The Scientific Endeavour

UNIT 1

Section A Multiple Choice Questions

For each question, choose the most suitable option and write its letter (A, B, C or D) in the brackets provided.

1. Which the following does **not** help in the collection of scientific data?

   A Texture **B** Sound
   C Feelings **D** Taste [ ]

2. Chemistry is the study of _____.

   A force and energy **B** weather
   C substances **D** living things [ ]

3. Laboratory apparatus are mainly made of glass because they _____.

   A can be cleaned well
   B are easily available
   C can withstand heat
   D are transparent [ ]

4. We should keep reagent bottles _____.

   A on the bench rack
   B uncapped
   C unlabelled
   D under direct sunlight [ ]

5. Global warming is a harmful effect of technology and is due to _____.

   A our freedom to express our thoughts through social media
   B our use of cell phones at inappropriate times
   C an increase in the number of cars on the road
   D pollution of land and water by plastic products [ ]

6. A _____ is used to observe cells.

A microscope B telescope
C periscope D bioscope [ ]

7. Which of the following statements are true about the characteristics of scientists?

I Scientists often try to disprove their own ideas.
II Different scientists may get different solutions to the same problem.
III Scientists assume that nature follows the same 'rules' or 'laws' throughout the universe.

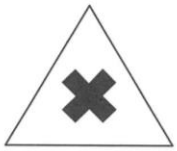
A I only B I and II only
C II and III only D I, II and III [ ]

8. Which of the following observations is quantitative?

A Sugar makes water taste sweet.
B Pure water boils at 100 °C.
C Oil makes paper translucent.
D Metals expand when heated. [ ]

9. Ammonia solution is an irritant. Which one of the following warning symbols will be labelled on the ammonia solution container?

A 

B 

C 

D 

[ ]

10. What is Science?

A Science is the study of living things.
B Science is the study of the universe.
C Science is the systematic inquiry of knowledge.
D Science is the study of forces and energy. [ ]

11. Which of the following are the benefits of technology?

I More diseases can be cured with the development of medicines.
II The development of fertilisers has increased the production of our food.
III Technology has been used to create weapons like atomic bombs and missiles.

A I only
B I and II only
C I and III only
D I, II and III [ ]

12. Which one of the following represents the correct order of the steps to be carried out for a scientific method of investigation?

A Observation, Hypothesis, Experiments, Prediction.
B Experiments, Hypothesis, Observation, Prediction.
C Observation, Hypothesis, Prediction, Experiments.
D Hypothesis, Experiments, Observation, Prediction. [ ]

13. One of the serious harmful effects of technology is _____.

A pollution
B transportation
C electrification
D computerisation [ ]

14. Which apparatus is used to measure 25.0 cm^3 of liquid very accurately?

A measuring cylinder
B beaker
C pipette
D conical flask [ ]

15. Which statement about Science and scientists is **not** correct?

A Scientists can interpret the same observation and data in different ways.

B Scientists can measure the strength of typhoons and earthquakes but cannot prevent them from happening.

C Scientists know the causes of many diseases and can always stop diseases from spreading from one person to another.

D Scientists know how to cure genetic diseases through genetic engineering but Science cannot answer related ethical issues.

[ ]

Section B Short Answer Questions

Answer all the questions in the spaces provided.

1. Thomas Edison was the inventor of the light bulb. He is considered a scientist. Give some values he displayed as a scientist.

_____

_____

2. Match the following.

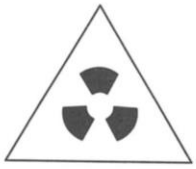
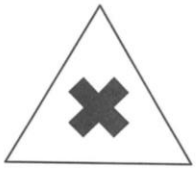
	Discovery/Invention		*Scientist*
(a)	Discovery of radium	»	« Albert Einstein
(b)	Father of electricity	»	« Louis Pasteur
(c)	Discovery that germs cause food to go bad	»	« Marie Curie
(d)	Discovery of penicillin, the first antibiotic	»	« Michael Faraday
(e)	Discovered the theory of relativity, $E = mc^2$, where energy and mass are equivalent	»	« Alexander Fleming

3. What do the following terms mean?

	Term	*Meaning*
(a)	Variable	
(b)	Hypothesis	
(c)	Observation	

4. Use the given words to complete the table.

Uranium Concentrated suphuric acid Corrosive substance
Alcohol Irritant Radioactive substance

Symbol	*Type of Hazard*	*Example*
(a) 		
(b) 		
(c) 		

5. Choose the most suitable apparatus to be used for the following activities in the laboratory.

Burette	Beaker
Gas jar	Measuring cylinder
Evaporating dish	Conical flask

(a) To allow a solution to evaporate slowly: _____

(b) For measuring a volume of liquid to an accuracy of 1.0 cm^3: _____

(c) For measuring a volume of liquid to an accuracy of 0.01 cm^3: _____

(d) For collecting gases: _____

6. State whether each statement is 'True' or 'False'.

(a) We make a fair test by controlling variables. _____

(b) Discoveries made by scientists always build on the work of others. _____

(c) Science can answer all ethical and social issues. _____

(d) Qualitative information is obtained through using measuring instruments. _____

(e) The independent variable is the variable we want to change. _____

Section C Free Response Questions

Answer all the questions in the spaces provided.

1. (a) What is *technology*?

_____

_____

(b) Give **two** benefits of technology.

(i) _____

(ii) _____

(c) Give **two** abuses or harmful consequences of technology.

(i) _____

(ii) _____

2. (a) Explain in your own words what you understand by the term *scientific method*.

_____

_____

_____

(b) What are the four major steps in *the scientific method*?

1. _____

2. _____

3. _____

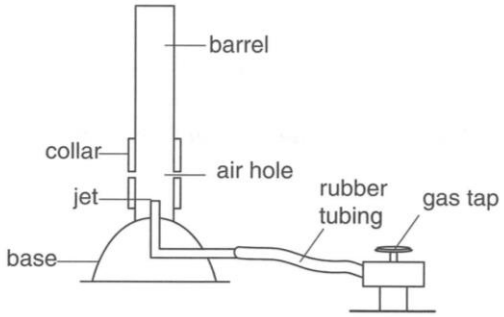
4. _____

(c) What happens if the results do **not** agree with the hypothesis?

_____

_____

3. **(a)** The diagram shows the parts of a Bunsen burner. State the steps involved in the lighting up of the Bunsen burner.



(b) A luminous flame is produced when the air hole is closed, while a non-luminous flame is produced when the air hole is open. Give **two** other visible differences between a luminous and non-luminous flame.

	Luminous flame	*Non-luminous flame*
(i)		
(ii)		

(c) Briefly explain how you would find out if the luminous flame or the non-luminous flame is hotter.

4. (a) Give **two** general safety rules in the laboratory.

(b) What should you do when chemicals spill on your skin?

5. The table shows the results from an experiment.

	Volume of water (cm^3)	*Number of ice cubes*	*Temperature of water (°C)*	*Time taken for the ice cubes to melt completely (s)*
A	20	4	30	40
B	20	4	40	30
C	20	4	50	20
D	20	5	50	25

(a) State the hypothesis and the aim of this experiment.

_____

(b) Identify the following variables in the above experiment.

(i) Variable that changed: _____

(ii) Variable that is observed or measured: _____

(iii) Variable that remained constant: _____

(c) Which of the above test results **cannot** be used for the conclusion? Why?

_____

_____

(d) Why is it necessary to perform a controlled experiment?

_____

_____

(e) What are the other controlled variables that are not added in the above experiment?

_____

_____