

PAPER

G

# PRACTICE QUESTIONS

**Note:** Some UNSW Global assessments are only available online.

## Science

**DO NOT OPEN THIS BOOKLET  
UNTIL INSTRUCTED.**

Read the instructions on the **ANSWER SHEET** and fill in your **NAME, SCHOOL** and **OTHER INFORMATION**.

Use a pencil. Do **NOT** use a coloured pencil or a pen.

Rub out any mistakes completely.

You **MUST** record your answers on the **ANSWER SHEET**.

Mark only **ONE** answer for each question.

Your score will be the number of correct answers.

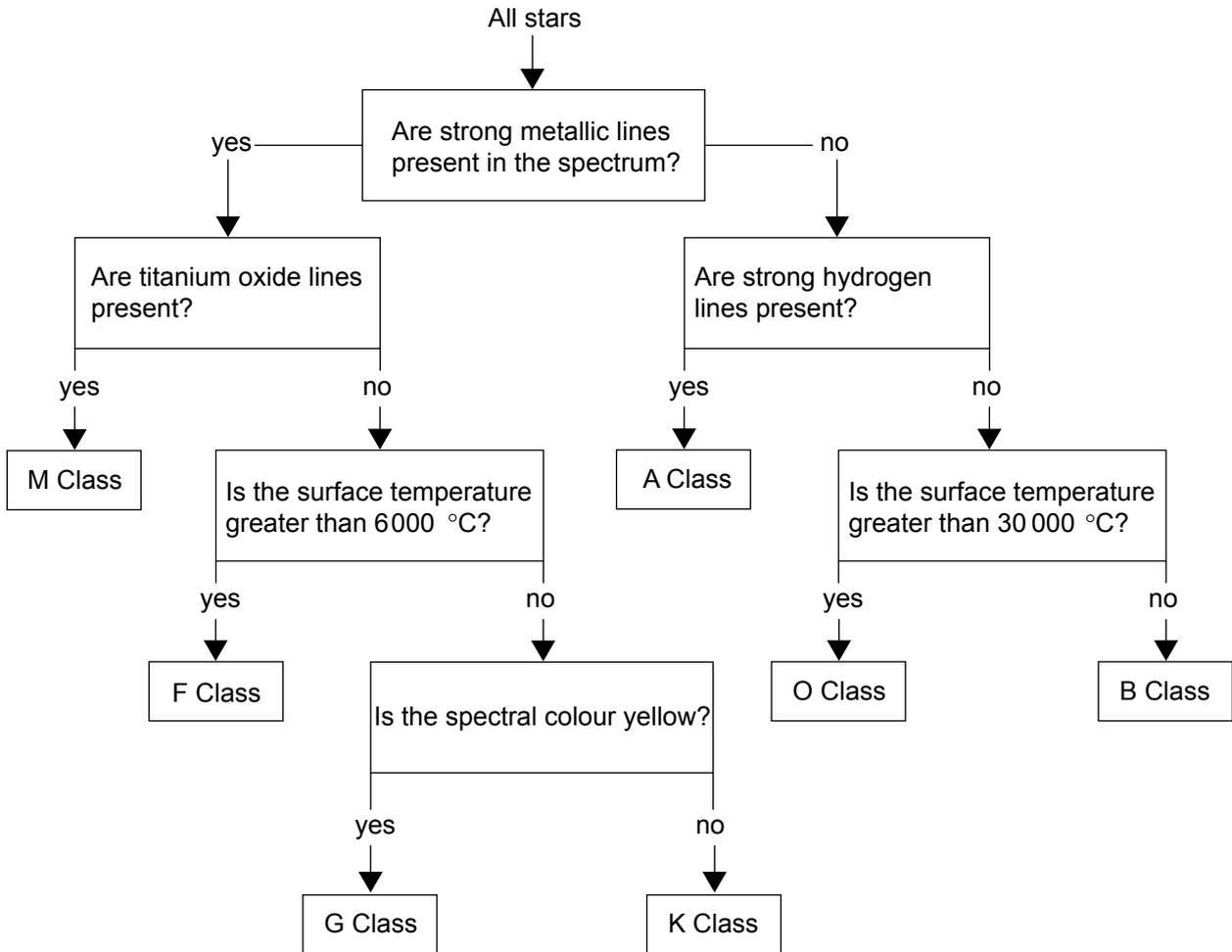
Marks are **NOT** deducted for incorrect answers.

Use the information provided to choose the **BEST** answer from the four possible options.

On your **ANSWER SHEET** fill in the oval that matches your answer.

You may use a calculator and a ruler.

1. The flow chart distinguishes between some classes of stars.



Sirius is a white star which has a surface temperature of 10 000 °C. Its spectrum has hydrogen but no strong metallic lines.

What class of star is Sirius?

- (A) A Class
- (B) B Class
- (C) F Class
- (D) O Class

2. In order to X-ray the digestive system, it is necessary to swallow a dense and very insoluble substance which will not react with the chemicals (mainly water and hydrochloric acid) in the stomach.

Information about some substances is given in the table.

Substance	Density (g/cm <sup>3</sup> )	Solubility in water (g/100 mL)	Reaction to hydrochloric acid
caesium carbonate	4.0	$2.6 \times 10^{17}$	reacts to form carbon dioxide
iron(III) hydroxide	3.9	$9.9 \times 10^{-18}$	reacts to form iron (III) chloride
barium sulfate	4.5	$2.5 \times 10^{-4}$	does not react
magnesium sulfate	2.7	$3.6 \times 10^1$	does not react

Which substance shown would be most suitable for use when X-raying the digestive system?

- (A) caesium carbonate  
 (B) iron(III) hydroxide  
 (C) barium sulfate  
 (D) magnesium sulfate
3. A scientist wanted to investigate the effects of two types of antibiotics, X and Y, on the growth of the bacterium, E. coli. He grew five cultures of the bacterium in a growth medium placed on separate Petri dishes like the one shown.



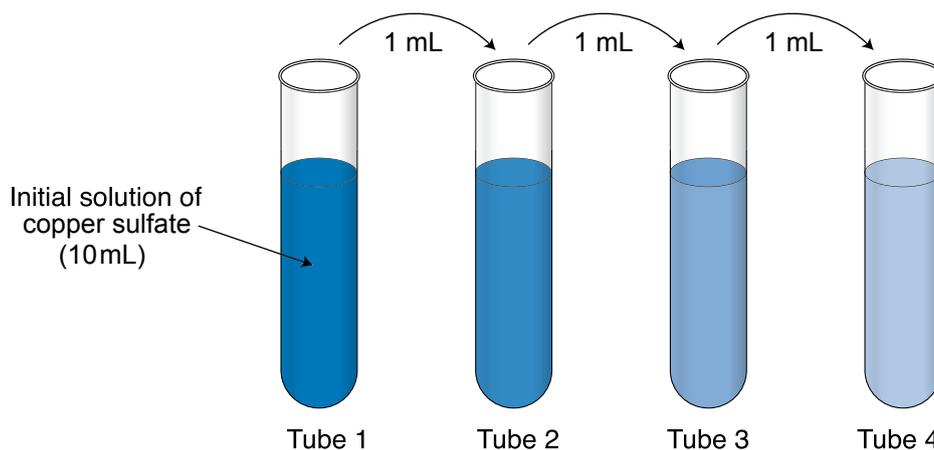
Information about the preparation of the five dishes is shown in the table.

Experimental Condition	Petri Dish				
	I	II	III	IV	V
Amount of growth medium in dish (mL)	10	15	10	20	15
Type of antibiotic added to dish	X	X	Y	X	Y
Amount of antibiotic added to dish (mL)	3	2	2	2	2
Temperature at which dish is kept (°C)	30	25	30	30	25

Which two dishes should he use to compare the effects of X and Y on the growth of the bacteria?

- (A) I and III  
 (B) II and V  
 (C) III and IV  
 (D) IV and V

4. Serial dilution is a procedure used to make a very dilute solution. The procedure for diluting a solution of copper sulfate is shown.



A student estimated that there were 1 000 000 particles of the dissolved substance in the initial solution.

How many dilutions would she have to perform to obtain a solution with approximately 100 particles of the dissolved substance?

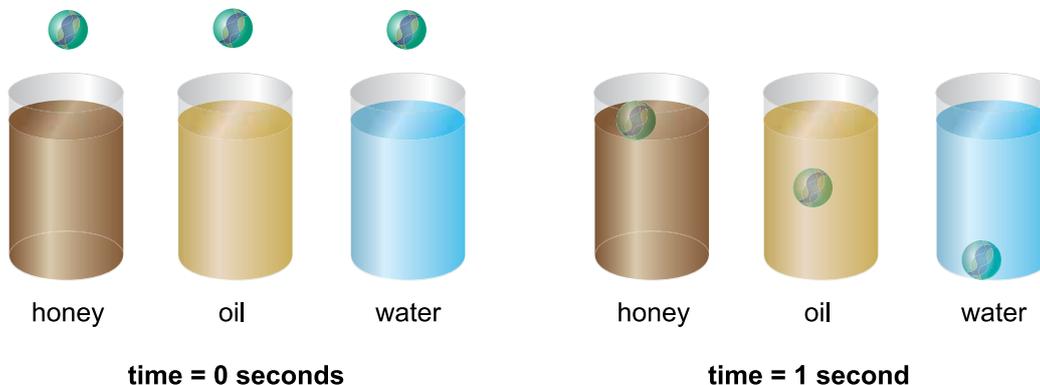
- (A) 3                      (B) 4                      (C) 5                      (D) 6

5. Reports about science experiments often include:

- a title
- an introduction
- an aim
- a method of how the experiment was to be carried out
- results (what was observed)
- a discussion of the results
- a conclusion

A student wrote a report containing a number of points.

- 1) 'Which liquid is the most viscous?'
- 2) The viscosity of the liquid is how 'thick' it is. The more viscous the liquid, the slower the marble will pass through it.
- 3) To determine the most viscous: honey, oil or water.
- 4) Set up three identical jars filled with the different liquids.
- 5) Drop a marble in each jar at the same time and record the marble's position after one second.
- 6)



- 7) The marble in the honey was near the top of the jar while the marble in the water was at the bottom of the jar.
- 8) Water was the most viscous liquid tested.

Which points are the student's results?

- (A) 4 and 5
- (B) 5 and 6
- (C) 6 and 7
- (D) 7 and 8

END OF PAPER

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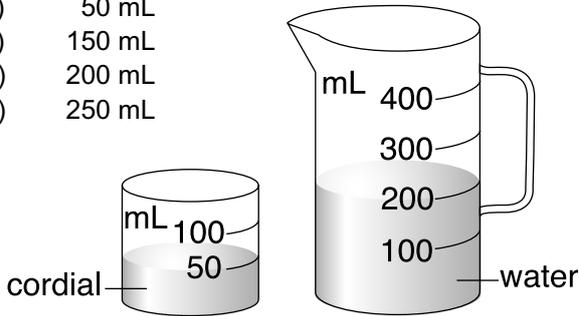


## TO ANSWER THE QUESTIONS

### Example:

Ari added cordial to water to make a jug of drink. What will be the volume of the drink in the jug?

- (A) 50 mL
- (B) 150 mL
- (C) 200 mL
- (D) 250 mL



The answer is 250 mL, so you would fill in the oval (D), as shown.

(A) (B) (C) (D)



USE A PENCIL  
DO NOT USE A COLOURED PENCIL OR PEN

## START

- |   |     |     |     |     |
|---|-----|-----|-----|-----|
| 1 | (A) | (B) | (C) | (D) |
| 2 | (A) | (B) | (C) | (D) |
| 3 | (A) | (B) | (C) | (D) |
| 4 | (A) | (B) | (C) | (D) |
| 5 | (A) | (B) | (C) | (D) |

SAMPLE

QUESTION	KEY	KEY REASONING	LEVEL OF DIFFICULTY
1	A	Sirius does not have strong metallic lines but has strong hydrogen lines. The temperature is irrelevant to this question.	Easy
2	C	In order to X-ray the digestive system, it is necessary to swallow a dense and very insoluble substance. From the table, barium sulfate has the highest density and lowest solubility; it also does not react with hydrochloric acid. Only the last two chemicals do not react with hydrochloric acid, so answers A and B are wrong. Magnesium sulfate is less dense and more soluble than barium sulfate, so D is wrong.	Medium
3	B	To compare the effect of the two types of antibiotics on the growth of bacterium, <i>E. coli</i> , the scientist needs to make sure that all other possible variables were kept the same except for the antibiotic used. This only happens in petri dishes II and V.	Medium
4	B	Each dilution reduces the concentration by a factor of 10. Therefore to reduce 1 000 000 to 100 we have to divide 1 000 000 four times by 10.	Medium/Hard
5	C	Results are 'observations' made using our five senses, particularly sight. We can see the marbles above the jars at time = 0 s, and we can see the jars with the marbles in them at t = 1 s, at different positions within the liquids. So point 6 and point 7 of the report are observations. Note that which liquid is the most or least viscous is an inference which is based on observations. It itself is not an observation.	Medium/Hard

#### LEGEND

Level of difficulty refers to the expected level of difficulty for the question.

**Easy** more than 70% of candidates will choose the correct option.

**Medium** about 50–70% of candidates will choose the correct option.

**Medium/Hard** about 30–50% of candidates will choose the correct option.

**Hard** less than 30% of candidates will choose the correct option.

## THE FOLLOWING YEAR LEVELS SHOULD SIT THIS PAPER

<b>Australia<sup>1</sup></b>	Year 9
<b>Brunei</b>	Form 4
<b>Egypt</b>	Year 9
<b>Hong Kong</b>	Form 3
<b>Indian Subcontinent<sup>2</sup></b>	Class 9
<b>Indonesia</b>	Year 10
<b>Malaysia</b>	Form 3
<b>Middle East<sup>3</sup></b>	Class 9
<b>New Zealand/ Pacific<sup>4</sup></b>	Year 10
<b>Singapore</b>	Secondary 2
<b>Southern Africa<sup>5</sup></b>	Grade 9



- 1 All international schools registered with UNSW Global (which have an 8-digit school code starting with 46) should sit the papers according to the Australian year levels.
- 2 Indian Subcontinent Region: India, Sri Lanka, Nepal, Bhutan and Bangladesh.
- 3 Middle East Region: United Arab Emirates, Qatar, Kuwait, Saudi Arabia, Bahrain, Oman, Turkey, Lebanon, Tunisia, Morocco, Libya, Algeria, Jordan and Pakistan.
- 4 Pacific Region: Vanuatu, Papua New Guinea and Fiji.
- 5 Southern Africa Region: South Africa, Botswana, Lesotho, Swaziland, Zimbabwe and Namibia.



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