explanation of opportunity cost is illustrated by a diagram called the production possibility frontier (PPF), also sometimes called a production possibility curve, production transformation curve or production possibility boundary.

A production possibility curve shows the different combinations of two types of goods that a country's resources can produce when all of the resources are fully employed. Be mindful that many goods are produced in a country but, to illustrate the point, only two are chosen to explain the concept of opportunity cost. Choosing only two goods therefore is a limiting assumption. Other assumptions that are made when drawing the production possibility curve are:

- **Technology is fixed.**
- **No foreign trade exists.**
- **Output is measured on a yearly basis.**
- **The level of resources is fixed.**
- **Output is measured in units.**
- **Resources are perfectly mobile.**

A production possibility curve can be plotted from table 1.3, showing different combinations of bananas and oil production in a Caribbean territory.

**Table 1.3 Production possibility and opportunity cost**

| Combination | Bananas (000 kg) | Oil barrels (000 bpd) |
|---|---|---|
| A | 8 | 0 |
| B | 7 | 3 |
| C | 6 | 5 |
| D | 5 | 6.3 |
| E | 4 | 7 |
| F | 3 | 7.5 |
| G | 2 | 8 |
| H | 1 | 8.5 |
| I | 0 | 9 |

If the data in table 1.3 is plotted on a graph, it would look like the production possibility curve shown in figure 1.1.

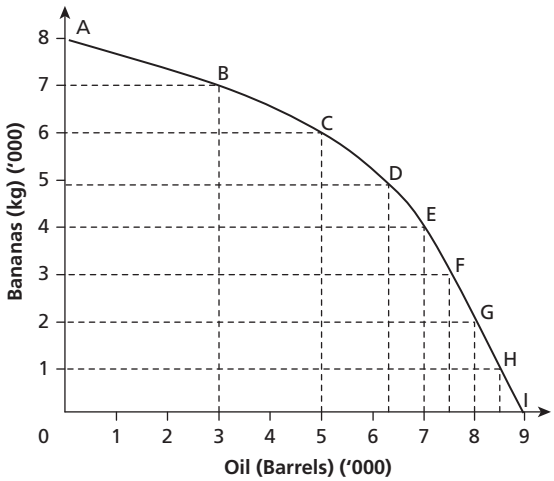



**Figure 1.1** Combinations of a production possibility curve showing increasing opportunity cost

## Observations

If only bananas are produced and no resources allocated to oil production, then 8,000 kg of bananas will be produced and zero barrels of oil. Similarly, if only oil is produced then 9,000 barrels per day (bpd) would be produced and 0 kg of bananas. Society, however, needs both goods; therefore, moving from combination A to B requires a shift of factor inputs from banana production to oil. When this happens, 1,000 kg of bananas are given up to produce 3,000 barrels of oil at a ratio of 1 kg of bananas to three barrels of oil. The gradient or slope of the curve at that point therefore is a loss of one to gain three. We conclude that the opportunity cost of choosing combination B over A is 1,000 kg of bananas. Note: because the curve is not a straight line it has a different slope at different points.

## Key point

Choosing a different combination of two goods incurs an opportunity cost, which expresses what is sacrificed in order to produce another good.

### Reason for the concave shape of the PPF

The PPF owes its 'bowed out' or concave shape to the law of increasing costs. Refer again to table 1.3 and figure 1.1.

Careful reading would reveal that moving from combination A to B sacrifices the resources producing 1,000 kg of bananas to achieve 3,000 barrels of oil. Moving down the PPF to combination C, D, E and F, the same 1,000 kg of bananas given up yield 2,000 barrels of oil for combination C but not for combination D, E and F. From combination B to C yields 2,000 bpd, C to D yields 1,300 and only 500 barrels of oil for combinations E to F.

This may be explained by the fact that the resources are more suited to banana production than oil production and adding these extra resources to oil production eventually leads to overcrowding of fixed oil resources, causing the rate of production to decrease. This is due to an important law in economics called the law of diminishing returns or the law of increasing costs.

### Reason for the convex shape of the PPF

Table 1.4 and figure 1.2 illustrate a different PPF with a 'bowed in' or convex shape. On this occasion, moving down the curve from different combinations between A to F results in sacrificing resources producing 20 kg of bananas and applying these resources to achieve more and more barrels of oil.

**Table 1.4 Combinations of a PPF decreasing opportunity cost**

| Combination | Bananas (000 kg) | Oil (000 bpd) |
|---|---|---|
| A | 80 | 0 |
| B | 60 | 10 |
| C | 40 | 25 |
| D | 20 | 50 |
| E | 0 | 100 |

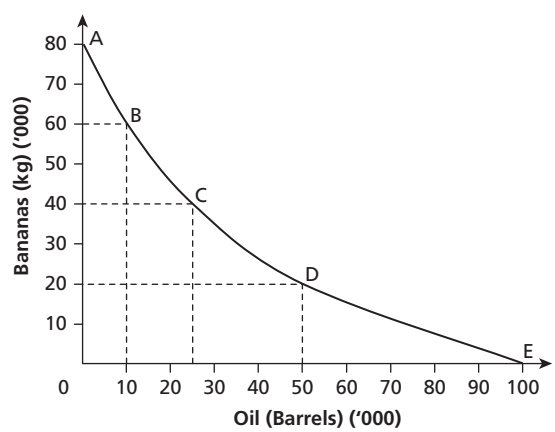



**Figure 1.2** Combinations of a PPF showing decreasing opportunity cost

Moving from combination A to B on figure 1.2, 20 kg of bananas are given up to allow resources to transfer to oil where the gain in oil is 10 barrels.

Moving from point B to point C, 20 kg of bananas given up yield 15 barrels of oil. Note again that from combination C to D the gain in oil is 25 barrels and D to E, 50 barrels. In this case, the resources taken from bananas and redirected to oil is better suited to oil production than bananas. This is the law of decreasing opportunity cost in action. It is also called the law of increasing returns in production.

## Summary

When the PPF is convex to the origin, moving down the curve from left to right results in **increasing returns or decreasing opportunity costs**.

## The linear PPF

A close examination of the linear PPF in figure 1.3 shows that moving from combinations A through to F indicates a one-to-one ratio, that is, 1,000 kg of corn given up would yield 1,000 kg of peas. The conclusion to be drawn in this instance is that resources are equally productive when they are allocated to either good. We refer to this phenomenon as the **law of constant opportunity costs**.

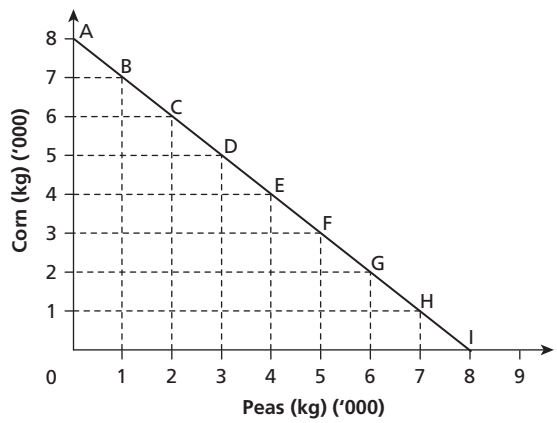



**Figure 1.3** Combinations of the linear PPF showing constant opportunity cost

This curve is typical of production of similar goods, for example, corn and peas production.

## Key point

A linear production possibility frontier illustrates an equal ratio of exchange when resources are shifted from the production of one good to the other.

## Points within and outside the PPF

A combination of bananas and oil represented in figure 1.4 by point X, that is, 40,000 bananas and 40,000 bpd of oil means that resources are inefficiently employed or that there are unemployed resources yielding less output of both goods. Moving to point $X_1$ (75,000 bananas and 80 bpd of oil) and using idle resources yields more of both goods. This point illustrates efficiency in production.

Over a 10–20-year period, new technology, inventions resulting from research and development, innovation and investment that increase capacity, may shift the curve outward resulting in production of more of both goods as illustrated in point $X_2$. This is also referred to as long-term economic growth.

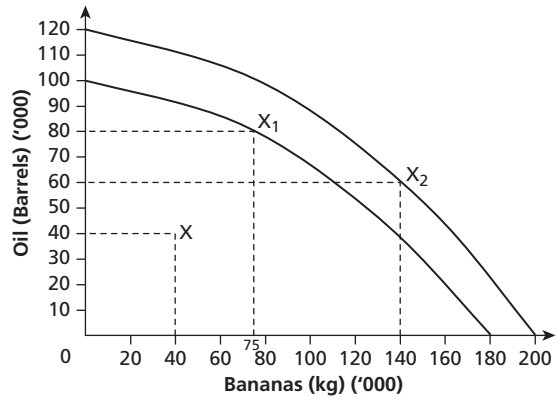



**Figure 1.4** Combinations showing points within and outside the PPF

## Summary

Points within the PPF denote underemployed resources or inefficiency in production, while points on the curve denote efficiency. Points beyond the PPF are unattainable in the present but may be attainable in the future, if productivity increases and other newly discovered resources shift the curve outward, as $X_2$.

# Pareto optimality

Pareto optimality is achieved when goods and services are produced in the quantities desired by society (allocative efficiency) and at the lowest cost (productive efficiency). When this is achieved it is impossible to allocate resources in an economic system, improving the position of some without reducing the position of others.

If resources are employed and everyone benefits and no one loses, this is called a Pareto Improvement. Pareto efficiency is then said to be achieved when it is impossible to improve someone's position without reducing the position of others.

Pareto optimality then has to do with the allocation of all resources related to production, distribution and consumption. Pareto optimality exists on all points on the production possibility curve. This concept is analysed in greater detail in chapter 14.

# Chapter summary

- **Economics is the study of how man satisfies his unlimited wants with his limited resources that have alternative uses.**
- **All economic problems such as unemployment, poverty, pollution, price level increases (inflation), foreign exchange shortages, food, housing, schooling, transport shortages are linked to the problem of scarcity.**

- Scarcity implies choice. The main choices related to scarcity are what, how and for whom to produce with limited resources.
- Limited resources refer to land, labour and capital. Human enterprise is also recognised as a crucial factor of production because of risk taking, decision making and coordinating the other factors of production.
- Opportunity cost is different from the money costs of an economic decision. It is the sacrifice of the second best alternative.

## Practice questions

1. A worker in a Jamaican factory is currently earning J$300.00 for a 30-hour working week. He is offered a 10 per cent wage increase or a basic wage of J$310.00 and reduced working hours of 28 hours. What is the opportunity cost if the worker chooses 28 hours of work?
   a. 2 hours
   b. 28 hours
   c. J$10.00
   d. J$20.00

2. Which of the following best defines the concept of 'scarcity'?
   a. Goods and services to consumers are in short supply.
   b. There are not enough resources available at present.
   c. The excess of human wants over the economy's resources.
   d. The wants of society are greater than the supply of goods.

3. A potter can make any combination of items using the following options below.

| Cups | Saucers |
|---|---|
| 94 | 13 |
| 70 | 16 |

   What is the opportunity cost of making one saucer?
   a. 1 cup
   b. 5 cups
   c. 7 cups
   d. 8 cups

4. Which of the following statements **BEST** defines a 'production possibility frontier'?
   a. The limit of the combinations of goods and services that can be produced
   b. The combinations of goods and services that may be produced in a country
   c. The mixture of goods and services that are desired by a country
   d. An illustration of an economy producing goods and services for its citizens.

5. A Business teacher in Barbados ranks his many employment options in the following order:
   (1) Economics teacher (2) Insurance executive,
   (3) Banking officer (4) Marketing manager
   (5) Investment analyst.

   What is the opportunity cost of choosing to be an Economics teacher?
   a. Investment analyst
   b. Marketing manager
   c. Bank officer
   d. Insurance executive.