Consider the following statements about politics and politicians:

I	**III**
Practical politics consists in ignoring facts. *Henry Adams*	A politician need never apologise for opportunism in action, but he should always be ashamed of compromise in thought. *Walter Bagehot*
II	**IV**
The hardest thing about any political campaign is how to win without proving that you are unworthy of winning. *Adlai E. Stevenson*	Finality is not the language of politics. *Benjamin Disraeli*

1. Statement **II** suggests that successful political campaigns are based on
   a. firm principles.
   b. reasoned argument.
   c. outward appearances.
   d. Straightforward tactics.

2. Which two statements are the most negative about politics?

   a. I and II

   b. I and III

   c. II and III

   d. III and IV

The diagram below plots political attitudes
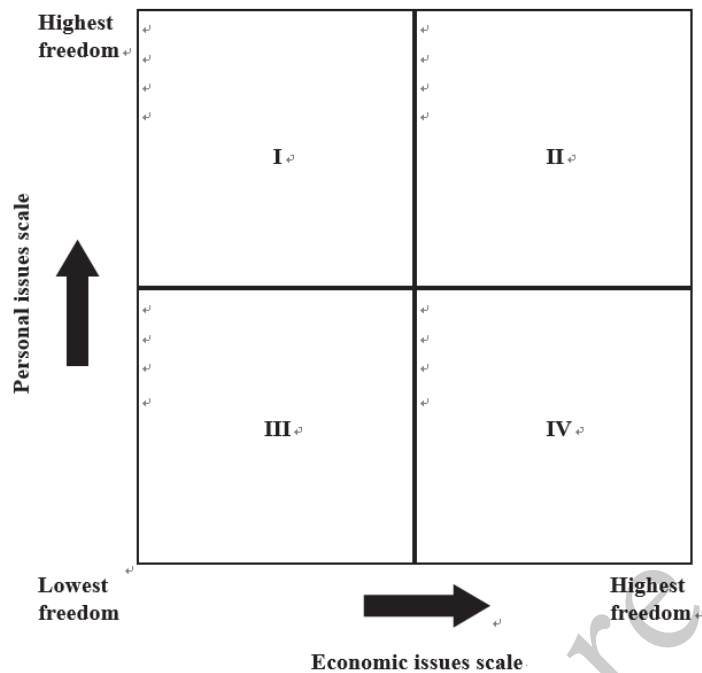
The **Personal issues scale** measures attitudes to matters concerning personal freedom. At the lowest end of the scale are the attitudes of those who believe in significant restriction of personal freedom.

The **Economic issues scale** measures attitudes to matters concerning economic freedom. At the lowest end of the scale are the attitudes of those who believe in strict regulation of economic activity.

3. Which sector of the diagram applies to someone who believes that military service should be compulsory and that individuals should make arrangements for funding their own retirement?

    a.   **I**
    b.   **II**
    c.   **III**
    d.   **IV**

4. Which of the following opinions would someone in sector **I** most likely agree with?

    a.   There should be no censorship of books and films for adults.
    b.   Traditional marriage between consenting adults should be prohibited.
    c.   Employers should be free to pay workers according to their social status.

    d.   Freedom to create wealth without government regulation is fundamental.

The graphs below show the results of a study of factors that influence energy use during the migratory flight of birds of the same species. Energy expenditure is indicated by heart rate in beats per second (bps). The higher the heart rate the greater the amount of energy used per kilometre of flight. The study examined the effect on heart rate of four factors:

- wind speed in the direction opposing flight, in metres per second (m/s)

- wingtip roundedness, in curvilinear units (C)

- wing loading (bird mass divided by wing area), in kilograms per square metre (kg/m2)

- pressure vertical velocity, in pascals per second (Pa/s).

Each graph indicates the change in heart rate of a flying bird in relation to changes in one of the four factors. Changes are shown relative to standard conditions, indicated by the point (0,0).
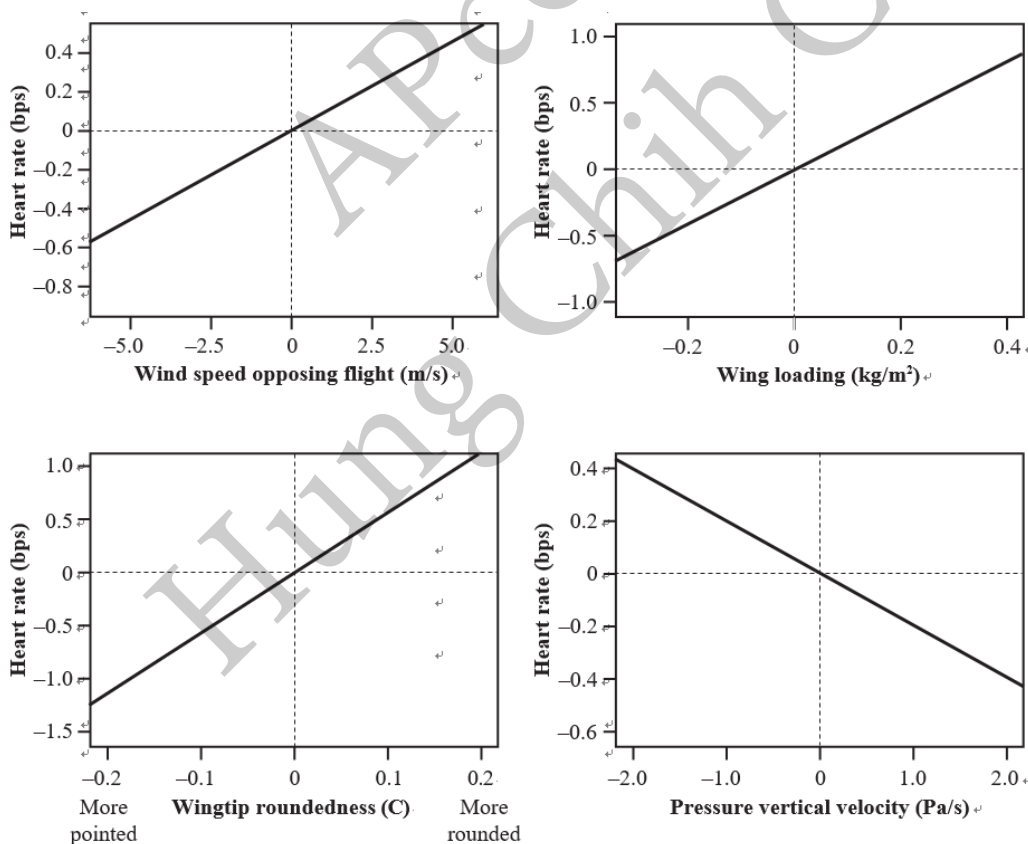
- Assume that the effects on heart rate of changes in factors are additive. For example, a 2.5 m/s increase in wind speed and a 2.0 Pa/s increase in pressure

vertical velocity will have a net effect on a flying bird's heart rate of −0.2 bps (i.e. 0.2 plus −0.4 = −0.2 bps).

5. Suppose several of the birds, of equal mass, undertake a flight during which wind speed opposing flight and pressure vertical velocity remain standard.

    The bird using the most energy per kilometre of flight will most likely have the

    a. largest wings with the most pointed wingtips.

    b. smallest wings with the most rounded wingtips.

    c. largest wings with the most rounded wingtips.

    d. smallest wings with the most pointed wingtips.

6. f all other factors are standard, which of the following changes is likely to cause a flying bird's heart to beat the slowest?

    a. 2.5 m/s decrease in wind speed

    b. 0.4 kg/m2 increase in wing loading

    c. 0.2 C decrease in wingtip roundedness

    d. 1 Pa/s increase in pressure vertical velocity

7. The table indicates weather conditions encountered by each of four physically identical birds during a non-stop, one-kilometre flight.

Bird	Pressure vertical velocity (Pa/s)	Wind speed opposing flight (m/s)
I	2.0 above standard	2.5 below standard
II	2.0 below standard	2.5 above standard
III	standard	2.5 above standard
IV	1.0 below standard	standard

Assuming each bird has the same energy expenditure, in what order will they arrive at their destination?

    a. **I** first, followed by **III** and **IV** close together, and **II** last

    b. **I** first, followed by **II**, then **III** and **IV** close together

    c. **II** first, followed by **III** and **IV** close together, and **I** last

    d. **II**, **III** and **IV** close together, and **I** last

12,178 women were questioned about their reproductive history, demography, lifestyle and innate hand preference, and their answers were recorded to provide a "baseline". The same women were interviewed 16 years later, and the data was used to calculate total person-years lived in the sample.

The sample comprised 11.6 % left-handed women. Mean age at baseline was similar for left and non-left-handed women: 47.4 and 47.0 years respectively. These groups did not differ in anthropometry, socioeconomic status, smoking habits or family history of breast cancer. The only difference was in child bearing: 21.8 % of left-handed versus 10.9 % of non-left-handed women had borne no children. 426 women from the whole group had breast cancer.

The non-left-handed group was taken as the reference group. The relative risk for breast cancer in left-handed women compared with non-left-handed women was calculated and was 1.39 overall (see table).

Association between handedness and incidence of breast cancer in study participants followed up at 16 years			
Innate handedness	Cases of breast cancer	Estimated person-years lived	Relative risk
Total			
non-left-handed	361	153422	1
left-handed	65	19119	1.39
Pre-menopausal breast cancer*			
non-left-handed	57	32113	1
left-handed	15	3329	2.41
Post-menopausal breast cancer*			
non-left-handed	257	127426	1
left-handed	39	17665	1.12
Body mass index ≤ 25			
non-left-handed	217	95964	1
left-handed	45	11332	1.62
Body mass index > 25			
non-left-handed	144	57458	1
left-handed	20	7787	1.05
Had not borne children			
non-left-handed	61	16486	1
left-handed	9	3759	0.68
Had borne children			
non-left-handed	300	136936	1
left-handed	56	15360	1.58

information on timing of menopause relative to incidence of breast cancer was not available.

8. Which one of the following, if true, would be a plausible reason for the apparent increased risk of breast cancer in left-handed women shown by the study?
   a. Normalizing the data to 1 for right handed women will bias the percentages.
   b. Having a child increases the risk of breast cancer.

    c. In the 16 years of the study, women may develop breast cancer but are unlikely to change from being left to right handed.

    d. The same hormonal changes in the mother cause the fetus to have a tendency to be left-handed and to have a susceptibility to breast cancer.

    e. The large majority of right-handed women in the group means that their breast cancer incidence will be divided by a very large number.

Nitrogen cycle

Nitrogen is essential for the formation of amino acids in proteins. The nitrogen cycle is a model that explains how nitrogen is recycled.

About 78 per cent of the air is nitrogen. Because nitrogen is so unreactive, it cannot be used directly by plants to make protein. Only nitrates are useful to plants, so nitrogen must be converted to nitrates.
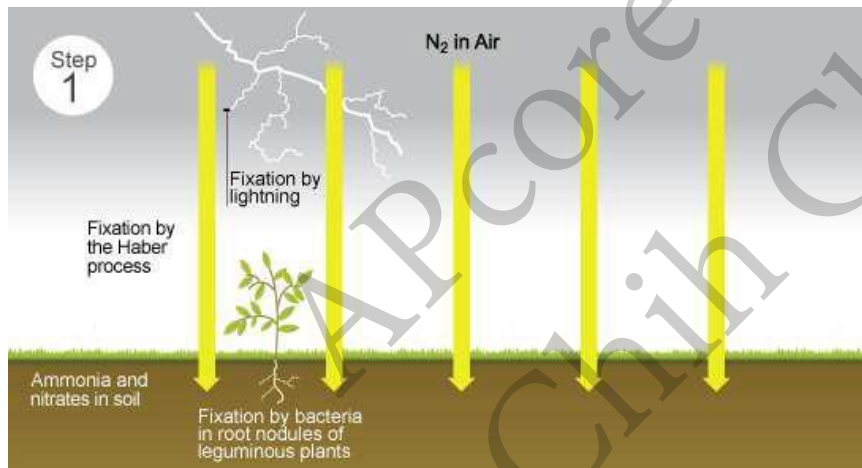
Nitrogen gas is converted to nitrate compounds by nitrogen-fixing bacteria in soil or root nodules. Lightning also converts nitrogen gas to nitrate compounds. The Haber process converts nitrogen gas into ammonia for use in artificial fertilizers. Ammonia is converted to nitrates by nitrifying bacteria in the soil.

9. The visual information represents:

a. A simplified version of the Nitrogen cycle.

b. A complete understanding of Nitrogen fixation.

c. A misleading picture of a complex scientific phenomenon.

d. One aspect of the Nitrogen cycle.

Ans: CCDAB CADD