



# Victorian Certificate of Education 2010

## General Achievement Test

Thursday 10 June 2010

Reading time: 10.00 am to 10.15 am (15 minutes)

Writing time: 10.15 am to 1.15 pm (3 hours)

### QUESTION BOOK

#### Structure of book

<i>Type of questions</i>	<i>Number of questions to be answered</i>	<i>Suggested times (minutes)</i>	<i>Suggested time allocation</i>
Writing Task 1	1	30	10.15 – 10.45
Writing Task 2	1	30	10.45 – 11.15
Multiple-choice questions	70	120	11.15 – 1.15

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners, rulers, and an English and/or bilingual dictionary.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- No calculator is allowed in this examination.

#### Materials supplied

- Question book of 36 pages.
- Answer book for **both** Writing Task 1 and Writing Task 2.
- Answer page for multiple-choice questions on page 15 of the answer book.

#### Instructions

- Write your **student number** and **student name** on the answer book.
- Write your **student name** on the answer page for multiple-choice questions on page 15 of the answer book.
- Follow the times suggested for each task.
- You may complete tasks in any order and you may return to any task at any time.
- Do not waste time on one particular multiple-choice question. If you find a question very difficult, return to it later.
- Answer all questions.
- All written responses must be in English.

#### At the end of the test

- You may keep this question book.

**Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.**

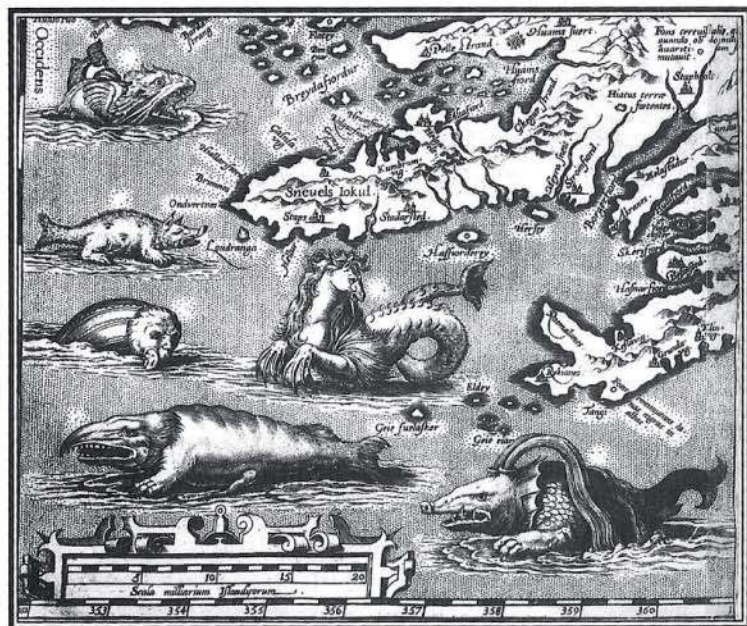


## WRITING TASK 1

To be answered in the answer book in pen, not pencil.  
You are advised to allocate 30 minutes to this task.

Consider the information on these two pages.  
Develop a piece of writing presenting the main information in the material.  
You should **not** present an argument.  
Your piece will be judged on:

- how well you organise and present your understanding of the material,
- your ability to communicate the information effectively, and
- how clearly you express yourself.



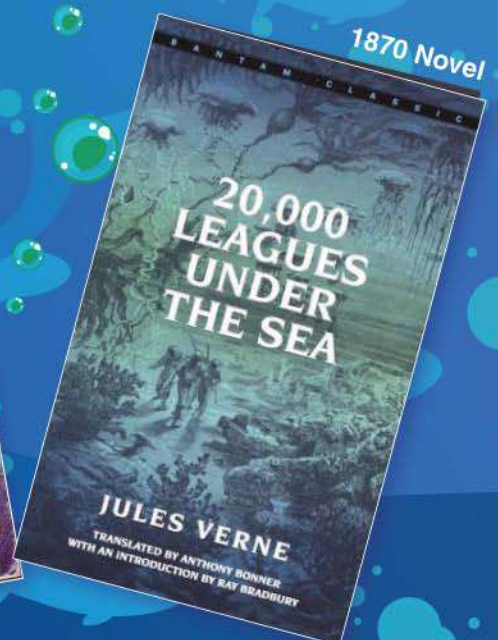
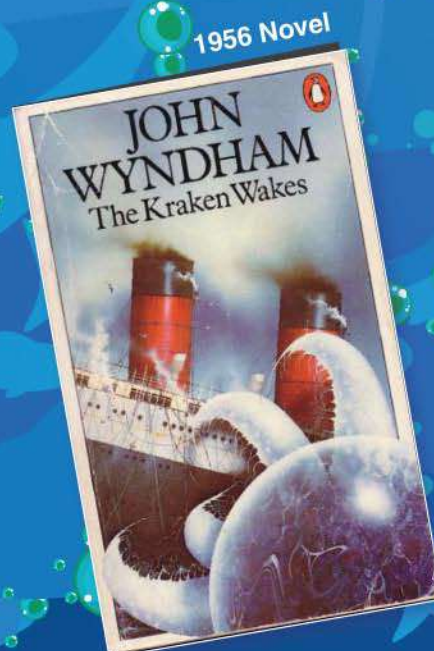
Abraham Ortelius, *Theatrum Orbis Terrarum* 1570,  
Artist's impression, Ocean off the coast of Iceland

## Ocean Exploration Timeline

1872–1876	Challenger Expedition: first systematic worldwide oceanographic survey
1934	First 'bathysphere' – W. Beebe and O. Barton descend to a depth of 800 m in a tethered sphere
1951	Challenger II discovered the deepest trench - the Mariana Trench
1960	The Trieste, improved untethered bathysphere, used to explore down to 10 916 m depth
1964	The piloted deep-sea submersible ALVIN (HOV) able to roam the deep sea
1990s	TOBI (Towed Ocean Bottom Instrument) developed with multiple sensors. Satellite data and echo-sounding data are combined to produce detailed bathymetric images
2000s	Deep-sea craft developed. Operated via the internet



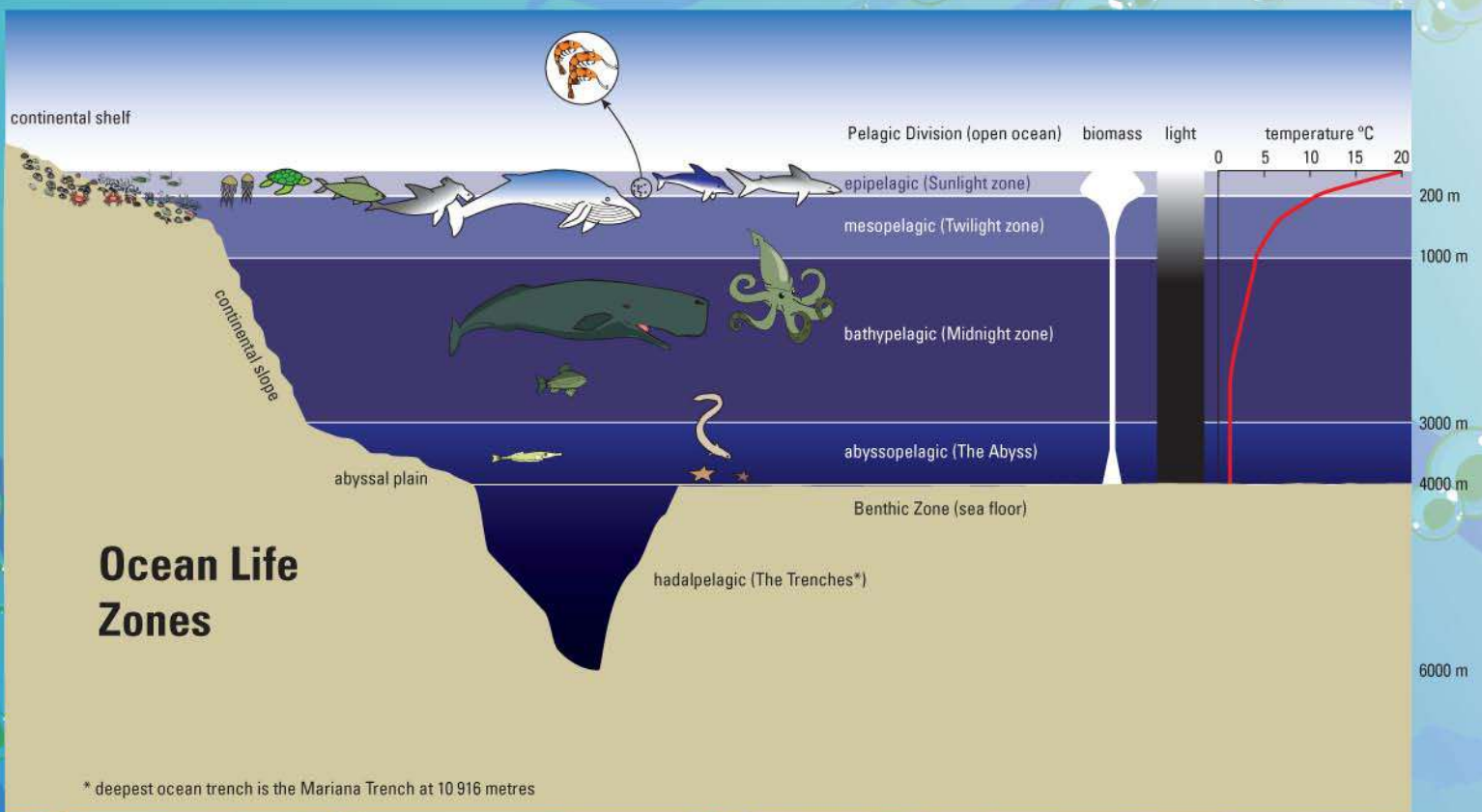
Angler Fish photograph 1998  
(Benthic Zone)





Environment of the sea below 500 m	Adaptations of sea creatures below 500 m	Purpose of adaptation below 500 m
Twilight zone into darkness	Bioluminescence – ability to produce light	Attract mate, obtain food
	Large eyes	Escape predators
	Transparency Black or dark colour	Camouflage
Limited food sources (biomass*)	Huge mouth, jaws that unhinge, large sharp teeth	Catch food
Extreme water pressure	Reduced or no swim bladders, bodies without air cavities	Withstand water pressure
Limited oxygen	Slow metabolism	Conserve energy
Temperature decreasing to 1°C or less		

\* biomass: the total mass of living matter in a given unit area



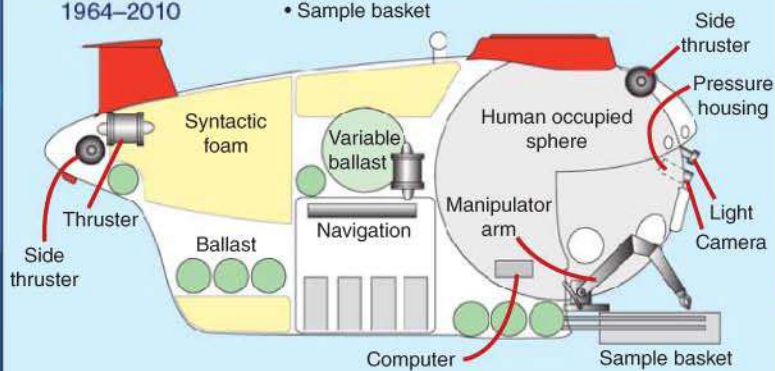
### HOV Human Occupied Vehicle 1964–2010

**Does not have:**

- Tether

**Has:**

- Thrusters
- Batteries
- Navigation
- Onboard computer
- Sample basket
- Manipulator arm
- Cameras
- Personnel sphere
- Variable ballast



### Bathysphere 1934



**WRITING TASK 2**

*To be answered in the answer book in pen, not pencil.  
You are advised to allocate 30 minutes to this task.*

Consider the statements below.

Based on **one** or **more** of the statements, develop a piece of writing presenting your point of view.

Your piece of writing will be judged on:

- the extent to which you develop your point of view in a reasonable and convincing way
- how effectively you express yourself.

Cities represent the lowest point of human development – they are soulless, crowded and often overwhelming.

In order to reap the benefits of lively and dynamic city living, we have to accept the freeways, traffic, crowds and chaos of cities.

Cities are only as good as their particular surrounds – the bush, the beach, the mountains make them what they are.

A vibrant city represents hope, pride, creativity and a sense of community.

**MULTIPLE-CHOICE QUESTIONS**

*Answer this section in the GAT ANSWER BOOK.  
Mark your answers on the Multiple-Choice Answer Page.*

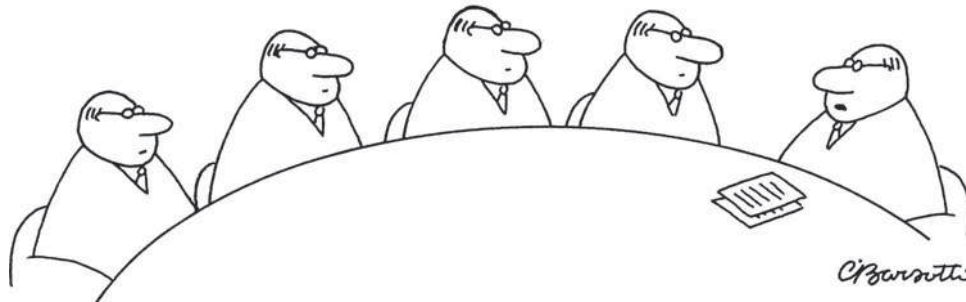
*You are advised to allocate 2 hours to this task.*

Choose the response that is **correct**, or that **best answers the question**, and shade the square on the answer page for multiple-choice questions according to the instructions on that page.

A correct answer is worth 1 mark, an incorrect answer is worth 0 marks. No marks will be given if more than one answer is shown for any question. Marks will **not** be deducted for incorrect answers.

## UNIT 1

## Question 1



*“Does everybody know everybody?”*

- 1 The cartoon is best described as a comment on
- |                                    |               |
|------------------------------------|---------------|
| A the difficulty of introductions. | C anonymity.  |
| B regulations.                     | D uniformity. |

## UNIT 2

## Questions 2 and 3

*The passage below is the beginning of a short story.*

Besides the neutral expression that she wore when she was alone, Mrs Freeman had two others, forward and reverse, that she used for all her human dealings. Her forward expression was steady and driving like the advance of a heavy truck. Her eyes never swerved to left or right but turned as the story turned as if they followed a yellow line down the centre of it. She seldom used the other expression because it was not often necessary for her to retract a statement, but when she did, her face came to a complete stop, there was an almost imperceptible movement of her black eyes, during which they seemed to be receding, and then the observer would see that Mrs Freeman, though she might stand there as real as several grain sacks thrown on top of each other, was no longer there in spirit.

5




10

- 2 The description suggests that Mrs Freeman hardly ever
- |                    |                                 |
|--------------------|---------------------------------|
| A admitted defeat. | C thought of herself.           |
| B won an argument. | D kept to her line of argument. |
- 3 The passage gives the impression that Mrs Freeman was
- |                         |                               |
|-------------------------|-------------------------------|
| A crude and unsubtle.   | C enthusiastic but misguided. |
| B lazy and complaining. | D strong-minded but gracious. |

### UNIT 3

#### Questions 4 – 6

The table shows the purchase cost, expected lifespan, electrical efficiency and cost of electricity of incandescent, CFL and LED lights providing the same amount of light as a 75 watt (W) incandescent globe.

	Incandescent	Compact fluorescent (CFL)	Light-emitting diode (LED)
			
<b>Purchase cost</b>	\$1.00	\$4.00	\$40.00
<b>Lifespan</b>	1000 hours	10 000 hours	50 000 hours
<b>Electrical efficiency</b>	5%	25%	50%
<b>Cost of electricity per 100 hours use</b>	\$1.00	\$0.20	\$0.10

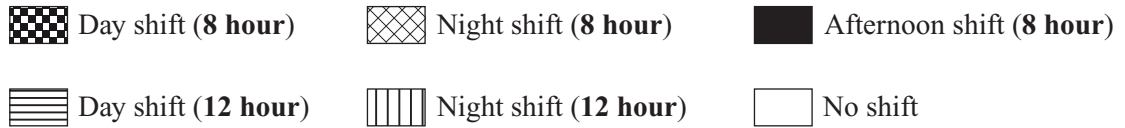
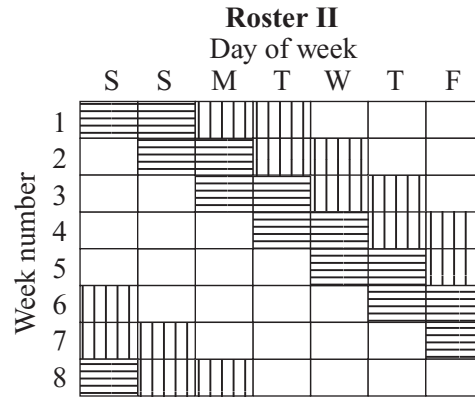
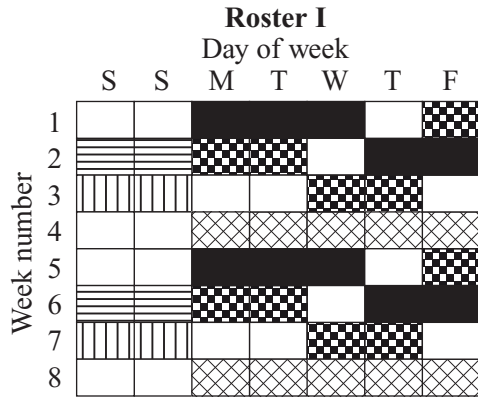
- 1000 hours is about 40 days continuous use.
- Electrical efficiency is the proportion of electrical energy that is converted to light energy.

- 4 As electrical efficiency increases,
- A lifespan decreases.
  - B purchase cost decreases.
  - C cost of electricity use decreases.
  - D amount of light produced increases.
- 5 Which of the following is closest to the expected number of days of continuous use for an LED?
- A 200 days
  - B 400 days
  - C 2000 days
  - D 4000 days
- 6 Compared to operating a CFL, how much more would it cost to operate an incandescent globe for 1000 hours?
- A \$2
  - B \$5
  - C \$8
  - D \$10

**UNIT 4**

**Questions 7 – 9**

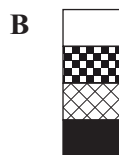
Bob works for a company that operates 24 hours per day. He currently works according to Roster I. The company is about to introduce a new roster, Roster II.



Assume:

- a week starts on Saturday and ends on Friday
- the rosters repeat according to the same patterns after week 8.

7 Which of the following shows Roster I on Wednesdays for weeks 19–22?







## UNIT 6

### Questions 11 and 12

The image on the screen of a digital camera is produced by arrays of tiny units, called pixels, each of which produces light of a particular colour when activated. In a typical digital camera, each pixel produces light of one of three colours — green, red or blue. If in one area only green pixels are activated, then that part of the image will appear green.

In the  $5 \times 5$  array of pixels from a particular screen illustrated in the figure:

G1	R2	G3	R4	G5
B6	G7	B8	G9	B10
G11	R12	G13	R14	G15
B16	G17	B18	G19	B20
G21	R22	G23	R24	G25

- G pixels produce green light
- B pixels produce blue light
- R pixels produce red light.

The pattern indicated by the  $5 \times 5$  array of pixels continues left and right, up and down, outside the area shown.

- The following questions refer to arrays from this screen, which consists of thousands of tiny pixels.

**11** In any  $3 \times 3$  square section of the array in the figure (containing nine complete pixels) there

- A will always be four green pixels.
- B will always be five green pixels.
- C may be four or five green pixels.
- D may be less than four or more than five green pixels.

**12** For a  $6 \times 6$  array from the screen, the number of green pixels

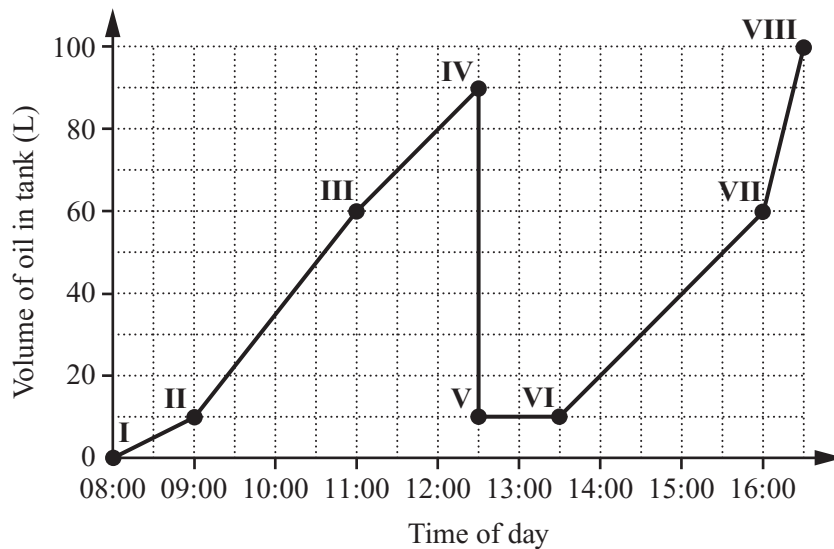
- A equals the number of red pixels and blue pixels added together.
- B is less than the number of red pixels and blue pixels added together.
- C is more than the number of red pixels and blue pixels added together.
- D may be more or less than the number of red pixels and blue pixels added together.

## UNIT 7

## Questions 13 – 15

A press is used to extract oil from olives. As the oil is produced it collects in a 100 L tank. Periodically, the oil is poured out and taken away for bottling.

The graph shows the changes in the volume of oil in the tank during one day. The numbers (I–VIII) indicate the times during the day when there is a change in the rate of oil production.



13 Which of the following would best explain what was happening between times V and VI?

- A The tank was being rapidly emptied.
- B The tank was rapidly filling with oil.
- C Oil was being produced at a constant rate.
- D The press was switched off and no oil was being produced.

14 Which of the following is the rate of oil production between times II and III?

- A 20 L/h
- B 25 L/h
- C 30 L/h
- D 50 L/h

15 On the day shown, how much oil was produced between 08:00 and 16:30?

- A 90 L
- B 100 L
- C 180 L
- D 190 L

## UNIT 8

### Questions 16 – 19

*Below are six quotations about freedom/liberty.*

#### I

Those who profess to favour freedom, and yet deprecate agitation, are men who want rain without thunder and lightning.

*Frederick Douglass*

#### II

Democracy is two wolves and a lamb voting on what to have for lunch. Liberty is a well-armed lamb contesting the vote!

*Benjamin Franklin*

#### III

In my youth, I stressed freedom, and in my old age I stress order. I have made the great discovery that liberty is a product of order.

*Will Durant*

#### IV

Money for me has only one sound: liberty.

*Gabrielle Chanel*

#### V

The advancement and diffusion of knowledge is the only guardian of true liberty.

*James Madison*

#### VI

Conformity is the jailer of freedom and the enemy of growth.

*John Fitzgerald Kennedy*

### 16 Quotations I and II

- A agree that peace is more important than liberty.
- B disagree about the need to defend liberty at any cost.
- C disagree about the methods needed to secure liberty for all.
- D agree that the use of force is justified in the defence of liberty.

### 17 Which of the following pairs suggests that individual thought is likely to encourage liberty?

- A Quotations I and II
- B Quotations II and III
- C Quotations III and IV
- D Quotations V and VI

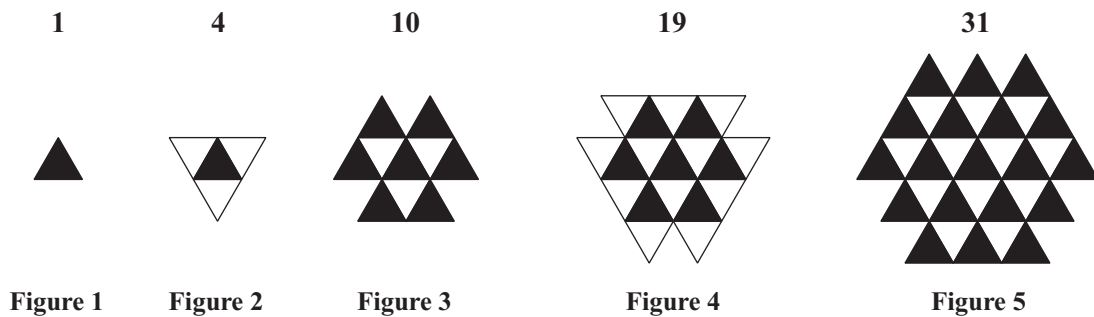


- 18 Which of the following would most strongly **agree** that the rule of law is the best guarantee of freedom?
- A Quotation II  
 B Quotation III  
 C Quotation IV  
 D Quotation V
- 19 Which of the following pairs would most strongly **disagree** about the best way to secure freedom?
- A Quotations I and II  
 B Quotations I and III  
 C Quotations I and VI  
 D Quotations V and VI

## UNIT 9

### Questions 20 and 21

Starting at Figure 1, each subsequent figure is formed by adding an increasing number of small black or white triangles to the previous figure according to a rule. The total number of small triangles in each figure is given above the figure. Additional figures can be produced using the same rule.



- 20 How many small triangles would be added to **Figure 6** to produce **Figure 7**?
- A 24  
 B 21  
 C 18  
 D 15
- 21 The number of small triangles added to **Figure**  $(n - 1)$  to form **Figure**  $n$  is given by
- A  $3n$   
 B  $3n - 1$   
 C  $3n + 1$   
 D  $3(n - 1)$

## UNIT 10

### Questions 22 – 25

The following passages are taken from a book about popular culture. Passage I discusses 'designer' jeans as opposed to 'generic' (cheap and mass produced) jeans and Passage II is about ripped or ragged jeans.

#### Passage I

Wearing designer jeans is an act of distinction, of using a socially locatable accent to speak a common language. It is a move upscale socially, to the city and its sophistication, to the trendy and the socially distinctive. The opposition between generic jeans and designer jeans can be summarised like this:

Generic Jeans	Designer Jeans
classless	upscale
country	city
communal, unisex	socially distinctive, feminine (or rarely masculine)
work	leisure
traditional	contemporary
unchanging	transient
nature	culture

#### Passage II

More significant than any other possible meaning for ragged jeans is the fact that the raggedness is the production and choice of the user, it is an excorporation<sup>1</sup> of the commodity into a subordinate subculture ... It is a refusal of commodification<sup>2</sup> and an assertion of one's right to make one's own culture out of the resources provided by the commodity system.

5

Manufacturers quickly exploited the popularity of ragged (or old and faded) jeans by producing factory-made tears, or by washing or fading jeans in the factory before sale. This process of adopting the signs of resistance incorporated them into the dominant system and thus attempts to rob them of any oppositional meanings.

<sup>1</sup>*excorporation*: the process by which a subordinate subculture makes its own culture out of the resources and commodities provided by the dominant system

<sup>2</sup>*commodification*: to make something into a commodity, sometimes at the expense of its intrinsic value

22 Passages I and II suggest that jeans

- A make a statement about the wearer.
- B are little more than a commodity.
- C are culturally neutral.
- D have intrinsic value.

- 23 According to Passage I, the fundamental difference between generic jeans and designer jeans is
- A cost.
  - B style.
  - C appeal.
  - D meaning.
- 24 According to Passage II, ‘ragged jeans’ (line 1) initially represented
- A a destructive urge.
  - B an act of rebellion.
  - C an effort to conform.
  - D a fashionable flourish.
- 25 In Passage II, factory-made ‘ragged jeans’ are robbed of ‘any oppositional meanings’ (line 9) because they
- A lack stylishness and flair.
  - B have become another commodity.
  - C express the individuality of the wearer.
  - D represent the subordinate subculture of the wearer.

**UNIT 11**

**Questions 26 – 29**

Max is trying to separate a mixture containing five solids. The table shows whether each solid in the mixture is soluble in the following solvents: ether, alcohol or acetone.

	<b>soluble in ether</b>	<b>soluble in alcohol</b>	<b>soluble in acetone</b>
<b>Solid 1</b>	yes	yes	no
<b>Solid 2</b>	no	yes	no
<b>Solid 3</b>	no	yes	yes
<b>Solid 4</b>	yes	no	no
<b>Solid 5</b>	yes	no	yes

**26 Solid 3** is soluble in

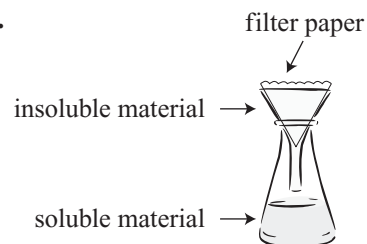
- A** alcohol but not ether or acetone.
- B** ether but not alcohol or acetone.
- C** both ether and acetone but not alcohol.
- D** both alcohol and acetone but not ether.

**27** Ether will

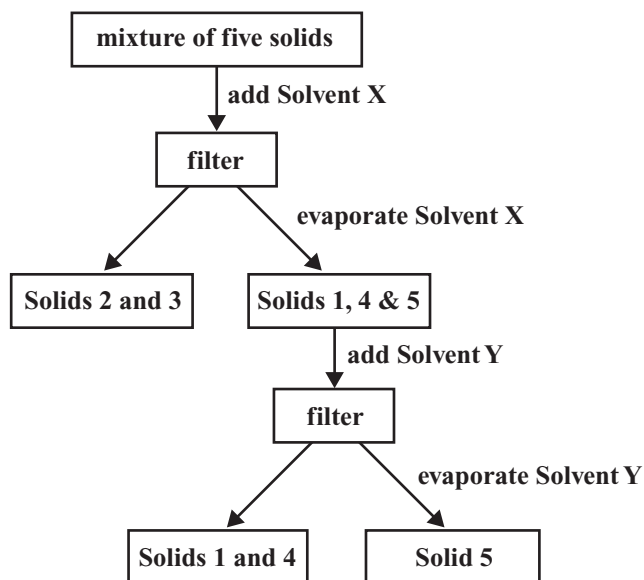
- A** only dissolve **Solid 1**.
- B** only dissolve **Solid 3**.
- C** dissolve **Solids 1, 4 and 5**.
- D** dissolve **Solids 2 and 3**.

**Questions 28 and 29 refer to the following additional information.**

In trying to separate the five solids in the mixture, Max adds a solvent to the mixture. He then passes the mixture through filter paper to separate the soluble from insoluble material. Insoluble material does not pass through the filter paper and is left behind in it, while soluble material passes through the filter paper. Solids can be obtained from the soluble material that passes through the filter paper by evaporating the solvent to leave the solid.



**28** Suppose Max used this procedure and got the results indicated.



What are **Solvents X** and **Y**?

- |          | <b>Solvent X</b> | <b>Solvent Y</b> |
|----------|------------------|------------------|
| <b>A</b> | ether            | alcohol          |
| <b>B</b> | alcohol          | ether            |
| <b>C</b> | ether            | acetone          |
| <b>D</b> | acetone          | ether            |

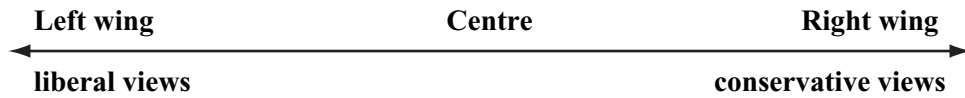




**UNIT 13**

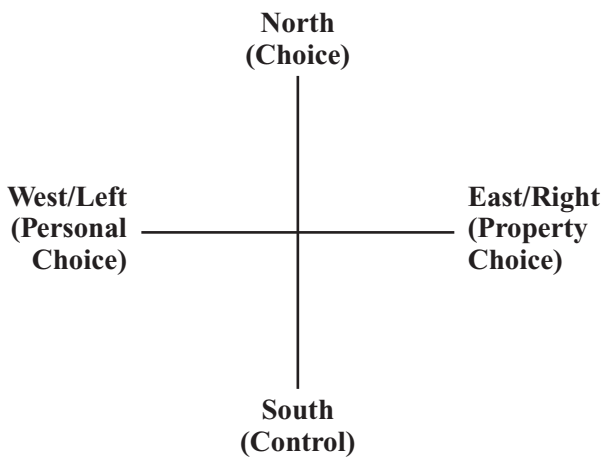
**Questions 33 – 36**

The relationship between different political groups is often represented as a spectrum from left to right, as in Figure 1.

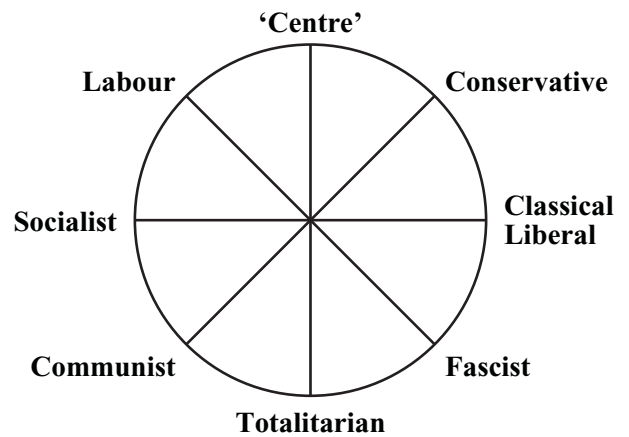


**Figure 1** The usual political spectrum

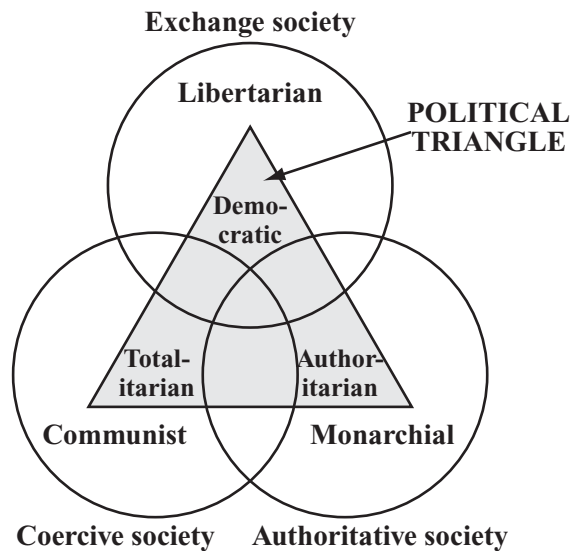
Figure 2 presents political groups as a kind of two-dimensional map with left and right crossed by choice and control. Figure 3 presents political groups as segments of a circle. Figure 4 presents kinds of society and governing regimes as a political triangle.



**Figure 2** A political map



**Figure 3** The political circle



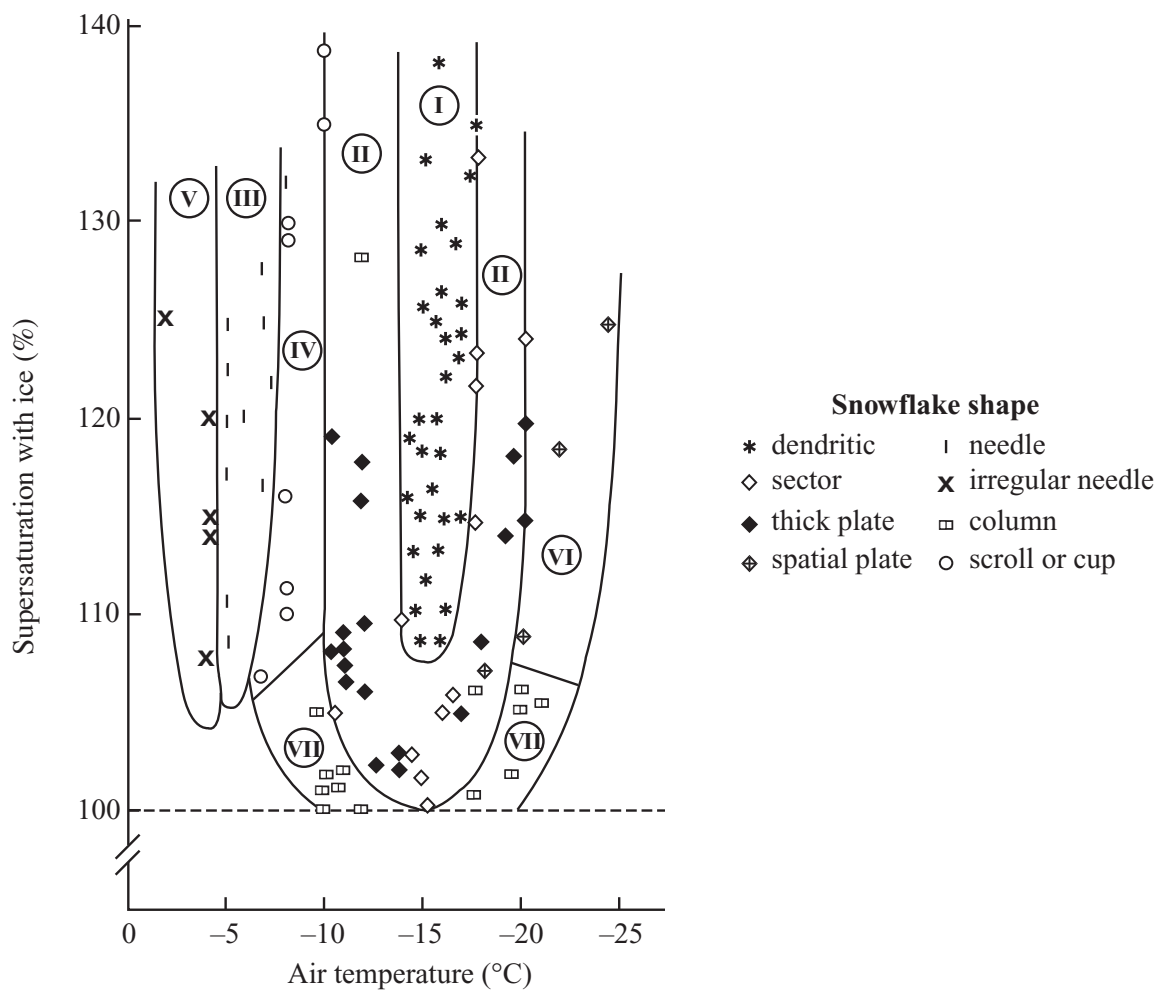
**Figure 4** The political triangle and associated societies and political regimes

- 33 Figure 3 shows that there is
- A fascism of the left and right.
  - B communism of the left and right.
  - C conservatism of the left and right.
  - D totalitarianism of the left and right.
- 34 The Centre in Figure 1 is
- A the top of Figure 3.
  - B the middle of Figure 3.
  - C the bottom of Figure 3.
  - D not in Figure 3.
- 35 In terms of Figure 2, the Totalitarian in Figure 3 would be
- A North.
  - B South.
  - C East.
  - D West.
- 36 In terms of Figure 2, the Exchange society in Figure 4 would be closest to
- A North.
  - B South.
  - C East.
  - D West.

## UNIT 14

## Questions 37 – 39

Snowflake shape depends on the air temperature and the *supersaturation*<sup>1</sup> of the air with ice. Such information is summarised in the figure.



(Reprinted by permission of the publisher from *Snow Crystals: Natural And Artificial* by Ukichiro Nakaya, p. 246, Cambridge Mass.: Harvard University Press, © 1954 by the President and Fellows of Harvard College.)

The lines in the figure indicate regions (labelled I to VII) representing conditions under which particular types of snowflake are likely to form. For example, region I indicates the conditions for the formation of dendritic flakes (and some sector flakes).

<sup>1</sup> In this case, supersaturation refers to increasing the level of ice in the air above the normal maximum level.



37 Which of the following statements is most accurate?

Scrolls or cups can form at any temperature between

- A  $-25^{\circ}\text{C}$  and  $-11^{\circ}\text{C}$ .
- B  $-19^{\circ}\text{C}$  and  $-9^{\circ}\text{C}$ .
- C  $-11^{\circ}\text{C}$  and  $-7^{\circ}\text{C}$ .
- D  $-10^{\circ}\text{C}$  and  $0^{\circ}\text{C}$ .

38 Which one of the following types of snowflake forms across the greatest temperature range?

- A column
- B sector
- C dendritic
- D thick plate

39 Suppose snowflakes are growing at a temperature of  $-6^{\circ}\text{C}$  and a supersaturation level of 110%. The temperature suddenly drops to  $-13^{\circ}\text{C}$ .

Of the following, the most likely shape of the resultant snowflakes is

- A a needle with scrolls growing from it.
- B an irregular needle with dendrites growing from it.
- C a needle with sectors or thick plates growing from it.
- D an irregular needle with sectors or thick plates growing from it.

## UNIT 15

### Questions 40 – 43

*The passage below is from a novel set in the early twentieth century on a Caribbean island. The narrator, José, who comes from a very poor background, has won a scholarship to a prestigious school. Each day during breaks between classes he is confronted by the sight of other students buying and eating food that he cannot afford.*

My affliction was then so acute that it was not my stomach that caused me pain, but a bewildering emptiness, making my head grow heavy, transforming all around me into a nightmare, into an ignoble plot against my hunger.

Thus, I began filling myself with water from a tap in a corner of the yard and every now and then, I returned to it, trying to drown my stomach to keep it quiet. 5  
Similarly, I tried to hide myself in the crowd to escape Bussi. I had neither the urge nor the strength to talk. It was already quite a problem looking calm, indifferent, even filled, like everybody else. But Bussi managed to find me. I saw him; he had seen me; impossible to get away. He came up to me, holding a long piece of golden brown bread, its white foam-light inside cut in two to receive fried eggs. I found it terrible. 10

But Bussi was a kind friend. Seeing that I hadn't had anything to eat, he offered me his bread in a natural gesture.

'Break it.'

'No,' I said, 'thank you.'

'Come on, break it with me.' 15

He held out his bread to me. That golden brown and white bread, spongy and stuffed full of fried eggs, smelling good.

No, I was adamant in my refusal, and with an air of indifference; for, at his insistence, my hunger had disappeared, overcome or driven back by some indescribable pride risen up in the face of what could be a gesture of pity on the part of this boy. But he broke the bread himself and handed me a piece, a large piece, all full of egg yolks. 20

'Come now, don't make such a fuss.'

I put both my hands behind my back and with a quiet smile, I persisted with my refusal. 25

Then, to end it all, Bussi shrugged his shoulders, did a little pirouette, bit deep into his bread and we spoke about other things. We walked about the yard. The walk relaxed me from the struggle I had just been through.

40 José's main purpose in lines 4–7 seems to have been to

- A alienate Bussi.
- B satisfy his hunger pangs.
- C emphasise his isolation from others.
- D keep his problem from being noticed.

- 41 José's reaction to Bussi's offer demonstrates his
- A self-respect.
  - B self-importance.
  - C distaste for Bussi's off-handedness.
  - D suspicion that Bussi has a selfish motive.
- 42 The fact that José's 'hunger had disappeared' (line 19) is a result of
- A a change in his emotional state.
  - B a desperate attempt to hide his desire.
  - C trying to disguise his contempt for the offer.
  - D trying to conceal his gratitude for the offer.
- 43 When José refuses the bread (lines 23–27), Bussi shows
- A relief.
  - B confusion.
  - C insincerity.
  - D understanding.

## UNIT 16

## Questions 44 – 47

$$\text{Let} \quad h \clubsuit g = h + \frac{1}{g}$$

$$\text{and} \quad h \heartsuit g = g + \frac{1}{h}$$

where  $h$  and  $g$  are positive whole numbers or positive fractions.

44 When  $h = 2$  and  $g = 1$ , what is the value of  $h \clubsuit g$ ?

A  $1\frac{1}{2}$

C  $2\frac{1}{2}$

B 2

D 3

45 Which one of the following is true when  $h = 3$  and  $g = 2$ ?

A  $h \clubsuit g = 3\frac{1}{3}$

C  $h \clubsuit g = 2\frac{1}{2}$

B  $h \heartsuit g = 3\frac{1}{2}$

D  $h \heartsuit g = 2\frac{1}{3}$

46 What is the value of  $5 \heartsuit 10$ ?

A 15.2

C 5.1

B 10.2

D 0.5

47 What value of  $g$  makes  $4 \clubsuit g = 100$ ?

A  $\frac{1}{96}$

C 25

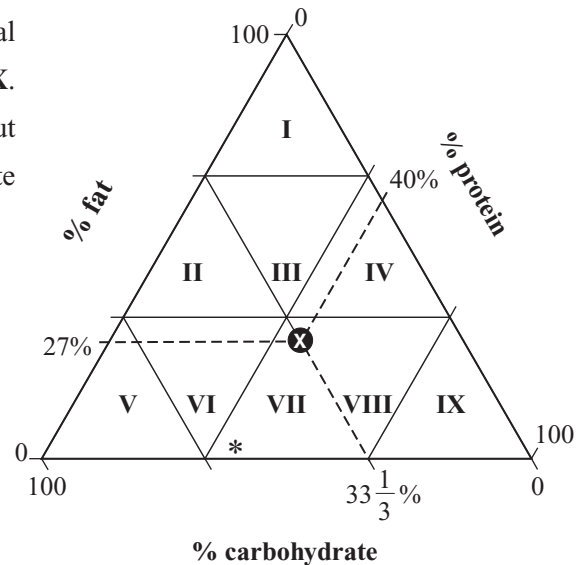
B  $\frac{1}{25}$

D 96

## UNIT 17

## Questions 48 – 51

This food matrix classifies food according to its relative fat, carbohydrate and protein content. The food matrix can be divided into nine identical equilateral triangles, labelled as regions I–IX. The figure indicates that food **X** consists of about 27% fat, 40% protein and  $33\frac{1}{3}\%$  carbohydrate (by mass).



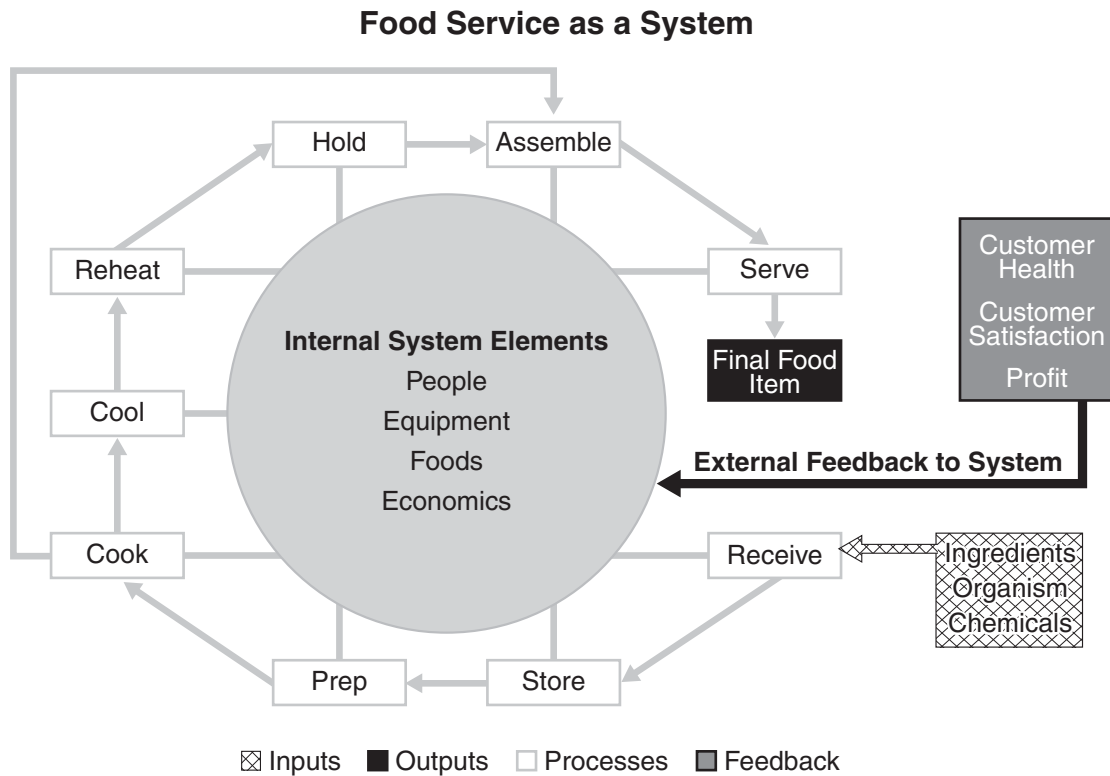
**Note:** In the figure, \* represents spinach.

- 48 A food consisting of 60% carbohydrate, 25% protein and 15% fat would be in region
- A II.  
B III.  
C V.  
D VI.
- 49 Foods from regions I and V can have the same percentage of
- A fat only.  
B protein only.  
C carbohydrate only.  
D fat, carbohydrate and protein.
- 50 In which of the following regions would a food with a ratio of fat to protein to carbohydrate of 1 : 1 : 2 be represented?
- A region II  
B region III  
C region VI  
D region VII
- 51 A food with the same percentage of fat as spinach, but half the percentage of protein, would be represented in region
- A II.  
B V.  
C VI.  
D VIII.

## UNIT 18

## Questions 52 – 54

Recently, a number of guests at a large hotel fell ill from food poisoning. An environmental investigation revealed food-handling practices, food handler perceptions, and hotel policies contributed to the illness outbreak. The diagram below was created in response to this event.



- 52 If placed on the diagram, the term 'hotel policies' would most likely be located in the section marked as
- 'Inputs'.
  - 'Outputs'.
  - 'Internal System Elements'.
  - 'External Feedback to System'.
- 53 The elements of the diagram marked 'Processes'
- are a subset of the 'Internal System Elements'.
  - constitute the entire 'Internal System Elements'.
  - are a distinct system from the 'Internal System Elements'.
  - contain within them the subset 'Internal System Elements'.
- 54 The diagram is primarily designed to show that when it comes to disease prevention
- 'Feedback' is fundamental.
  - 'Internal System Elements' are central.
  - 'Internal System Elements' are secondary to 'Inputs'.
  - 'Final Food Item(s)' are secondary to 'External Feedback'.

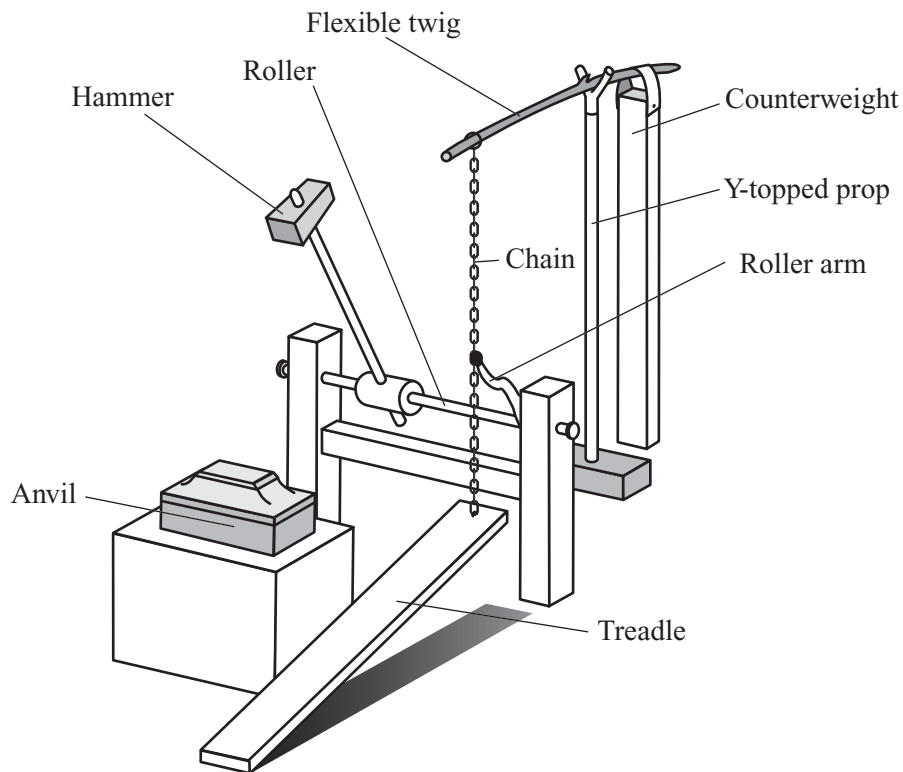


## UNIT 19

### Questions 55 and 56

The figure shows a working model of a foot-operated treadle hammer used by blacksmiths about 500 years ago. Objects to be struck by the hammer are placed on the anvil. The hammer is shown in the start position of a strike.

**Note:** The chain is fixed firmly to the Roller arm, which is fixed firmly to the Roller.



- 55 The main purpose of the counterweight is to
- A help lower the hammer.
  - B stop the machine falling forward.
  - C keep upward tension on the chain.
  - D stop the treadle from hitting the floor.
- 56 Suppose the hammer failed to strike when the blacksmith operated the machine. Which of the following is most likely to have caused this problem?
- A a broken twig
  - B the counterweight has fallen from the twig
  - C a broken chain between the roller arm and the twig
  - D a broken chain between the treadle and the roller arm

## UNIT 20

### Questions 57 and 58

Listening to loud music or being exposed to loud sounds for extended periods of time can damage a person's hearing. A set of guidelines for allowable (safe) daily sound exposure in terms of sound duration and sound level is shown in the table. For example, the guidelines indicate that it is not safe to be exposed to more than 8 hours of sound at 90 decibels in one day.

Allowable daily sound exposure	
Sound duration, $T$ (hours)	Sound level (decibels)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

For exposure to sound of a particular level for part of a day, an *exposure fraction* can be determined. This is given by  $\frac{C}{T}$ , where  $C$  is the exposure time (hours) and  $T$  is the duration (hours) allowed at the specified sound level. For example, if a person was exposed to 4 hours of sound at 90 decibels, the exposure fraction would be  $\frac{4}{8}$ .

If a person is exposed to more than one sound level in a day, the individual exposure fractions are added, as shown by the following equation:

$$\text{total exposure fraction} = \frac{C_1}{T_1} + \frac{C_2}{T_2} + \frac{C_3}{T_3} + \dots$$

where

- $C_1$  is the exposure time at the first sound level,  $C_2$  is the exposure time at the second sound level, and so on; and
- $T_1$  is the duration allowed at the first sound level,  $T_2$  is the duration allowed at the second sound level, and so on.

**Note:**

- The total exposure fraction for a day must **not** exceed 1.
- Assume that the sound levels given in each question are the only sound exposures for that particular day.
- Answer the following questions just according to the information provided.

57 Which of the following shows the total exposure fraction for a person exposed to 2 hours of sound at 92 decibels plus one hour of sound at 95 decibels?

A  $\frac{1}{92} + \frac{2}{95}$

B  $\frac{2}{92} + \frac{1}{95}$

C  $\frac{1}{6} + \frac{2}{4}$

D  $\frac{2}{6} + \frac{1}{4}$

58 John is exposed to 6 hours of sound at 90 decibels.

What is the maximum number of hours of sound at 95 decibels to which John could be safely exposed on the same day?

- A none
- B one hour
- C two hours
- D more than two hours

## UNIT 21

### Questions 59 – 62

*The following passage describes an urban myth.*

New York has the number one scare story of all big cities. It is the story of the alligators in the sewers, a well known urban myth. It tells us everything we need to know about our attitudes toward cities. The premise is based on fact: in the early 1950s carnivals in Florida sold baby alligators as novelties in small boxes with cellophane windows and air holes. The boxes with the novel prize inside were highly prized by the children who possessed them. At least until they returned home and eventually grew disenchanted with the growing creatures. For city children, like those from New York who vacationed in Florida, this provided a special predicament. Ultimately, they disposed of them in traditional New York City fashion, flushing them down the toilet. What happened, naturally, or at least according to myth, was that the alligators took to the dark and dank of New York’s underworld in a way that could never have been foreseen, growing in size to monstrous proportion as they stalked the depths of the city’s water system, serpentine tails flapping mightily, eyes peering prehistorically through the gathering gloom. 5

The alligator is a proper New York City demon. It is a good myth. A good urban story that is as fanciful as it is fearsome. It is a story that we enjoy telling ourselves whether we believe it is true or not. We take pleasure from it because it expresses our attitude about New York, and big cities in general. More than an urban myth, it is a fable that resonates with the force of a proverb, a classic tale of a descent into the underworld that instructs us about good and evil. 10

The alligator story relies on the conjecture that to live in a big city is to be subject to the unintentional acts of others. This may be a foundational fear of big cities, particularly to those who do not reside there, that so many people in a small area leads to chaos, to unpredictable dangers that cannot be controlled or prevented. The city is thus imagined to occasion a state of personal vulnerability. 15

**59** According to the writer, the alligator story is a ‘good myth’ (line 15) because

- A** it expresses fear.
- B** good triumphs over evil.
- C** evil triumphs over good.
- D** it offers an escape from reality.

- 60 The writer sees the alligator story as
- A escapist.
  - B a fantasy.
  - C symbolic.
  - D a distraction.
- 61 The writer suggests that urban myths are
- A quite unlike other myths.
  - B distinctive in some respects.
  - C too diverse to generalise about.
  - D indistinguishable from other myths.
- 62 The writer states that the alligator story is ‘more than an urban myth, it is a fable’ (lines 18 and 19).
- The story is a fable rather than a myth in that it
- A is fiction rather than fact.
  - B is fact rather than fiction.
  - C has a moral.
  - D tells a story.

## UNIT 22

### Questions 63 – 66

*Bowler hats feature in both the following poem and the painting. They were commonly worn by office workers and businessmen in England in the nineteenth and twentieth centuries.*

#### The Man in the Bowler Hat

I am the unnoticed, the unnoticeable man:  
 The man who sat on your right in the morning train:  
 The man you looked through like a windowpane:  
 The man who was the colour of the carriage, the colour  
 of the mounting 5  
 Morning pipe smoke.

I am the man too busy with a living to live,  
 Too hurried and worried to see and smell and touch:  
 The man who is patient too long and obeys too much  
 And wishes too softly and seldom. 10

I am the man they call the nation's backbone,  
 Who am boneless – playable catgut<sup>1</sup>, pliable clay:  
 The Man they label Little lest one day  
 I dare to grow.

I am the rails on which the moment passes, 15  
 The megaphone for many words and voices:  
 I am graph, diagram,  
 Composite face.

I am the led, the easily-fed, 20  
 The tool, the not-quite-fool,  
 The would-be-safe-and-sound,  
 The uncomplaining bound,  
 The dust fine-ground,  
 Stone-for-a-statue waveworn pebble-round.

*A.S.J. Tessimond*

<sup>1</sup>*catgut*: material used for the strings of musical instruments

**Questions 63 – 65 concern the poem ‘The Man in the Bowler Hat’.**

**63** Line 2 suggests the

- A speaker's quiet dignity.
- B speaker's sheer ordinariness.
- C neglect suffered by the speaker.
- D speaker's desire to make himself invisible.





*René Magritte, Golconda, 1953*

- 64 The poem implies that the ‘they’ referred to in lines 11 and 13
- A gain strength from the compliance of those like the speaker.
  - B become powerful from the ambition and drive of those like the speaker.
  - C get their authority from the personal development of those like the speaker.
  - D are willing to do their share for the nation, as distinct from those like the speaker.
- 65 Lines 15–18 emphasise the speaker’s
- A courageousness.
  - B multiple abilities.
  - C passive anonymity.
  - D ability to direct others.

**Question 66 concerns both the poem and the painting.**

- 66 Which of the following pairs best describes the poem and the painting?

	<b>The poem</b>	<b>The painting</b>
A	makes unreality absurd.	makes absurdity unreal.
B	shows the normal as powerless.	shows the normal as fantastic.
C	urges the acceptance of limitations.	urges the testing of limitations.
D	suggests that wretchedness is unavoidable.	shows how to avoid wretchedness.

## UNIT 23

### Questions 67 – 69

Table 1 gives the number of people per car and the number of cars per kilometre of road in eight countries in 1992.

**Table 1**

Country	People per car	Cars per kilometre
Australia	1.8	10.6
China	2022	0.3
India	515	1.1
Japan	4.3	43
Russia	24	15
South Africa	112	1.6
United Kingdom	2.8	62
USA	1.8	27

- 67 Suppose car owners in all countries drove their cars for an equal number of hours per week and all cars produced an equal amount of pollution per hour of use.

Of the following, which country would have produced the **least** car pollution per person in 1992?

- A USA  
 B Russia  
 C South Africa  
 D United Kingdom

- 68 The data indicate that

- A compared with India, there were more cars per kilometre of road in Australia.  
 B car owners in the USA drove twice as many kilometres as car owners in Australia.  
 C compared with Russia, a greater number of people in China had their own car.  
 D cars on the road in China carried more passengers than cars on the road in the United Kingdom.

- 69 Table 2 gives the 1992 population of the eight countries.

**Table 2**

Country	Australia	China	India	Japan	Russia	South Africa	United Kingdom	USA
Population (millions)	17	1100	850	124	290	36	58	250

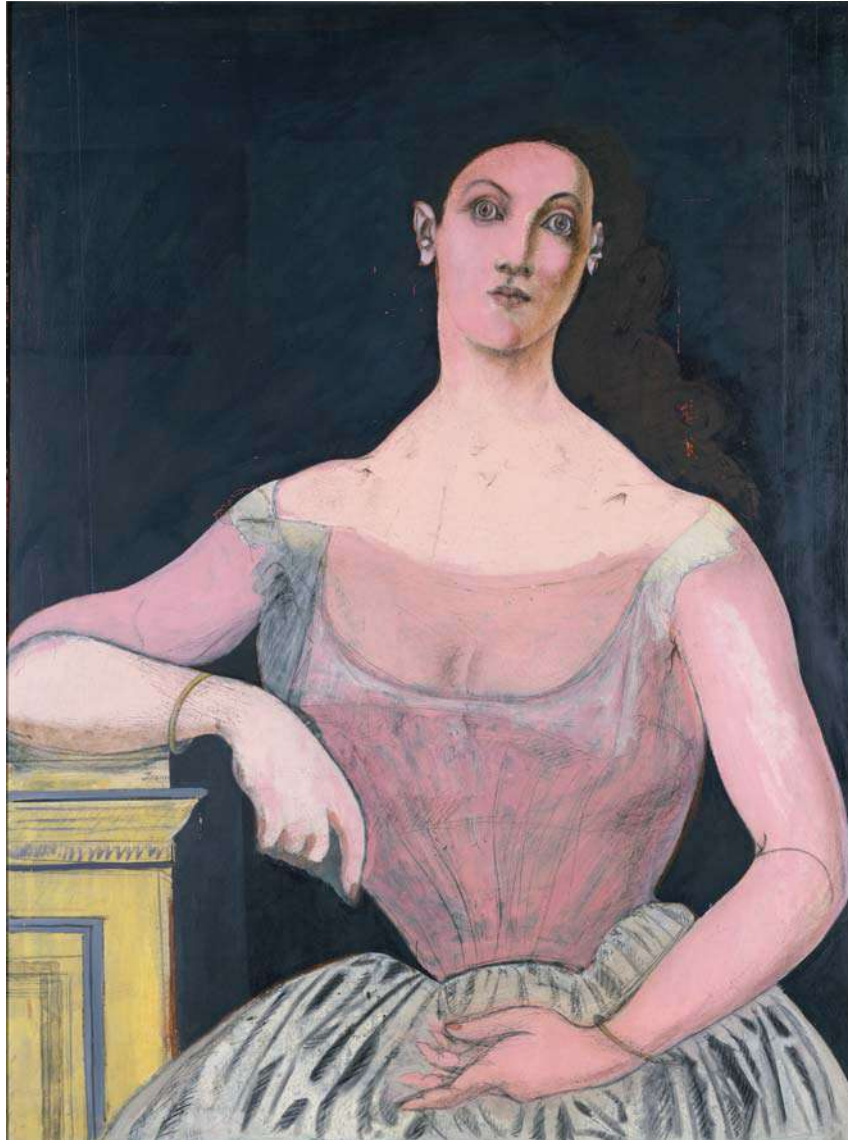
Of the following, which country had the greatest number of cars in 1992?

- A Japan  
 B Russia  
 C Australia  
 D South Africa

## UNIT 24

## Question 70

Below is a painting by John Graham, entitled *Celia*.



- 70 The painting suggests that Celia is
- A flirtatious.
  - B formidable.
  - C self-effacing.
  - D self-conscious.

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