

**ASSUMPTION ENGLISH SCHOOL
END OF YEAR EXAMINATION 2024**

**LOWER SECONDARY SCIENCE
BOOKLET A**



ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL
ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL
ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL
ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL
ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL ASSUMPTION ENGLISH SCHOOL

LEVEL:	Sec 2 Express	DATE:	4 October 2024
TEACHING GROUPS:	TG1, TG2 and TG5	DURATION:	2 hours (For Booklets A and B)

Additional Materials provided: 1 sheet of OAS paper

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your NAME, INDEX NUMBER and TEACHING GROUP at the top of this page and on the OAS paper. **Shade your index number on the OAS paper.**

This paper consists of 2 sections in 2 booklets.

Section A: Multiple-Choice Questions
Section B: Structured Questions

Section A (30 marks)

Multiple-Choice Questions

There are 30 questions in this section. Answer all questions. For each question, there are four possible answers A, B, C and D. **Choose the correct answer and record your choice in soft or 2B pencil on the OAS paper provided. DO NOT fold or bend the OAS paper.**

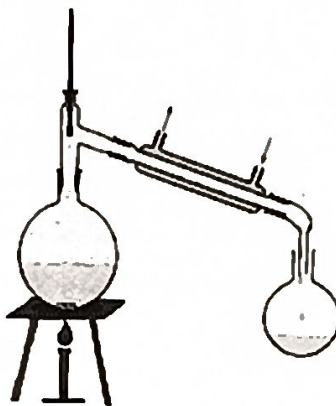
The Periodic Table is found on the last page of Booklet B.

At the end of the examination, hand in your OAS paper, Booklets A and B separately.

SECTION A: MULTIPLE-CHOICE QUESTIONS [30 marks]

There are **thirty** questions in this section. Answer **ALL** questions. For each question, there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice on the OAS paper in soft pencil.

- 1 A separation technique is carried out using the set-up shown below.

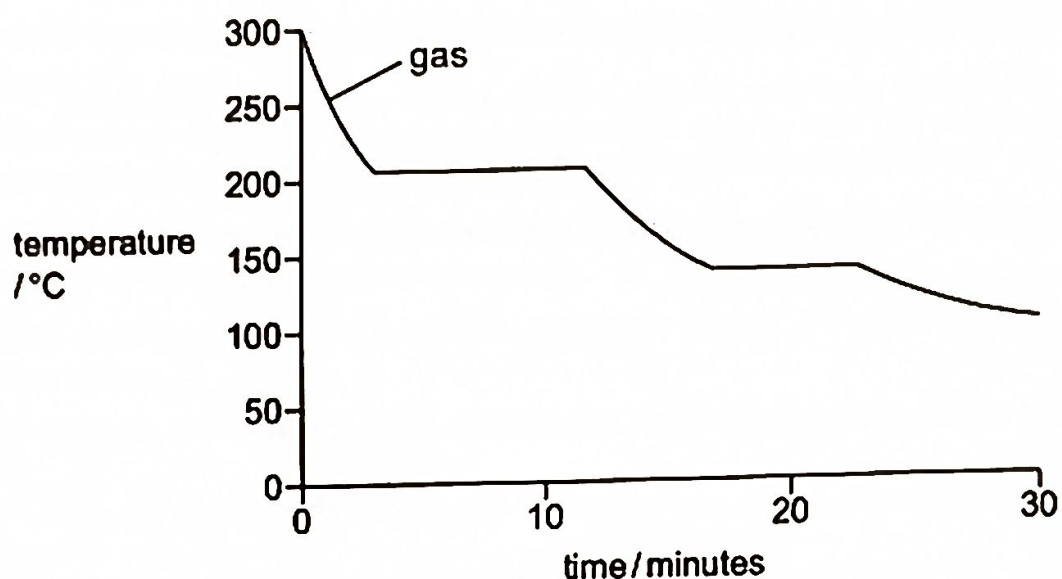


What separation technique is shown?

- A** chromatography **B** evaporation
C filtration **D** simple distillation
- 2 What is **not** needed for water treatment by reverse osmosis?
- A** a semi-permeable membrane
B high pressure
C high temperature
D pre-filtration
- 3 Which row correctly describes the physical properties of solids, liquids and gases?

	solids	liquids	gases
A	fixed volume	no fixed shape	no fixed shape
B	fixed volume	flows easily	fixed volume
C	Incompressible	compressible	Incompressible
D	no fixed volume	fixed volume	flows easily

- 4 A gaseous substance was cooled over a period of 30 minutes.



What is/are the physical state(s) of the substance at 20 minutes?

- A liquid and gas only
 - B liquid only
 - C solid and liquid only
 - D solid only
- 5 Which observation provides evidence that matter is made up of tiny particles in constant and random motion?
- A ice melting at room temperature
 - B perfume filling the room when it is sprayed
 - C solid expanding when heated
 - D water boiling to form steam
- 6 An atom has four protons, four electrons and five neutrons.
How many sub-atomic particles are present in the nucleus of the atom?
- | | |
|-----|------|
| A 5 | B 8 |
| C 9 | D 13 |

7 Which application of friction is **not** useful?

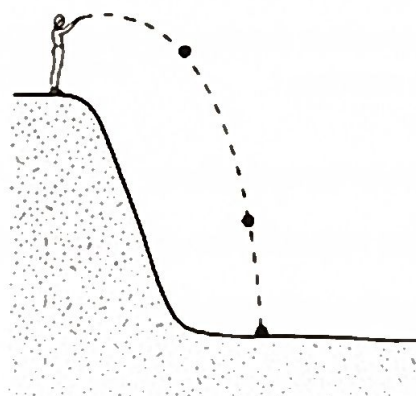
- A a car coming to a stop when the brakes are applied
- B a pair of shoes having traction when walking on a surface
- C holding a pencil to write on paper
- D mechanical parts generating heat when they are rubbed together

8 An object of a certain mass is taken up from Earth to the moon.

How does the mass and weight of the object change on the moon?

	mass on moon	weight on moon
A	less on the moon	less on the moon
B	less on the moon	remains the same as on Earth
C	remains the same as on Earth	less on the moon
D	remains the same as on Earth	remains the same as on Earth

9 A man standing at the top of a cliff throws a ball down a certain height.



Which statement correctly describes the changes in the ball's potential energy and kinetic energy as it is falling?

- A Both potential energy and kinetic energy increases.
- B Both potential energy and kinetic energy remain the same.
- C Potential energy becomes zero and kinetic energy is at a constant value.
- D Potential energy decreases and kinetic energy increases.

10 Which statement(s) about sources of energy is/are correct?

- 1 Fossil fuels are considered non-renewable because they take millions of years to form.
- 2 Geothermal energy is a renewable source of energy that harnesses heat from within the Earth.
- 3 Hydroelectric energy is generated by converting the chemical potential energy of flowing water into electricity.
- 4 Wind energy is reliable and can generate power consistently without interruption.

- A 1 only
B 1 and 2
C 1, 2 and 4
D 2 and 3

11 A solid bar is heated at one end.

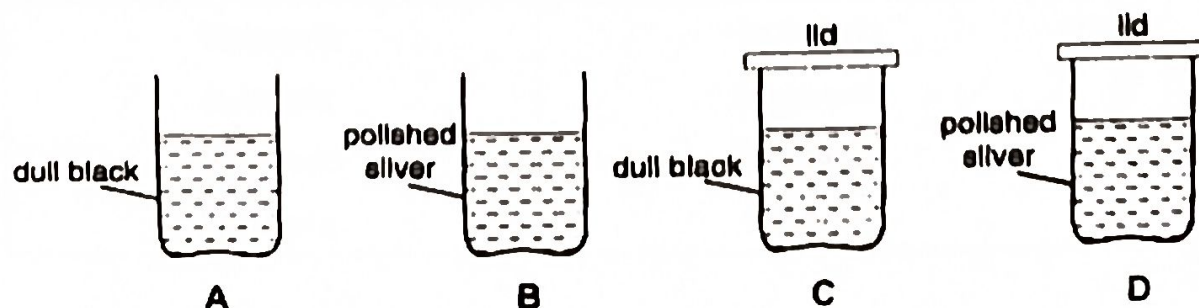
How is thermal energy transferred to the other end of the bar?

- A Heated molecules move along the bar, carrying energy to the other end.
B Heated molecules move along the bar, transferring energy to other molecules in the bar.
C Heated molecules remain stationary but transfer energy to neighbouring molecules.
D Heated molecules vibrate more rapidly and transfer energy to neighbouring molecules.

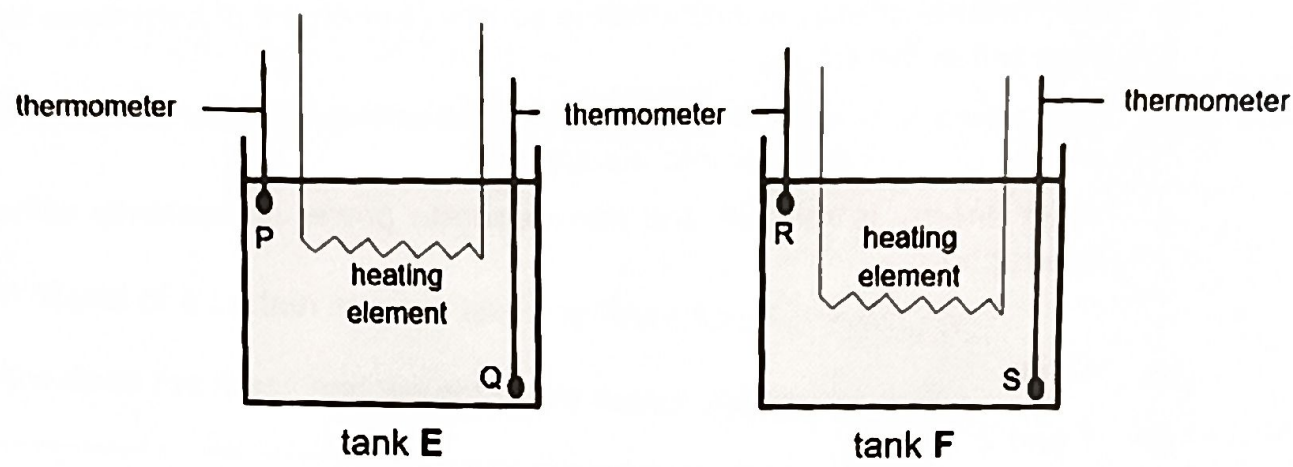
12 The diagram shows four similar cans.

Each can contains the same amount of water at 90 °C.

After five minutes, which can would contain the coolest water?



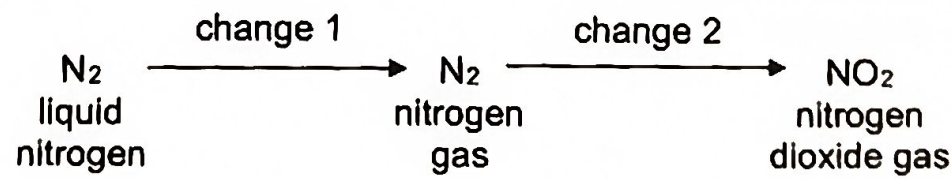
- 13 Two identical heating elements were immersed into water tanks **E** and **F** at different heights. The two heating elements were switched on for 3 minutes before a temperature reading was taken at the respective thermometers, labelled **P** to **S**.



After three minutes, what is the correct order of temperature reading observed at the different thermometers, from the highest to the lowest?

	highest				lowest
A	P	R	Q	S	
B	P	R	S	Q	
C	S	Q	R	P	
D	S	P	R	Q	

- 14 Nitrogen undergoes a sequence of changes as shown below.



Which row correctly describes the type of change that occurred?

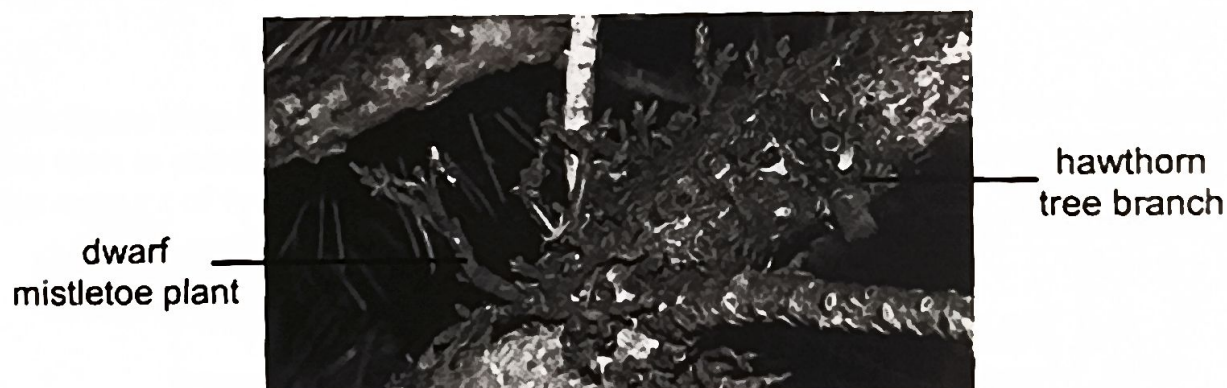
	change 1	change 2
A	chemical	chemical
B	chemical	physical
C	physical	chemical
D	physical	physical

- 15 When heated, calcium carbonate undergoes the following reaction.



What type of reaction does the word equation represent?

- A combustion
 - B electrolysis
 - C neutralisation
 - D thermal decomposition
- 16 Dwarf mistletoe plants are native to western North America and grow among the branches of hawthorn trees. These mistletoe plants use their hydrostatic pressure to shoot sticky seeds away from the parent plant at high speeds. After a mistletoe germinates, a modified root penetrates the bark of the hawthorn tree and forms a connection through which water and nutrients pass to the mistletoe plant.



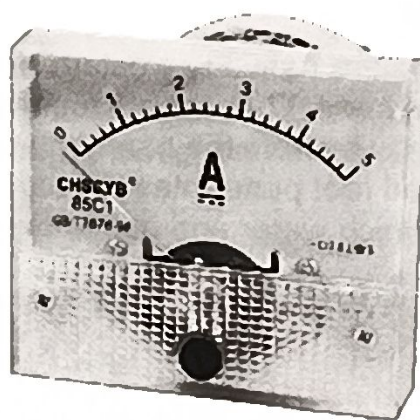
What type of relationship exists between the dwarf mistletoe plant and hawthorn tree?

- | | |
|---------------|------------------------------|
| A competition | B mutualism |
| C parasitism | D predator-prey relationship |

17 Which statement is true about bacteria and fungi in an ecosystem?

- A Bacteria and fungi break down dead organic matter and recycle nutrients in the ecosystem.
- B Bacteria and fungi compete with plants for sunlight in the process of energy production.
- C Bacteria and fungi prey on smaller organisms for food.
- D Bacteria and fungi produce their own food through photosynthesis.

18 When measuring the current in a circuit, an ammeter displays a negative reading.



What is the most likely reason for this?

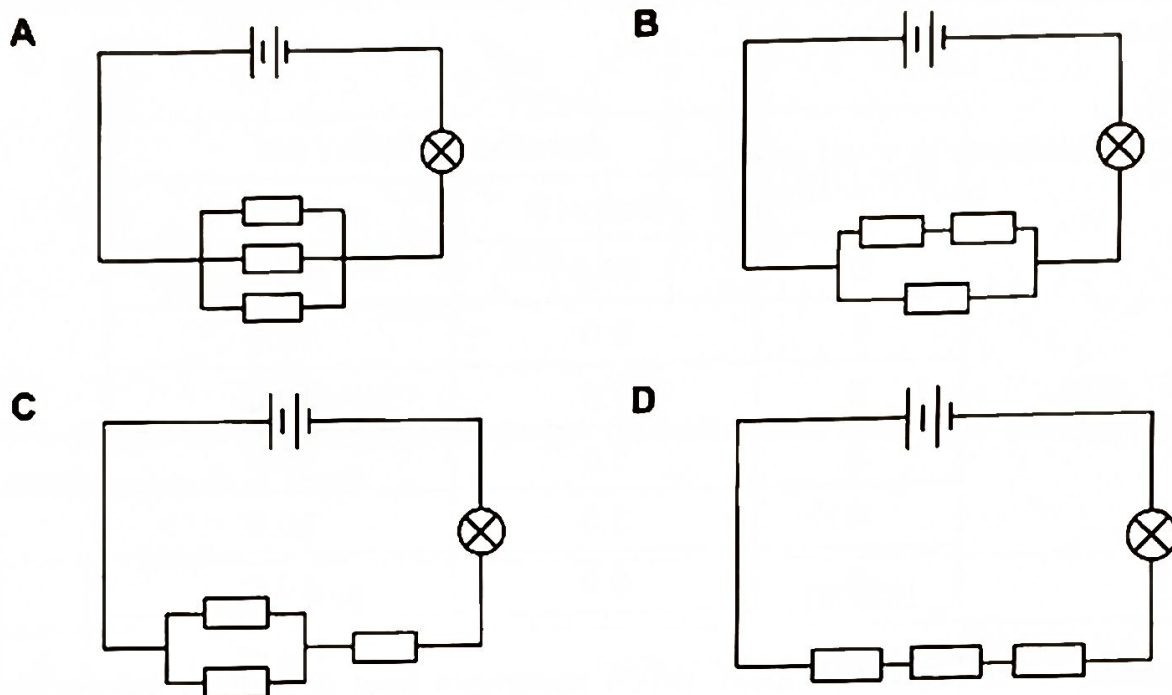
- A The ammeter is connected in parallel with the circuit.
- B The ammeter is connected with the terminals reversed.
- C The ammeter is faulty and needs to be replaced.
- D The current flowing through the circuit is very weak.

19 An electrical appliance requires a current of 12.0 A to operate. What is a suitable fuse rating for this electrical appliance?

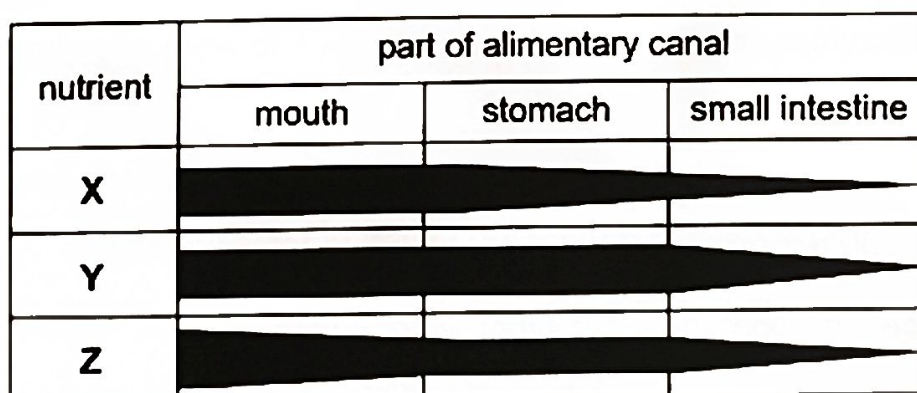
- | | |
|----------|----------|
| A 8.0 A | B 12.0 A |
| C 15.0 A | D 30.0 A |

20 Three identical resistors are connected in different configurations in a circuit.

Which configuration will the light bulb be the brightest?



21 The figure below shows how the amount of different nutrients in food changes as the food is passed along the alimentary canal. The width of each band indicates the amount of the nutrient that remains undigested.



What nutrients are X, Y and Z?

	X	Y	Z
A	fats	carbohydrates	proteins
B	proteins	fats	carbohydrates
C	proteins	carbohydrates	fats
D	carbohydrates	proteins	fats

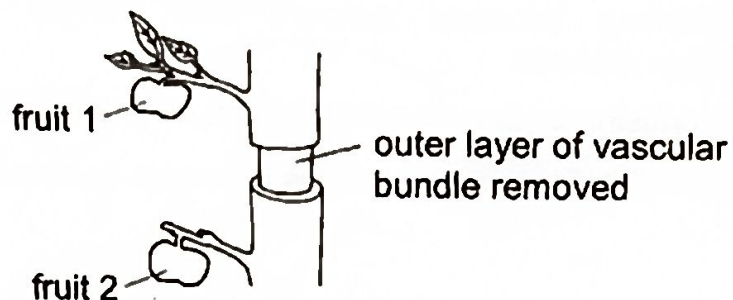
- 22** A student is studying how different types of enzymes affect oil stains. He applied the same volume of two different enzyme solutions, **P** and **Q**, to identical shirts with identical oil stains. The treatments were applied for 5 minutes at room temperature. He then measured the diameter of the oil stains at one-minute intervals.

time / min	diameter of stain / cm	
	solution P	solution Q
0	10.0	10.0
1	8.0	10.0
2	7.0	10.0
3	5.0	10.0
4	3.0	10.0
5	0.0	10.0

Based on the results shown, which statement best describes the conclusion of the experiment above?

- A** Enzymes are required for chemical reactions.
 - B** Enzymes are required in large amounts.
 - C** Enzymes are specific to one type of substance.
 - D** Enzymes require an optimum time for it to work effectively.
- 23** Which lifestyle habit is a common cause of constipation?
- A** dehydration and insufficient water intake
 - B** engaging in regular physical activity
 - C** excessive consumption of high-fiber foods
 - D** high intake of fruits and vegetables

- 24 The diagram below illustrates a fruit tree where the outer layer of vascular bundle has been removed from the stem. One twig, labelled fruit 1, has intact leaves while another twig, labelled fruit 2 has had its leaves removed. The plant is then observed for one week.



Which row correctly states the larger fruit after one week and the reason for the difference in fruit size?

	larger fruit	reason
A	fruit 1	more sugar is transported to fruit 1
B	fruit 1	no water can be transported to fruit 2
C	fruit 2	more sugar is transported to fruit 2
D	fruit 2	no water can be transported to fruit 1

- 25 Which blood vessel is correctly matched to its primary function?

	blood vessel	function
A	artery	carries oxygen-poor blood
B	artery	carries blood to the heart
C	capillary	facilitates the exchange of nutrients and waste between blood and tissues
D	vein	carries blood to the capillaries

- 26 Which is an **Incorrect** ethical consideration for organ transplant?
- A ensuring organ allocation decisions are free from discrimination based on race, gender, or socioeconomic status
 - B obtaining informed consent from donors and their families before organ retrieval
 - C prioritising organ allocation based on medical urgency and compatibility
 - D providing financial incentives for organ donation to increase donor rates

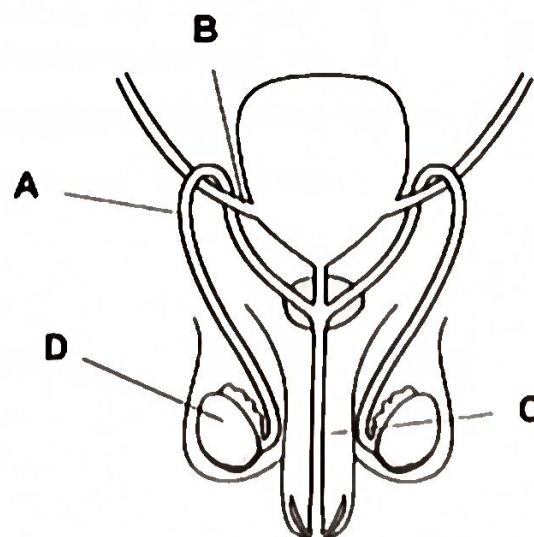
- 27 Which change(s) are most likely observed in **both** males and females during puberty?

- 1 deepening of voice
- 2 growth of pubic hair
- 3 increase in height and weight
- 4 widening of hips

- A 1 and 3
- B 2 and 3
- C 2 and 4
- D 3 only

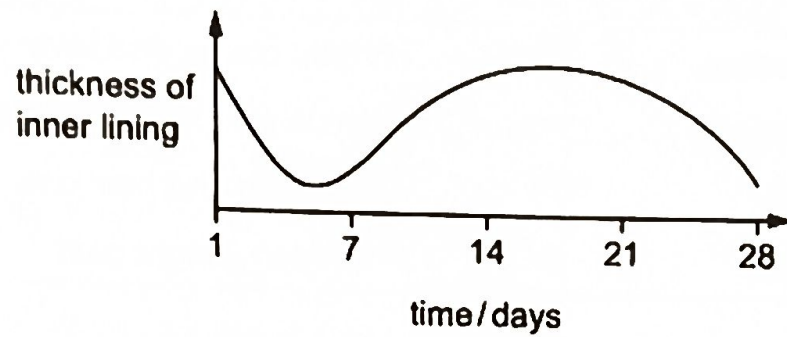
- 28 The diagram shows some parts of the male reproductive system.

Which part is responsible for producing the male sex hormones?

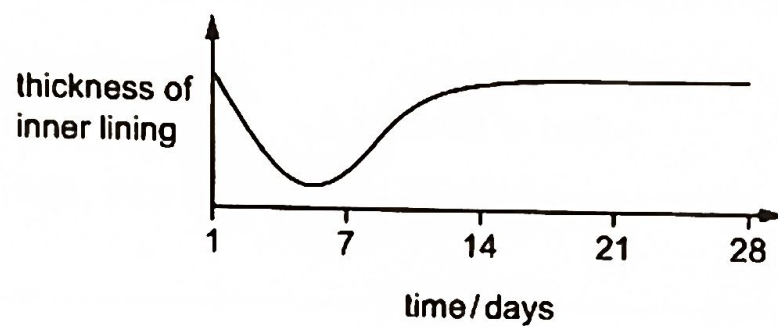


- 29 Which diagram correctly depicts the change in the thickness of the inner lining of the uterus over a 28-day menstrual cycle?

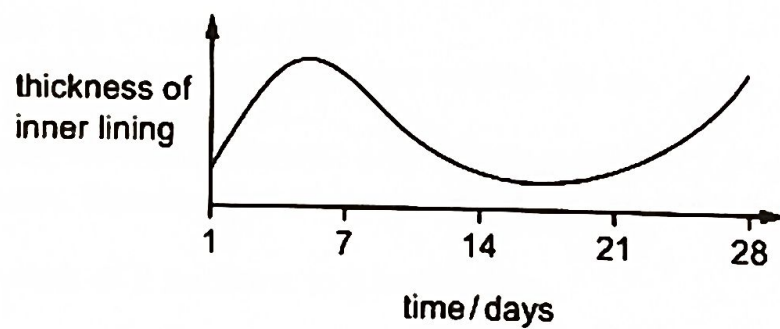
A



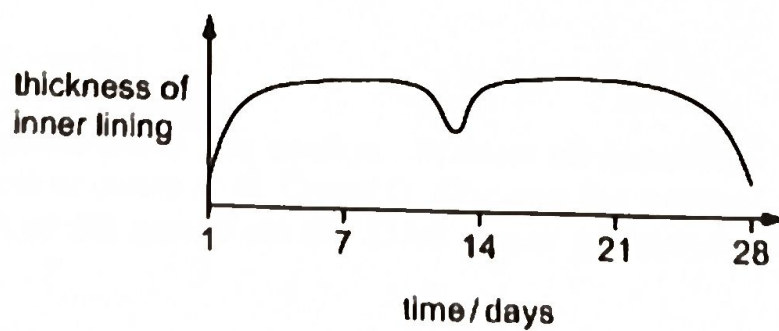
B



C



D



- 30** Which Sexually Transmitted Infection (STI) is correctly matched with its common symptoms?

	STI	symptoms
A	gonorrhea	chronic cough and fever
B	gonorrhea	painful urination and abnormal discharge
C	HIV	itchy scalp and hair loss
D	HIV	sudden weight gain

– End of Booklet A –