BRITISH COUNCIL

CBSE

Competency-based education for CBSE

Item Bank:

Science Class 7

September 2021

Content created by AlphaPlus

Introduction for teachers

A bank of resources has been created to support teachers to develop and administer end-of-class tests. These resources should be used together. You can view and download the following resources from http://cbseacademic.nic.in:

- Learning ladder for science
- Assessment specification for science
- Sample lesson plans

This document is a compilation of the sample items for Science Class 7. There are 47 items.

This item bank is supported by the assessment specification which sets out the end-of-class assessment requirements and the learning ladder for the subject which maps the CBSE syllabi content to the NCERT curriculum. The item index (page 6) shows how each item maps to the learning ladder content and the assessment objectives.

What these assessment items can be used for

You can use the bank of questions in whatever way you wish but three main purposes have been identified:

- Create end-of-class assessments using the items from the bank to meet the requirements set out in the assessment specifications.
- Create end-of-topic tests using the items from the bank for when you finish teaching a topic.
- Use individual or groups of questions from the bank to create or add to worksheets for use in class and for homework.

What is in this document

You will find linked questions and single questions which cover different aspects of the learning ladder content and different assessment objectives. You can use these questions to create your own assessments.

Each item in this document begins with the metadata (see Figure 1). The metadata gives details of the content, assessment objective coverage and the number of marks.

There is then a section showing any source material needed followed by the questions themselves and finally the mark scheme for the questions.

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7VD41a		1			7.5.1	1
Science7VD41b	1				7.5.1	1
Science7VD41c	3				7.5.1	3
Science7VD41d		2			7.5.1	2
Total marks	4	3				7

Figure 1: Example of metadata

How to use the assessment items

You can peruse the bank of items by flicking through this document and selecting questions you wish to use. However, if you are assessing specific content then you can use the learning ladder to identify this content and then use the item index (page 6) to find any items which cover that content.

Please note that not all of the content will have items. The item bank is only a sample of the questions which could be created so it may be necessary for you to write questions of your own to fill gaps.

When you find a relevant assessment item in this document, you can copy and paste the question(s) and any source material into a new Word document which will form the assessment or worksheet. Other questions from the bank can be copied and pasted to this document and an assessment or worksheet covering a range of items created. The questions can then easily be edited in the new document using Word and you can add any questions you write to best meet the needs of your classes.

Once the questions have been pasted into the new document the numbering of the items can be changed so that they run through 1, 2 etc. There should be no need to change the numbering of parts (a), (b) etc unless a question has been deleted.

You can create the mark schemes in the same way by copying the relevant section of the item documents and pasting them into a separate Word document which will form the mark scheme. Again, the question numbering will need to be amended. You can use these mark schemes to make sure that the marking is standardised, particularly if more than one teacher uses the assessment.

When creating an end-of-class test the teacher should use the assessment specification to identify the number of marks and questions needed, the balance of content to be covered and the weighting of the assessment objectives needed. You can then select items from the bank to build a test that meets the assessment specification and then order these in a logical manner so

that it allows the students to work through the assessment. You should also add a front page with the assessment name and details of the number of marks and the length of the assessment. Again, the mark scheme can be created at the same time and question numbers will need to be amended.

When copying items from the bank care needs to be taken to keep the format and style of the items consistent including the spacing and layout and ensuring that the number of marks available for each question is clearly linked to the question.

Assessment objectives

This document sets out the assessment objectives for CBSE Science and their percentage weighting for the CBSE end of year tests for the different classes from VI to X.

		Class				
No.	**Description of Assessment Objective**	**VI**	**VII**	**VIII**	**IX**	**X**
AO1	Demonstrate knowledge and understanding of scientific ideas, techniques, and procedures.	40	40	40	30	30
AO2	Apply knowledge and understanding of scientific ideas, techniques and procedures to classroom and real-world situations	40	40	40	30	30
AO3	Analyse scientific information and ideas to present data and interpret patterns and relationships	10	10	10	20	20
AO4	Evaluate scientific information to: • make judgments and draw conclusions • develop and improve experimental procedure	10	10	10	20	20

Item Index

Assessment content	Assessment topic	Filename	Question ID	AO1	AO2	AO3	AO4
7.1.1	Acidity and soils	Science7VD2	Science7VD2	1			
7.1.1	Acidity and soils	Science7SPA1	Science7SPA1	1			
7.1.2	Acidity and soils	Science7VD1	Science7VD1	1			
7.1.2	Acidity and soils	Science7SZ3	Science7SZ31a	1			
7.1.2	Acidity and soils	Science7SZ4	Science7SZ41a	3			
7.1.2	Acidity and soils	Science7SPA2	Science7SPA2		1		
7.2.1	Acidity and soils	Science7SPA3	Science7SPA31a	1			
7.2.1	Acidity and soils	Science7SPA3	Science7SPA31c	1	1		
7.2.2	Acidity and soils	Science7VD3	Science7VD31a	1	2		
8.2.1	Acidity and soils	Science7SPA3	Science7SPA31b	2			
7.2.4	Acidity and soils	ScienceSZ4	ScienceSZ41b	2			
7.2.4	Acidity and soils	Science7SPA5	Science7SPA51c	2			
7.2.4	Acidity and soils	ScienceSZ4	ScienceSZ41c	4			
7.2.4	Acidity and soils	Science7VD3	Science7VD31b		1	1	
7.3.1	Acidity and soils	ScienceSZ4	ScienceSZ41d	2			
7.3.1	Acidity and soils	Science7VD5	Science7VD51a		2		
7.3.1	Acidity and soils	Science7SZ2	Science7SZ2		1	1	
7.3.1	Acidity and soils	Science7SPA4	Science7SPA41a			2	
7.5.1	Acidity and soils	Science7VD4	ScienceVD41b	1			
7.5.1	Acidity and soils	Science7SPA5	Science7SPA51a	1			
7.5.1	Acidity and soils	Science7VD4	ScienceVD41c	3			
7.5.1	Acidity and soils	Science7VD4	Science7VD41a		1		

7.5.1	Acidity and soils	Science7VD4	Science7VD41d		2		
7.6.1	Acidity and soils	Science7SZ1	Science7SZ1	1			
7.6.1	Acidity and soils	Science7SPA4	Science7SPA41b	1	1		
7.6.1	Acidity and soils	Science7SZ5	Science7SZ51a		1		
7.6.1	Acidity and soils	Science7SZ3	Science7SZ31b		2		
7.6.1	Acidity and soils	Science7SPA4	Science7SPA41c		2		
7.6.1	Acidity and soils	Science7VD5	Science7VD51c	1			2
7.6.2	Acidity and soils	Science7SPA5	Science7SPA51b		2		
7.6.3	Acidity and soils	Science7SZ5	Science7SZ51b		2		
7.6.3	Acidity and soils	Science7VD5	Science7VD51b			1	
7.1.10	Colour and lenses	Science7DS4	Science7DS4	1			
7.1.10	Colour and lenses	Science7LP5	Science7LP51d	2			
7.1.9	Colour and lenses	Science7LP2	Science7LP2	1			
7.1.9	Colour and lenses	Science7LP5	Science7LP51a	1			
7.1.9	Colour and lenses	Science7LP5	Science7LP51b	1			
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7.2.14	Colour and lenses	Science7DS1	Science7DS1		1		
7.2.15	Colour and lenses	Science7LP4	Science7LP41a	1			
7.2.15	Colour and lenses	Science7LP4	Science7LP41b		2		
7.2.15	Colour and lenses	Science7DS6	Science7DS61a		2		
7.5.7	Colour and lenses	Science7DS6	Science7DS61b	2			
7.5.7	Colour and lenses	Science7LP4	Science7LP41c	3			
7.6.10	Colour and lenses	Science7DS3	Science7DS3	1			
7.2.6	Electric circuits	Science7BS2	Science7BS2b	2			
7.2.6	Electric circuits	Science7BS5	Science7BS5		1		
7.2.7	Electric circuits	Science7BS1	Science7BS1d	3			
7.3.2	Electric circuits	Science7BS2	Science7BS2c			2	

7.5.2	Electric circuits	Science7BS1	Science7BS1a	1			
7.5.2	Electric circuits	Science7BS1	Science7BS1b	1			
7.5.3	Electric circuits	Science7BS4	Science7BS4	1			
7.5.3	Electric circuits	Science7BS3	Science7BS31b		2		
7.5.4	Electric circuits	Science7BS2	Science7BS2a		2		
7.5.5	Electric circuits	Science7BS3	Science7BS31a				2
7.6.5	Electric circuits	Science7BS3	Science7BS31c		1		
7.1.4	Heat	Science7LP1	Science7LP1		1		
7.1.4	Heat	Science7DS7	Science7DS71c		1		
7.1.4	Heat	Science7BS1	Science7BS1c		2		
7.1.4	Heat	Science7DS2	Science7DS2		2		
7.2.8	Heat	Science7LP3	Science7LP31a	1			
7.2.8	Heat	Science7LP3	Science7LP31b	1			
7.2.8	Heat	Science7DS5	Science7DS51d		2		
7.2.8	Heat	Science7LP3	Science7LP31c			2	
7.2.9	Heat	Science7DS7	Science7DS71a	2			
7.2.9	Heat	Science7DS5	Science7DS51a		1		
7.2.9	Heat	Science7DS7	Science7DS71b		1		
7.3.4	Heat	Science7DS5	Science7DS51b	1			
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7.6.6	Heat	Science7DS5	Science7DS51c				2
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7.1.6	Organs and systems	Science7MBSA1	Science7MBSA1	1			
7.1.6	Organs and systems	Science7EVR1	Science7EVR1	1			
7.1.7	Organs and systems	Science7ARP6	Science7ARP6	1			
7.1.7	Organs and systems	Science7MB1	Science7MB1a	1			
7.1.7	Organs and systems	Science7MB1	Science7MB1c	1			
7.1.8	Organs and systems	Science7ARP1	Science7ARP1a	1			
7.1.8	Organs and systems	Science7ARP1	Science7ARP1b		2		
7.1.8	Organs and systems	Science7ARP1	Science7ARP1c			2	
7.2.10	Organs and systems	Science7ARP2	Science7ARP21a	1			
7.2.10	Organs and systems	Science7ARP2	Science7ARP21c	1			
7.2.10	Organs and systems	Science7MB2	Science7MB21a	2			

7.2.10	Organs and systems	Science7MB2	Science7MB21b	2			
7.2.10	Organs and systems	Science7ARP2	Science7ARP21b		1		
7.2.10	Organs and systems	Science7EVR3	Science7EVR31b		2		
7.2.10	Organs and systems	Science7EVR3	Science7EVR31c		3		
7.2.10	Organs and systems	Science7ARP2	Science7ARP21d				2
7.2.11	Organs and systems	Science7MBSA2	Science7MBSA2	1			
7.2.11	Organs and systems	Science7EVR2	Science7EVR2	1			
7.2.12	Organs and systems	Science7ARP3	Science7ARP31b	1			
7.2.12	Organs and systems	Science7ARP3	Science7ARP31d	1			
7.2.12	Organs and systems	Science7ARP3	Science7ARP31a	2			
7.2.12	Organs and systems	Science7EVR3	Science7EVR31d	2			
7.2.12	Organs and systems	Science7ARP3	Science7ARP31c		2		
7.2.13	Organs and systems	SCIENCE7ARP4	Science7ARP41a	1			
7.2.13	Organs and systems	SCIENCE7ARP4	Science7ARP41c	1			
7.2.13	Organs and systems	SCIENCE7ARP4	Science7ARP41d	1			
7.2.13	Organs and systems	Science7EVR4	Science7EVR41a	2			
7.2.13	Organs and systems	SCIENCE7ARP4	Science7ARP41b		1		
7.2.13	Organs and systems	Science7EVR4	Science7EVR41c			2	
7.3.5	Organs and systems	Science7MB3	Science7MB31b	1			
7.3.5	Organs and systems	Science7MB3	Science7MB31a	2			
7.3.6	Organs and systems	Science7MB1	Science7MB1b		2		
7.3.6	Organs and systems	Science7MB1	Science7MB1d		2		
7.3.6	Organs and systems	Science7EVR4	Science7EVR41b		2		
7.6.7	Organs and systems	Science7MB2	Science7MB21c		1		
7.4.1	Systems and organs	Science7EVR3	Science7EVR31a		2	1	

7.4.1	Systems and organs	Science7MB3	Science7MB31c	3

Science7VD2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
ScienceVD2	1				7.2.2	1

Item purpose

The question assesses the understanding of knowledge.

Question(s)

1 With the help of your choice of a word equation, show that a new substance is formed in a chemical reaction.

(1 mark)

Mark scheme

1. With the help of a word equation, show that a new substance is formed in a chemical reaction.	
Answer	Guidance
Magnesium + Oxygen $\longrightarrow$ Magnesium oxide (1)	Accept: Any other example of a chemical reaction (1)

Science7SPA1

Item identity	AO1 marks	AO2 marks	AO3 Marks	AO4 marks	Content Reference(s)	Marks
Science7SPA1	1				7.1.1	1

Item purpose

The question assesses the student knowledge about acids.

Question(s)

1 The substances which are sour in taste and corrosive in nature are called:

A. Acids
B. Bases
C. Neutral
D. Salts

(1 mark)

Mark scheme

1 The substances which are sour in taste and corrosive in nature are called as: A. Acids B. Bases C. Neutral D. Salts	
Answer	Guidance
A. Acids	Accept only option A. or Acids

Science7VD1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7VD1	1				7.1.2	1

Item purpose

The question assesses understanding of knowledge.

Question(s)

1 The correct order of acids present in spinach, curd and vinegar respectively is

A. lactic acid, oxalic acid and acetic acid
B. acetic acid, lactic acid and oxalic acid
C. tartaric acid, lactic acid and formic acid
D. oxalic acid, lactic acid and acetic acid

(1 mark)

Mark scheme

1. The correct order of acids present in spinach, curd and vinegar respectively is A. lactic acid, oxalic acid and acetic acid B. acetic acid, lactic acid and oxalic acid C. tartaric acid, lactic acid and formic acid D. oxalic acid, lactic acid and acetic acid	
Answer	Guidance
D. oxalic acid, lactic acid and acetic acid	Accept: Option D only (1)

Science7SZ3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SZ31a	1				7.1.2	1
Science7SZ31b		2			7.6.1	2
Total marks	1	2				3

Item purpose

The question assesses the comprehension and ability of a student to establish the causes and effects of acid rains on soil.

Question(s)

1 Study the given image carefully and answer the following questions.

1(a) Name any one gas responsible for acid rains.

(1 mark)

1(b) Determine any two harms caused to soil due to acid rains.

(2 marks)

(Total marks 5)

Mark scheme

1(a) Name any one gas responsible for acid rains.	
Answer	Guidance
The answer is either SO_2 (sulphur dioxide) or NO_2 (nitrogen dioxide) (1)	On studying the given image , answer can be checked. No marks is to be given for any other answer.
1(b) Determine any two harms caused to soil due to acid rains.	
Answer	Guidance
The harms caused by acid rains to soil are 1. Soil becomes highly acidic and releases toxic substances into the soil thereby affecting the plant growth. 2. The acidic water dissolves the helpful nutrients present in the soil and washes them away before plants use them. 3. Rainwater dissolving calcium, magnesium present in the soil	The answer should mention the harms caused by acid rains on soil only and not on environment. Any two mentioned statements as given can be assigned 2 marks.

Science7SZ4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SZ41a	3				7.1.2	3
Science7SZ41b	2				7.2.4	2
Science7SZ41c	4				7.2.4	4
Science7SZ41d	2				7.3.1	2
Total marks	11					11

Item purpose

The question assesses the ability of a student to relate and draw conclusion of effect of acid rains on ground water and hence on soil and crops.

Question(s)

1

1(a) Name any three factors responsible for acidic nature of soil.

(3 marks)

1(b) Identify two common natural sources of water for irrigation of crops.

(2 marks)

1(c) State two causes responsible for the depletion of the ground water **and** explain how they reduce the amount of ground water.

(4 marks)

1(d) Describe the consequences of acid rains on ground water and on crops.

(2 marks)

(Total marks 9)

Mark scheme

<table>
<tr><td colspan="2">1(a) Name any three factors responsible for acidic nature of soil.</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>The factor which makes soil acidic are

Dead and decayed organic matter, manure, organic waste, animal waste, untreated factory and industrial waste, acid rains, excessive use of fertilisers and pesticides.</td><td>If any three of the given factors are written then 3 marks can be assigned.
If any two are as mentioned in the given factors then 2 marks can be assigned.
Likewise if only one answer is as mentioned from the given factors then 1 mark is given.</td></tr>
<tr><td colspan="2">1(b) Identify two common natural sources of water for irrigation of crops.</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>Any two from:

Rivers

Lakes

ground water

Wells

rains.</td><td>Any two of the given sources is a correct answer.

Manmade water bodies, dams , canals and are not natural sources so are incorrect answers and will not be given marks.</td></tr>
<tr><td colspan="2">1(c) State two causes responsible for the depletion of the ground water and explain how they reduce the amount of ground water.</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>Any two cause-explanation pairs from the following:</td><td>Explanation marks are for saying if the cause reduces recharge or increases consumption.</td></tr>
</table>

1.**Deforestation** (1) leading to irregular rains which decrease recharging of the ground water. (1) 2. Increased construction (1) which leads to prevention of seeping of surface water or rainwater through the soil to recharge of ground water (1) 3.Increased consumption of ground water for growing agricultural needs (1) due to irregular or scanty rains which leads to over consumption (1) 4.Increase in number of industries (1) due to growing demands leads to over consumption of ground water (1) 5. Growing dependency on ground water for household consumption (1) leads to over consumption of ground water (1)	A cause without explanation or vice versa is given one mark.
1(d) Describe the consequences of acid rains on ground water and on crops.	
Answer	Guidance
1. Increase of acidity in groundwater 2. Increase in toxic chemicals in groundwater 3. Leaching of nutrients from the soil 4. Direct harm to crops (e.g. crops die, quality diminished)	

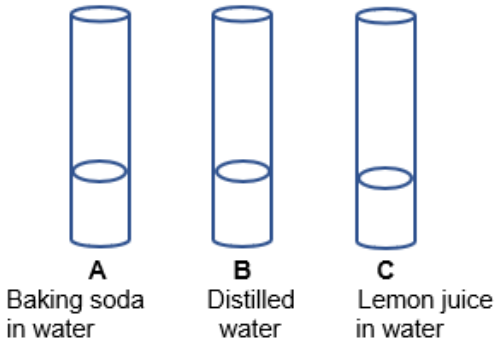
Science7SPA2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SPA2		1			7.1.2	1

Item purpose

The question assesses the student understanding of experimental investigation for identification of acidic and basic substances.

Source(s)



Question(s)

1 Three test tubes are taken as shown in the figure above. Red litmus paper was dipped in all three test tubes to test which solution is basic in nature. Identify in which test tube the red litmus paper will change its colour to blue.

(1 mark)

Mark scheme

1. Three test tubes are taken as shown in the figure above. Red litmus paper was dipped in all three test tubes to test which solution is basic in nature. Identify in which test tube the red litmus paper will change its colour to blue.	
Answer	Guidance
Test tube A	Accept ‘baking soda’

Science7SPA3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SPA31a	1				7.2.1	1
Science7SPA31b	2				7.2.3	2
Science7SPA31c	1	1			7.2.1	2
Total marks	4	1				5

Item purpose

The question assesses the student understanding of experimental investigation for neutralisation reaction.

Question(s)

1 A student took some dilute hydrochloric acid in a flask, added a few drops of phenolphthalein and mixed it gently.

After that the student added sodium hydroxide drop by drop to this colourless solution and continued until he saw some change in the colour of the solution.

1 (a) Name the type of reaction that the experiment demonstrates.

(1 mark)

1 (b) Complete the following word equation for the simple acid-base reaction that took place in the above experiment.

Sodium hydroxide + Hydrochloric acid → _____

(2 marks)

1 (c) Describe and explain the colour of the solution when sodium hydroxide was added.

(2 marks)

(Total marks 5)

Mark scheme

1. 1 (a) Name the type of reaction that the experiment demonstrates.	
Answer	Guidance
Neutralisation (1)	
1 (b) Complete the following word equation for the simple acid-base reaction that took place in the above example. Sodium hydroxide + Hydrochloric acid → _____	
Answer	Guidance
Sodium Chloride (1) + water (1)	Provide 1 M for sodium chloride and 1M for water.
1 (c) What will be change in the colour of the solution when sodium hydroxide was added. Explain the reason	
Answer	Guidance
pink/fuchsia/magenta (1) Sodium hydroxide is a base (1) OR Phenophthalein turns pink with a base	

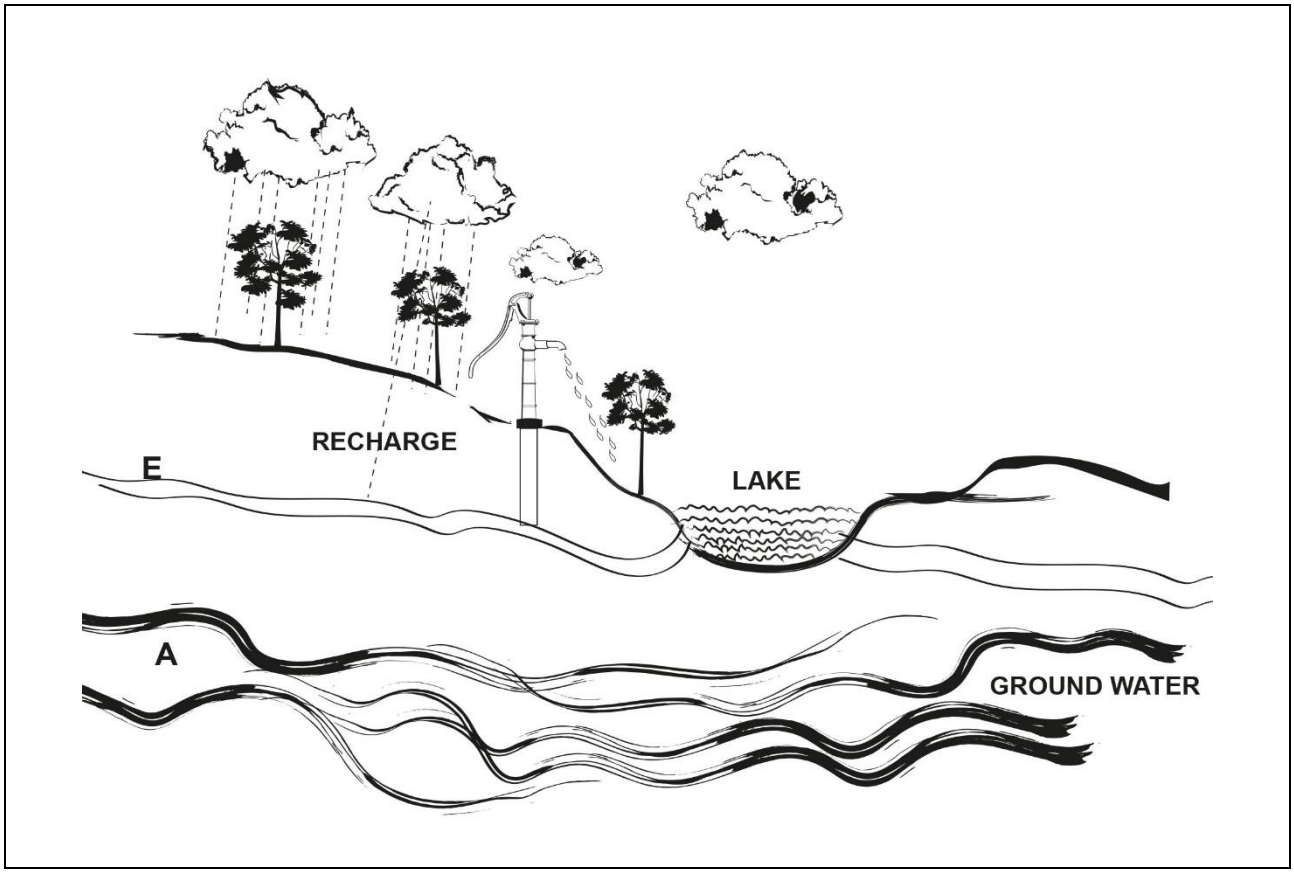
Science7VD3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7VD31a	1	2			7.2.4	3
Science7VD31b		1	1		7.2.4	2
Total marks	1	3	1			5

Item purpose

The question assesses the understanding and application of knowledge. It also assesses how one is able to analyse the situation.

Source(s)



Question(s)

1 Observe the above diagram and answer the questions given below:

1 (a) Identify ‘A’ and ‘D’. Define ‘A’.

(3 marks)

1 (b) Identify ‘E’. What would happen to ‘E’ if there was no rainfall at all in a particular area?

(2 marks)

(Total marks 5)

Mark scheme

1. 1(a) Identify ‘A’ and ‘D’. Define ‘A’.	
Answer	Guidance
‘A’ is an aquifer. (1) ‘D’ is a hand pump. (1) An aquifer contains ground water which is stored between the layers of hard rock below the water table (1)	No marks to be given if the label ‘A’ has not been identified correctly. Accept: A part of porous rock or sediment that holds ground water or saturated with ground water. (1) or words to that effect
1(b) Identify ‘E’. What would happen to ‘E’ if there was no rainfall at all in a particular area?	
Answer	Guidance
‘E’ is the water level. (1) If there was no rainfall at all in a particular area, then the water level will go down. (1)	Accept: water table No marks to be given for explanation if the answer given is ‘There will be scarcity of water’. Accept: The flow of water to the water table decreases. (1)

Science7SPA5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SPA51a	1				7.5.1	1
Science7SPA51b		2			7.6.2	2
Science7SPA51c	2				7.2.4	2
Total marks	3	2				5

Item purpose

The question assesses the student knowledge and understanding of soil fertility, causes of soil erosion and conservation of soil.

Question(s)

1 Windbreaks form efficient soil protection against wind erosion.

1 (a) Name an instrument which measures wind speed.

(1 mark)

1 (b) A farmer has no plant cover over his farm. Explain any two methods of conservation of soil that he can opt for his farm.

(2 marks)

1 (c) In a village, farmers were dependent on groundwater for the cultivation of their crops. One year due to ground water depletion they were unable to irrigate the crops properly.

List one cause of ground water depletion and describe its effect on soil fertility.

(2 marks)

(Total marks 5)

Mark scheme

1 (a) Name an instrument which measures wind speed.	
Answer	Guidance
Anemometer (1)	
1 (b) A farmer has no plant cover over his farm. Explain any two methods of conservation of soil that he can opt for his farm.	
Answer	Guidance
Planting trees (1) Use of cover crops (1)	Any other method through which conservation of soil can take place on the farm is acceptable.
1 (c) In a village, farmers were dependent on groundwater for the cultivation of their crops. One year due to ground water depletion they were unable to irrigate the crops properly. List one cause of ground water depletion and describe one of its effects on soil fertility.	
Answer	Guidance
Frequent pumping of water or over exploitation of ground water or less rainfall or less catchment area (1) Soil fertility will be reduced. (1)	Accept any valid point

Science7VD5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
ScienceVD1a		2			7.3.1	2
ScienceVD1b			1		7.6.3	1
ScienceVD1c	1			2	7.6.1	3
Total marks	1	2	1	2		6

Item purpose

The question assesses the understanding and applying the knowledge. It also helps them to analyse the data and give reason for the given situation.

Source(s)

https://farmingmethod.com/soil-ph-for-growing-vegetables-chart/

Question(s)

1 Observe the data and answer the questions given below:

Vegetable/Cereals	Required pH of the soil
Radish	4.5 -5.5
Mushrooms	7.0-8.0
Sweet potato	5.5-6.0
French beans	7.5
Peas	5.6-6.6
Paddy	5.5-7.0
Wheat	6.0-7.0

1(a) Name any two vegetables which need acidic soil to grow well.

(2 marks)

1(b) Sujata wants to grow French beans in her garden. She thinks she needs basic (alkaline) soil for them. Do you agree with Sujata? Explain your answer.

(1 mark)

1(c) Golu, a farmer, grew paddy in his field. In spite of growing the crop in clay soil and providing good irrigation, he observed poor growth of the saplings. Before transplantation, he had checked the pH of the soil and found it to be 8.0. What could be the reason for poor growth of the crop? Suggest a method for soil improvement for a good yield.

(3 marks)

(Total marks 6)

Mark scheme

1. 1(a). Name any two vegetables which need acidic soil to grow well.	
Answer	Guidance
Radish (1) Peas (1) Sweet potato (1)	Any two vegetables (2)
1(b) Sujata wants to grow French beans in her garden. She thinks she needs basic (alkaline) soil for them. Do you agree with Sujata? Explain your answer.	
Answer	Guidance
Yes Because require 7.5, which is alkaline (1)	
1(c) Golu, the farmer grew paddy in his field. In spite of growing the crop in clayey soil and providing good irrigation, he observed poor growth of the saplings. Before transplantation, he had checked the pH of the soil and found it to be 8.0. What could be the reason of poor growth of the crop? Suggest a method for soil improvement for a good yield.	

Answer	Guidance
Paddy requires soil with pH of 5.5 - 7.0 for good growth. (1) This means that paddy grows well in acidic soil (1) but Golu planted the seedlings in the soil that was basic in nature. (1) He should have gained correct knowledge of the pH required for the paddy crop. (1) He can add organic matter (1) for good growth of the crop. (Max 3 marks)	Accept: He can add compost / Supply of specific nutrients which can make the pH of soil balanced for that crop (1)

Science7SZ2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SZ2		1			7.3.1	1

Item purpose

The question assesses knowledge and application of pH

Question(s)

1 You have been asked to predict the pH of the soil after the rains, of a field on the outskirts of a city. Will the expected pH be more or less than 7?

(1 mark)

Mark scheme

1. You have been asked to predict the pH of the soil after the rains, of a field on the outskirts of a city. Will the expected pH be more or less than 7?	
Answer	Guidance
The pH of the soil, after the rains will be less than 7. (1) No marks to be given for any other answer.	The answer 'pH of the soil will be more than 7 'is incorrect. Acid rains take place due to high amount of acidic air pollutants in the city and outskirts.

Science7SPA4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SPA41a			2		7.3.1	2
Science7SPA41b	1	1			7.6.1	2
Science7SPA41c		2			7.6.2	2
Total marks	1	3	2			6

Item purpose

The question assesses the student understanding of experimental investigation of soil pH which affects the growth of plant.

Source(s)

Soil	pH	Solubility of ions (µg/plant)	Height of plants (mm)
A	3.6	1660	1
B	9.5	1860	1.5
C	7	4560	10

Source – Self created

Question(s)

1 A biologist took three plants of the same variety and potted them in three different soils A, B and C having different pH. He then monitored the growth of the plant for a period of 10 days and made observations on the 10th day as provided in the table above.

1 (a) Analyse the table given above and draw two main inferences regarding the

growth of the plants in relation to the pH of the soils.

(2 marks)

1 (b) Name a substance that can be added to soil A to improve plant growth.

Give a reason to support your answer.

(2 marks)

1 (c) The biologist suggested adding compost or manure in the field having Sample B type of soil. Explain what its effect on soil fertility would be.

(2 marks)

(Total marks 8)

Mark scheme

1. 1 (a) Analyse the table given above and draw two main inferences regarding the growth of the plants in relation to the pH of the soils.	
Answer	Guidance
The plant can grow best in soil neutral/C (1) The plant growth is not proper when the pH of soil is 3.6 or 9.5 (1) The plant grows better in B/alkaline soil than A/acidic	
1 (b) Name a substance that can be added to soil A to improve plant growth. Give a reason to support your answer.	
Answer	Guidance
Quicklime / slaked lime / lime / calcium oxide / calcium hydroxide (1) It is a base / it neutralises the soil / plants require neutral soil (1)	Solidus separates possible correct answers within same mark point

1 (c) The biologist suggested adding compost or manure in the field having Sample B type of soil. Explain what its effect on soil fertility would be.	
Answer	Guidance
The soil fertility will improve (1) Manure releases acids which neutralised the basic nature of soil. (1) OR Manure contains nutrients that support plant growth OR Manure contains organic matter	

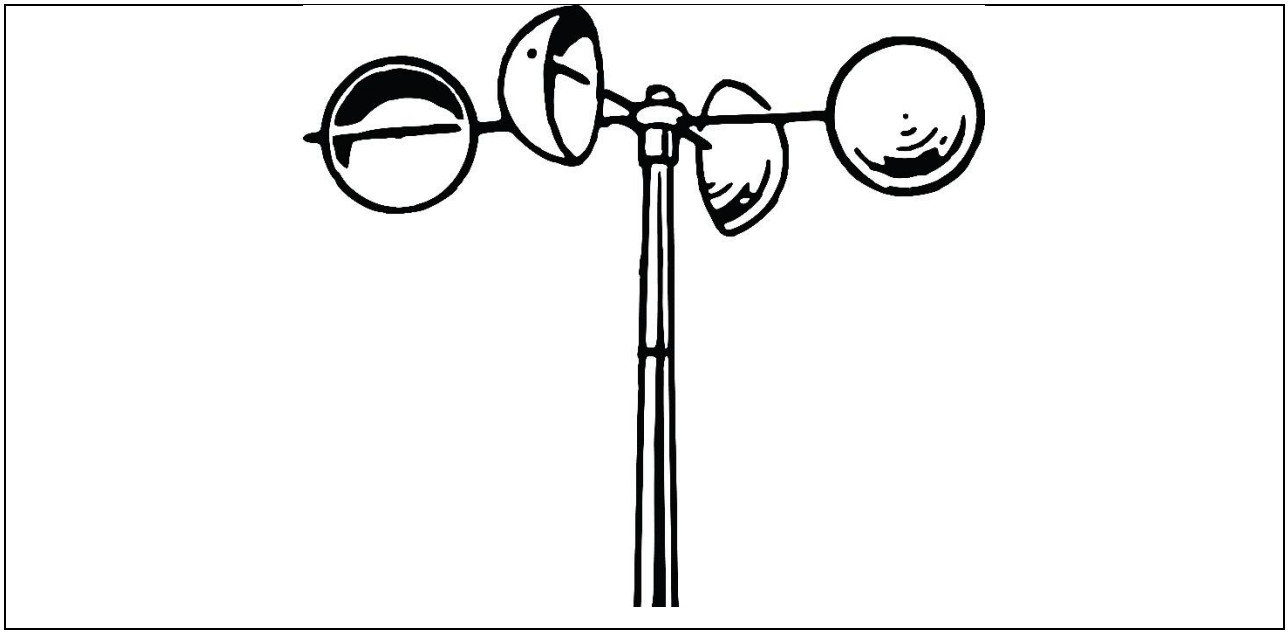
Science7VD4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7VD41a		1			7.5.1	1
Science7VD41b	1				7.5.1	1
Science7VD41c	3				7.5.1	3
Science7VD41d		2			7.5.1	2
Total marks	4	3				7

Item purpose

The question assesses understanding and application of knowledge.

Source(s)



Source information: Free Clipart Of A hemispherical cup anemometer to measure the wind speed

Question(s)

1

1(a) Identify the device shown in the picture.

(1 mark)

1(b) State its use.

(1 mark)

1(c) Explain the design of this device.

(3 marks)

1(d) Girdhari, the farmer, has grown trees as windbreaks in between the rows of crops. How are these windbreaks useful for his crops?

(2 marks)

(Total marks 7)

Mark scheme

1. 1 (a). Identify the device shown in the picture.	
Answer	Guidance
Anemometer (1)	
1 (b) State its use.	
Answer	Guidance
To measure wind speed. (1)	Accept: To measure wind direction (1) / wind pressure (1)
1 (c) Explain the design of this device.	
Answer	Guidance
An anemometer has spinning cups around a rod. (1) As the wind blows, the cups rotate making the rod spin. (1) An anemometer counts the number of rotations over a period of time and calculates the wind speed. (1)	
1 (d) Girdhari, the farmer, has grown trees as windbreaks in between the rows of crops. How are these windbreaks useful for his crops?	
Answer	Guidance
Windbreaks reduce the wind speed (1) and hence reduce soil erosion. (1)	Accept: Removal of top fertile layer from the field. (1)

Science7SZ1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SZ1	1				7.6.1	1

Item purpose

The question assesses knowledge and comprehension of the student of neutralisation reaction in soil.

Question(s)

1 (a) Identify one chemical from the solutions given below, used to neutralise soil, rich in organic matter.

A. Baking powder
B. Soap
C. Detergent
D. Slaked Lime

(1 mark)

Mark scheme

1. Identify one chemical from the solutions given below, used to neutralise soil, rich in organic matter.	
Answer	Guidance
1. option d,' slaked lime' is the correct answer as it is used as a base to neutralise soil which is acidic 2. option 'd' is the only correct answer and is given mark (1)	a. Option Baking soda is incorrect. Although it is a base it is not added to soil to neutralise acidity as excess of sodium is toxic for plants. b. option 'soap' is incorrect as it is highly toxic. c. option 'detergent' is incorrect as they are very toxic to the soil.

Science7SZ5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7SZ51a		1			7.6.1	1
Science7SZ51b		2			7.6.3	2
Total marks		3				3

Item purpose

The question assesses the ability of a student to investigate, relate and advise the chemical nature of the soil with crops to be grown.

Source(s)

Plant Preferences for pH

Very acid (pH 5.0 to 5.8)	Moderately acid (pH of 5.5 to 6.8)	Slightly acid (pH 6.0 to 6.8)	Very alkaline (pH 7.0 to 8.0)
azalea	bean	asparagus	acacia
blueberry	begonia	beet	bottlebrush
celeriac	Brussels sprouts	bok choy	cabbage
chickory	calla	broccoli	cauliflower
crabapple	camellia	gooseberry	celery
cranberry	carrot	grape	Chinese cabbage
eggplant	collard greens	kale	cucumber
endive	corn	kohlrabi	date palms
heathers	fuchsia	lettuce	dusty miller
huckleberry	garlic	mustard	eucalyptus
hydrangea	lima bean	muskmelon	geranium
Irish potato	parsley	oats	oleander
lily	pea	okra	olive
lupine	peppers	onion	periwinkle
oak	pumpkin	pansy	pinks
raspberry	radish	peach	pomegranate
rhododendron	rutabaga	peanut	salt cedar
rhubarb	soybean	pear	tamarisk
shallot	squash	peony	thyme
sorrel	sunflower	rhubarb	
spinach beet	tomato	rice	
spruce	turnip	spinach	
wild strawberry	viola	Swiss chard	
sweet potato			
watermelon			
white birch			

Question(s)

1. 1 You have to grow cucumbers on the soil where beans were grown last season.

   The soil is currently acidic.

1 (a) What treatment do you advise for the soil before sowing the seeds of cucumbers?

(1 mark)

1 (b) Identify any two crops which can be grown on the soil if the pH of the soil remains low and not treated after harvesting the beans.

(2 marks)

(Total marks 5)

Mark scheme

1 (a) What treatment do you advise for the soil before sowing the seeds of cucumbers?	
Answer	Guidance
neutralisation with slaked lime or quick lime.	
1 (b) Identify any two crops which can be grown on the soil if the pH of the soil remains low and not treated after harvesting the beans.	
Answer	Guidance
Any two from the table under a more acidic category.	

Science7DS4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS4	1				7.1.10	1

Item purpose

The question assesses knowledge of the kinds of images formed by concave and convex lenses.

Question(s)

1 (a) The image formed by a _____lens is always virtual.

(1 mark)

Mark scheme

1 (a) The image formed by a _____ lens is always virtual.	
Answer	Guidance
Concave	Accept only concave.

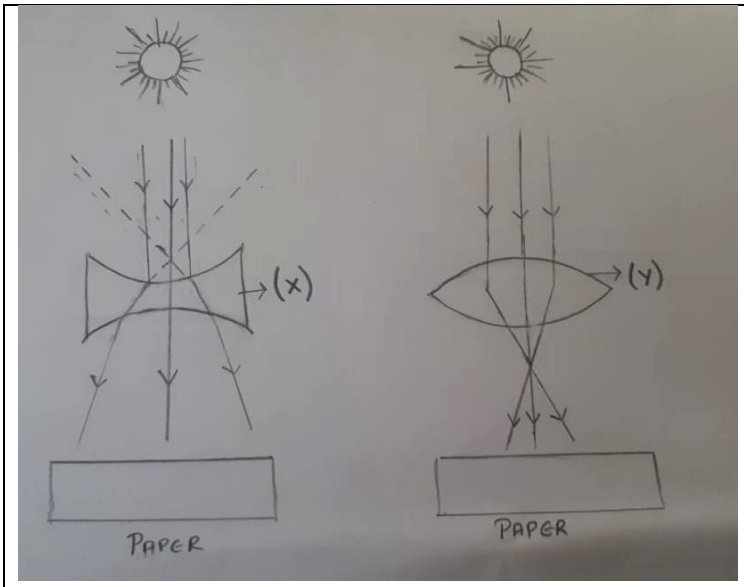
Science7LP5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7LP51a	1				7.1.9 Distinguish between concave and convex lenses	1
Science7LP51b	1				7.1.9 Distinguish between concave and convex lenses	1
Science7LP51c		2		2	7.1.9 Distinguish between concave and convex lenses	4
Science7LP51d	2				7.1.10 Distinguish between real and virtual images formed by lenses.	2
Total marks	4	2		2		8

Item purpose

The question assesses the student's ability to identify the type of lens and their properties relating to real world situations.

Source(s)



A student is asked to focus sunlight using two different lenses on to a paper. Observe the image carefully and answer the following questions.

Question(s)

1

1 (a) State the name for the shape of lenses X **and** Y.

(1 mark)

1 (b) Which of these two lenses can be used to magnify images?

(1 mark)

1 (c) Explain the changes that happen to the paper kept under both the lenses.

(4 marks)

1 (d) Differentiate between convex and concave lenses.

(2 marks)

(Total marks 8)

Mark scheme

1 (a). State the name for the shape of lenses X and Y.	
Answer	Guidance
X- Concave lens, Y-Convex lens (1 mark)	Give one mark only if both the lenses are identified. Accept ‘diverging’ for concave and ‘converging’ for convex.

1 (b) Which of these two lenses can be used to magnify objects?	
Answer	Guidance
Y/Convex lens.	Give 1 mark only if written as convex lens.
1 (c) Explain the changes that happen to the paper kept under both the lenses?	
Answer	Guidance
Paper kept under Y-convex lens, will start to burn (1) as the convex lens can focus all the light to the spot on the paper. (1 mark) Paper kept under X-Concave lens will not show any changes (1) as the concave lens diverges the light rays falling on it. (1 mark)	Must be clear that observation or explanation applies to correct lens.
1 (d) Differentiate between concave lens and convex lens.	
Answer	Guidance
1. Appearance: Concave lens is thinner in the middle and thicker at edges. Convex lens is thicker in the middle and thinner at the edges (1 mark) 2. Properties: Concave lens can diverge the light while convex lens can converge the light (1 mark) 3. Image formed: concave lens forms upright, virtual and small image while convex lens forms inverted, real, small image. (1 mark)	Give one mark for each point. Accept any two points mentioned. Accept: Concave lens can be called diverging lens and convex lens can be called converging lens.

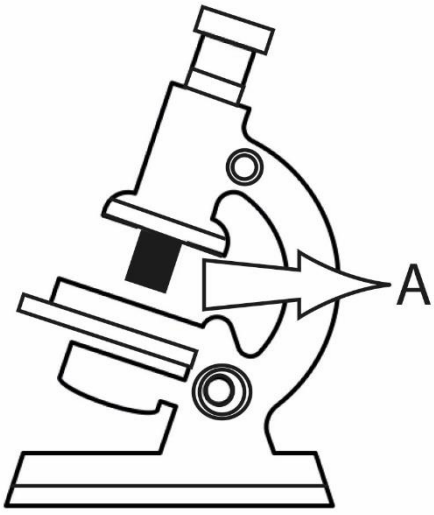
Science7LP2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7LP2	1				7.1.9 Distinguish between concave and convex lenses.	1

Item purpose

The question assesses student's ability to identify the convex and concave lenses.

Source(s)



Label A denotes the lens used in microscope to see objects.

Question(s)

1 Which type of lenses are used in the microscope which helps to see the microbes?

(1 mark)

Mark scheme

1. Which type of lenses are used in the microscope which helps to see the microbes?	
Answer	Guidance
Convex lenses (1 mark)	Accept only convex lens.

Science7DS1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS1		1			7.2.14	1

Item purpose

The question assesses the ability to identify the type of lens based on the characteristics of images formed.

Question(s)

1 While experimenting, Hema noticed a magnified and virtual image when the lens and an object are close. She noticed an inverted and real image when the lens is away from the object. Identify the type of lens used by her.

(1 mark)

Mark scheme

1 (a) While experimenting, Hema noticed a magnified and virtual image when a lens and an object are close. She noticed an inverted and real image when the lens is away from the object. Identify the type of lens used by her.	
Answer	Guidance
Convex lens 1 mark	Accept only convex lens.

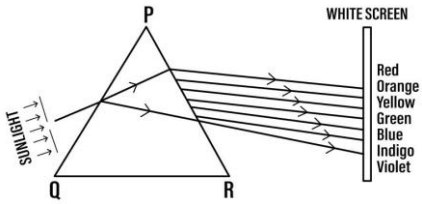
Science7LP4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7LP41a	1				7.2.15 Explain how a prism can be used to demonstrate that white light is composed of many colours of light.	1
Science7LP41b		2			7.2.15 Explain how a prism can be used to demonstrate that white light is composed of many colours of light.	2
Science7LP41c	3				7.5.7 Explain the construction and significance of a Newton's colour disc.	3
Total marks	4	2				6

Item purpose

The question assesses student's ability to demonstrate understanding of working of prism and Newton's disc

Source(s)



Question(s)

1

1 (a) What acts like a prism in the formation of a rainbow in nature?

(1 marks)

1 (b) What happens when we pass a red laser light through the prism?

(2 marks)

1 (c) Explain how to construct a Newton's disc and describe how it can be used to show that white light is made up of all colours.

(3 marks)

(Total marks 6)

Mark scheme

1 (a) What acts like a prism in the formation of rainbow in nature?	
Answer	Guidance
Rain drops suspended in atmosphere (1 marks)	Accept rain drops
1 (b) What happens when we pass a laser light through the prism?	
Answer	Guidance
1. No dispersion will be observed. (1 mark) 2. We can only see red light. Only white light can be dispersed to seven colours (1 marks)	1. Accept Prism can disperse only white light (1 mark) 2. Accept, we can only see red light. (1 marks)

1 (c) Explain how we can show that white light is made up of all colours using Newtons disc.	
Answer	Guidance
Procedure: Take a circular disc, Divide the disc into seven segments and paint them with the rainbow colours (1). Make a small hole at the centre of the disc and fix a stick or ball pen refill. Ensure the disc rotates freely. Rotate the disc. (1) Observation: When the disc rotates the colour gets mixed and the disc appears white (1 mark)	For writing procedure - first mark for colours, second mark for method to allow spinning (2 marks) For observation (1 mark)

Science7DS6

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS61a		2			7.2.15	2
Science7DS61b	2				7.5.7	2
Total marks	2	2				4

Item purpose

The question assesses the ability to explain splitting of white light using prism and to describe the construction and significance of Newton's disc.

Source(s)

Question(s)

1 (a) Some people like to hang a cut-glass crystal in their window. These results in rainbow-coloured lights appearing on white surfaces in the room. Explain why these colours appear when light passes through the crystal.

(2 marks)

1 (b) John made a Newton's disc with his teacher's guidance. Describe its construction and significance.

(2 marks)

(Total marks 4)

Mark scheme

1 (a) Some people like to hang a cut-glass crystal in their window. This results in rainbow-coloured lights appearing on white surfaces in the room. Explain why these colours appear when light passes through the crystal.	
Answer	Guidance
Any two from: The crystal acts like a prism (1) The colours appear due to dispersion of light. (1) When white light passes through the prism, it splits into seven colours. (1)	Accept sunlight or light in place of white light. Accept splitting of white light in place of 'dispersion'. Accept names of seven colours if written. Accept relevant points.

1 (b) John made Newton's disc with his teacher's guidance. Describe its construction and significance.	
Answer	Guidance
Any one from: Divide a circular disc into equal parts. (1) Paint each part with each colour I the rainbow. (1) AND And one from: When the Newton disc rotates fast, it looks whitish. (1) This proves that white colour consists of several colours. (1)	One mark from each section. Accept colour papers / colouring the disc with any other material in place of paints. Accept the colours are not visible / colours get mixed when it is rotated fast. Accept this proves that seven colours mix to form white colour.

Science7DS3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS3	1				7.6.10	1

Item purpose

The question assesses knowledge on properties of image formed by a simple telescope.

Question

1 A simple telescope having two convex lenses forms a _____ image.

A. diminished and inverted
B. diminished and upright
C. magnified and inverted
D. magnified and upright

(1 mark)

Mark scheme

1. A simple telescope having two convex lenses forms a _____ image. A. diminished and inverted B. diminished and upright C. magnified and inverted D. magnified and upright	
Answer	Guidance
D	Accept only D

Science7BS2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7BS2a		2			7.5.4	2
Science7BS2b	2				7.2.6	2
Science7BS2c			2		7.3.2	2
Total marks	2	2	2			6

Item purpose

The question assesses the utility of fuse and how is it useful.

Question(s)

1 (a) Which safety device is used in electric circuits to prevent overflow of current through them? Give a property of this device which makes it suitable for this purpose.

(2 marks)

1 (b) What is short-circuiting and what commonly causes it?

(2 marks)

1 (c) What is overloading? Why does it occur in a home?

(2 marks)

(Total marks 6)

Mark scheme

1 (a) Which safety device is used in electric circuits to prevent overflow of current through them and give the property of fuse wire.	
Answer	Guidance
Electric fuse Low melting point of wire	Fuse Melts and break the circuit.
1 (b) What is short-circuiting?	
Answer	Guidance
When current passes along an unintended path of low resistance. (1) Touching of wires leads to short circuiting. (1)	Wires come in contact with each other
1 (c) What is overloading? Why does it occur?	
Answer	Guidance
Too much current passing through a wire (1) More than one appliance or device connected to a single socket. (1)	Two or more devices in one socket.

Science7BS5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7BS5		1			7.2.6	1

Item purpose

The question assesses comparison of various metals on the basis of conductivity.

Question(s)

1 The filament in an electric bulb is made of tungsten. Suggest a property of tungsten, other than electrical conductivity, that makes it suitable for this purpose.

(1 mark)

Mark scheme

1 (a) Name the metal used in the filament of an electric bulb.	
Answer	Guidance
High melting point	High melting point prevents melting when electric current passes through.

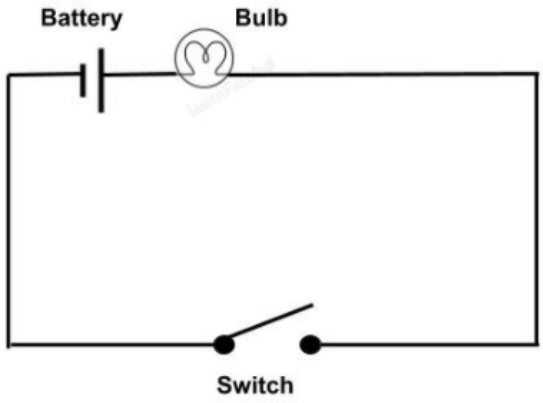
Science7BS1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7BS1a	1				7.5.2	1
Science7BS1	1				7.5.2	1
Science7BS1c		2			7.1.4	2
Science7BS1d	3				7.2.7	3
Total marks	5	2	0	0		7

Item purpose

The question assesses the various components of a circuit and the heating effect of current.

Source(s)



Question(s)

1 (a) What is the function of the switch in the circuit?

(1 mark)

1 (b) Name the two terminals of a battery.

(1 mark)

1 (c) Name the alloy used in the filament of bulb. Give its function.

(2 marks)

1 (d) i) In the given circuit name the component that must be hot to work.

ii) Give an example of a device other than a bulb which shows the heating effect of current?

(3 marks)

(Total marks 7)

Mark scheme

1 (a) What is the function of the switch in the circuit?	
Answer	Guidance
Completes the electric circuit / allows to turn off and on	i) On and Off Position of switch completes and breaks the circuit
1 (b) Name the two terminals of a battery.	
Answer	Guidance
Positive and negative (1)	Accept + and -
1 (c) Name the alloy used in the filament of bulb. Give its function.	
Answer	Guidance
Tungsten	
1 (d)(i) In the given circuit name the components that get heated up and the one which does not get heated up? (ii) Give an example of a device other than a bulb which shows the heating effect of current?	
i) (Filament of) bulb ii) Iron, Geyser, Heater	i) Bulb or filament ii) Any one example will do

Science7BS4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7BS4	1				7.5.3	1

Item purpose

The question assesses the knowledge of type of circuit present in the electric bell.

Question(s)

1 A common device that uses an electromagnet in its working is...

A. A tube light
B. A room heater
C. A geyser
D. An electric bell

(1 mark)

Mark scheme

1. A common device that uses electromagnet in its working is…	
Answer	Guidance
Option - d – An electric bell	It is an example of production of magnetism on passing the current; all other devices are simply converting current into heat or light.

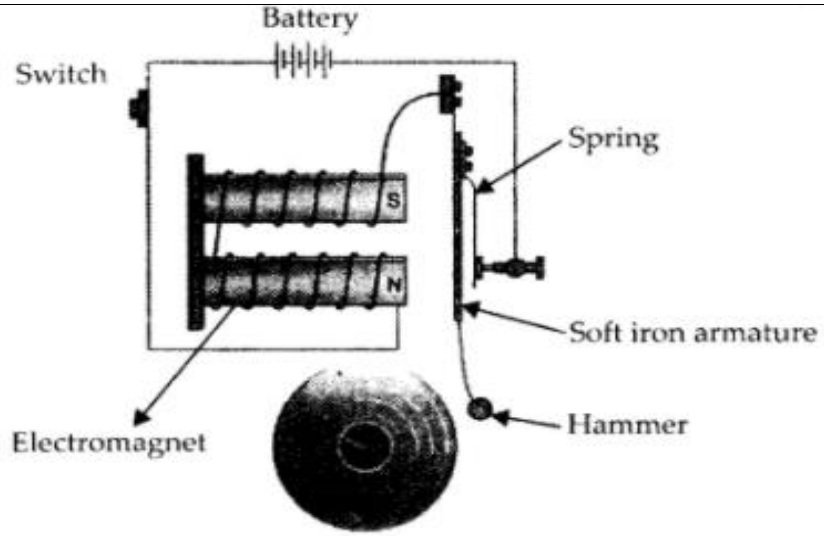
Science7BS3

Item identity	AO marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7BS31a				2	7.5.5	2
Science7BS31b		2			7.5.3	2
Science7BS31c		1			7.6.5	1
Total marks	0	3	0	2		5

Item purpose

The question assesses the knowledge of electromagnetism and its uses in daily life

Source(s)



Source information: NCERT Exemplar Class 7 Science Chapter 14 Electric Current and Its Effects

Question(s)

1 (a) As shown in the above picture why does the circuit acquire magnetism?

(1 mark)

1 (b) How can the magnetic strength of an electromagnet be increased?

(2 marks)

1 (c) Name two commercially used devices that work on electromagnetism?

(2 marks)

(Total marks 5)

Mark scheme

1 (a) As shown in the above picture why does the circuit acquires the magnetism?	
Answer	Guidance
Because current flows through the circuit (when the switch is closed)	
1 (b) How can the magnetic strength of an electromagnet be increased?	
Answer	Guidance
Magnetic strength can be increased by - Wrapping the insulated coil around the soft iron core (1) - increasing the no. of turns in the coil. (1) - Increasing the strength of current flowing through it. (1)	Max 2 marks
1 (c) Name two commercially used devices that works on electromagnetism?	
Answer	Guidance
Cranes, Telephones, Loudspeakers	Any two devices

Science7LP1

Item identity	AO1 marks	AO2 1 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7LP1		1			7.1.4 Distinguish conductors and insulators of heat.	1

Item purpose

The question assesses student's ability to distinguish conductors and insulators of heat.

Source(s)

Source information: Image by OpenClipart-Vectors from Pixabay

Question(s)

1 What kind of material can be used for the handle (labelled A)?

A. Copper
B. Wood

C. Iron
D. Stone

(1 mark)

Mark scheme

1 (a) What kind of material can be used for the handle (labelled A)?	
Answer	Guidance
B. Wood	Only wood is an insulator among the given options

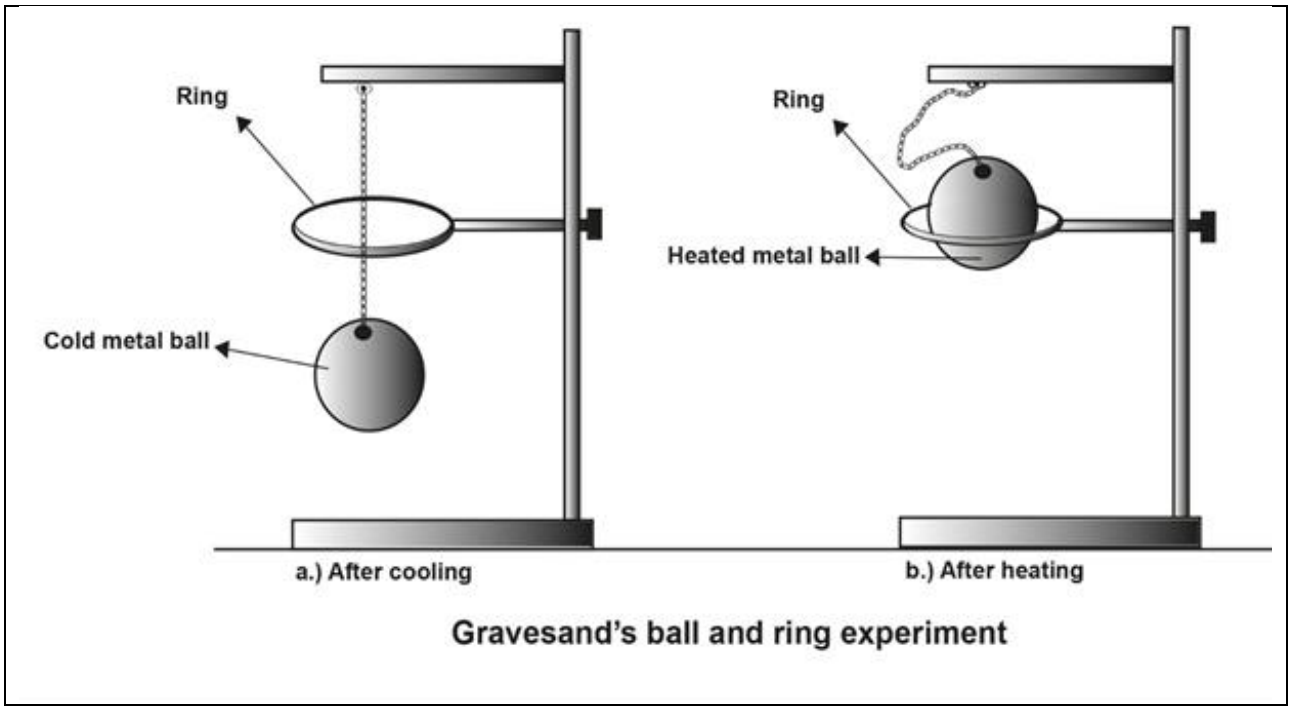
Science7DS7

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS71a	2				7.2.9	2
Science7DS71b		1			7.2.9	1
Science7DS71c		1			7.1.4	1
Total marks	2	2				4

Item purpose

The question assesses the ability to analyse experiments on thermal expansion of solids. It assesses the ability to identify scientific principles involved in real life applications. It also assesses the ability to identify conductors and insulators.

Source(s)



Question(s)

1 (a) Explain the outcome of the above experiment

(2 marks)

1 (b) Railway tracks have gaps between the ends. Identify the scientific principle involved in this.

(1 mark)

1 (c) Most railway tracks are built from pieces of steel supported by wooden planks. Identify the conductor and the insulator in this case.

(1 mark)

(Total marks 4)

Mark scheme

1. 1 (a) Explain the outcome of the above experiment	
Answer	Guidance
When heated, the metal in the ring <u>expands</u> (1) This means the ball no longer <u>fits</u> through the hole (1)	Accept alternative wording if *idea* of expansion and fit are included.
1 (b) Railway tracks have gaps between the ends. Identify the scientific principle involved in this.	
Answer	Guidance
Any one from:	Accept solids expand when temperature increases, or solids expand on heating.

The scientific principle involved is the thermal expansion of solids. The tracks heat up and expand when used	
1 (c) Most railway tracks are built from pieces of steel supported by wooden planks. Identify the conductor and the insulator in this case.	
Answer	Guidance
Steel is a conductor and wooden plank is an insulator. 1 mark	Do not accept any other answer.

Science7DS2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS2		2			7.1.4	2

Item purpose

The question assesses the knowledge of conductors and insulators.

Question(s)

1 (a) Why does our hand burn on touching a hot pan, but not on touching its bakelite handle?

(2 marks)

Mark scheme

1 (a) Why does our hand burn on touching the hot pan, but not on touching its bakelite handle?	
Answer	Guidance
Pan is a conductor of heat. Bakelite is not a conductor of heat.	Accept pan is made up of conducting material or heat passes through pan. Accept bakelite is a poor conductor of heat or it is an insulator or heat doesn't pass through bakelite. Accept relevant answer.

Science7LP3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7LP31a	1				7.2.8 Explain the flow of heat from hotter to cooler areas.	1
Science7LP31b	1				7.2.8 Explain the flow of heat from hotter to cooler areas.	1
Science7LP31c			2		7.2.8 Explain the flow of heat from hotter to cooler areas.	2
Science7LP31d				2	7.6.6 Explain the use of domestic insulation as a means of reducing heat loss or gain and thus reducing energy consumption.	2
Total marks	2		2	2		6

Item purpose

The question assesses the student's ability to identify and explain heat transfer process in real life situations.

Source(s)

Question(s)

1

1 (a) By what method of heat transfer does heat energy from the sun reach the earth?

(1 mark)

1 (b) Select the process of heat transfer which causes a breeze (wind) over land and sea.

A. Conduction
B. Convection
C. Radiation

(1 marks)

1 (c) Explain in terms of heat transfer why houses at coastal areas often have their windows facing the sea?

(2 marks)

1 (d) Suggest two domestic insulation techniques that the houses build at coastal areas could have to maintain constant temperatures.

(2 marks)

(Total marks 6)

Mark scheme

<table>
<tr><td colspan="2">1 (a) By what method of heat transfer does heat energy from the sun reach the earth?</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>Radiation (1 mark)</td><td>Accept only radiation.</td></tr>
<tr><td colspan="2">1 (b) Select the process of heat transfer which causes a breeze (wind) over land and sea.

A. Conduction
B. Convection
C. Radiation</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>B. Convection (1 mark)</td><td>Accept only convection.</td></tr>
<tr><td colspan="2">1 (c) Explain why houses at coastal areas have their windows facing the sea</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>1. To receive the cool sea breeze. (1 marks)
2. Cool air from the sea moves towards the land to replace warm air by convection. (1 marks)</td><td>1. Sea breeze should be mentioned (1 mark)
2. Mark is for reference to a convection of air (1 mark)</td></tr>
<tr><td colspan="2">1 (d) Suggest two domestic insulation techniques that the houses build at coastal areas can have to prevent loss or gain of heat</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>1. Use hollow blocks as it can create air pockets to trap air. (1 mark)
2. Can colour the exterior walls of the house with lighter colours as light colours absorb less heat. (1 mark)
3. Any valid point</td><td>Accept any two points.</td></tr>
</table>

Science7DS5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7DS51a		1			7.2.9	1
Science7DS51b	1				7.3.4	1
Science7DS51c				2	7.6.6	2
Science7DS51d		2			7.2.8	2
Total marks	1	3		2		6

Item purpose

The question assesses the ability to identify the direction of heat flow between substances.

The question assesses the ability to recall the device used to measure temperature of liquids in laboratory thermometer.

The question assesses the ability to advise ways to reduce energy consumption and justify the answer.

The question assesses the ability to explain the application of science in real life situations.

Question(s)

1 (a) David noticed that his mother placed a hot milk container in some cold water to cool the hot milk. Explain why this causes the milk to cool.

(1 mark)

1 (b) David wants to measure the temperature of hot and cold water in his science lab. Name the device that can be used for this purpose.

(1 mark)

1 (c) David wants to reduce the energy consumption of his air conditioner

painting the outside of his house black. Is this a good idea? Justify your answer.

(2 marks)

1 (d) David wants to know why room heaters are fixed near the floor, not near the top of the wall. Explain why.

(2 marks)

(Total marks 6)

Mark scheme

1 (a) David noticed that his mother placed a hot milk container in some cold water to cool the hot milk. Explain why this causes the milk to cool	
Answer	Guidance
Heat transferred from milk to water (1)	Accept milk lost heat and water gained heat.
1 (b) David wants to measure the temperature of hot and cold water in his science lab. Name the device that can be used for this purpose.	
Answer	Guidance
Thermometer (1)	
1 (c) David wants to reduce the energy consumption of his air conditioner painting the outside of his house black. Is this a good idea? Justify your answer.	
Answer	Guidance
No (no mark)	

The black colour will absorb more heat (1) This will increase the temperature of the house (and thus the energy consumption of the air conditioner) (1)	
1 (d) David wants to know why room heaters are fixed near the floor, not near the top of the wall. Explain why.	
Answer	Guidance
Any two from: • hot air rises. (1) • Because it is less dense (1) • This helps with heating the room faster. (1) • If the room heater is placed near the top of the wall, hot air doesn't move down. (1) • This establishes a convection current (1)	

Science7ARP5

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
SCIENCE7ARP5	1				7.1.6	1

Item purpose

The question assesses understanding and application of knowledge to find the answer.

Question(s)

1 A food chain is a linear network of living organisms through which energy is transferred in the form of food. All green plants which are capable of making their own food by photosynthesis are called

A. Producers
B. Consumers
C. Decomposers
D. Scavengers

(1 mark)

Mark scheme

1 Food chain is a linear network of living organisms through which energy is transferred in the form of food. All green plants which are capable of making their own food by photosynthesis are called. A. Producers B. Consumers C. Decomposers D. Scavengers	
Answer	Guidance
A. Producers	Option: A only

Science7MBSA1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7MBSA1	1				7.1.6	1

Item purpose

The question assesses the knowledge of saprophytes with example.

Source(s)

Question(s)

1 Choose the correct option.

Mushrooms are an example of...

A. autotrophs
B. heterotrophs
C. parasites
D. saprophyte

(1 mark)

Mark scheme

1. Choose the correct option.
Mushrooms are example of...

A. autotrophs
B. heterotrophs
C. parasites
D. saprophytes

Answer	Guidance
D. saprophytes	Do not accept any other answers.

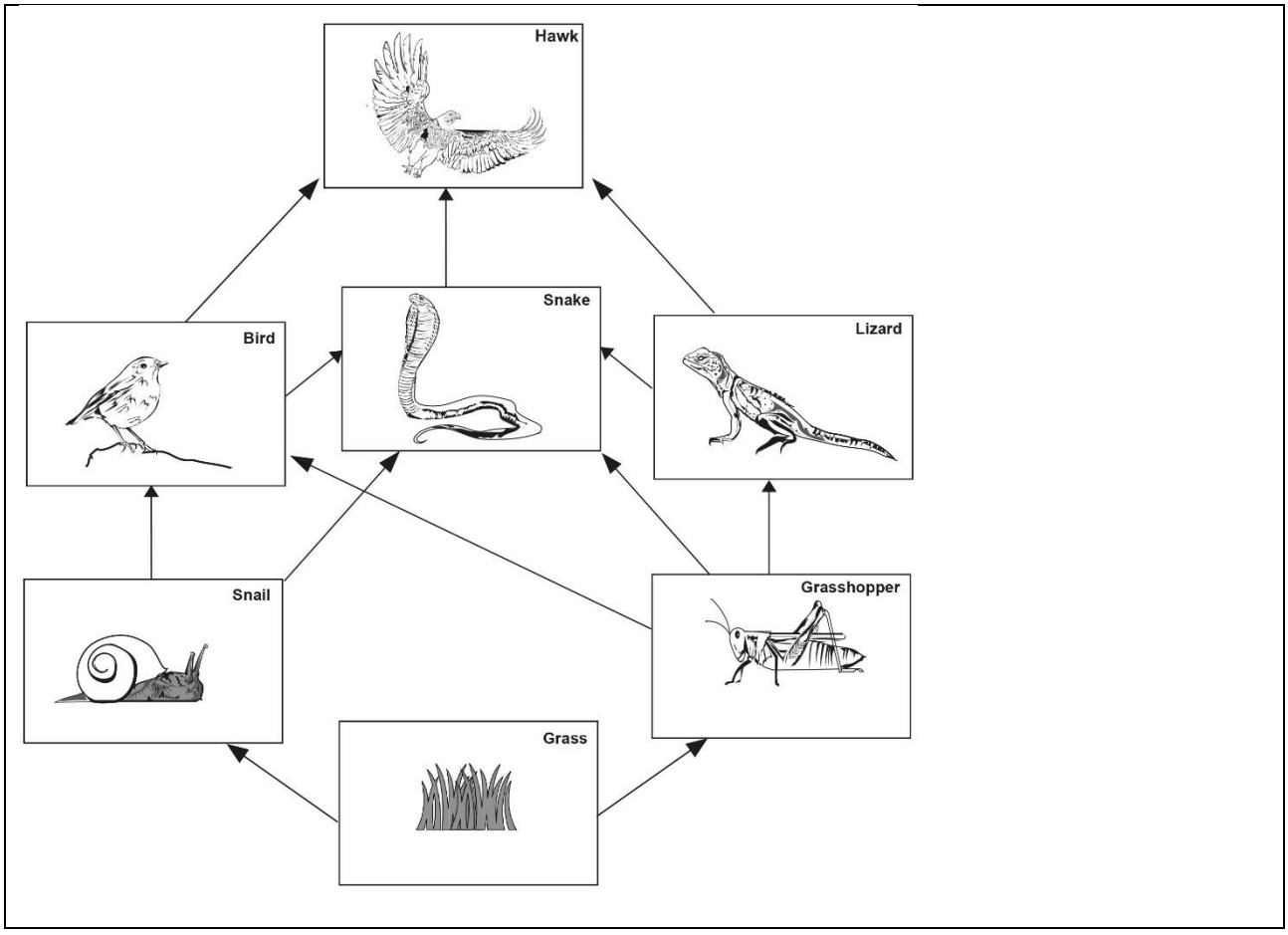
Science7EVR1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7EVR1	1				7.1.6	1

Item purpose

The question assesses a student's basic knowledge of categorization of organisms based on their method of feeding.

Source(s)



Question(s)

1 Use the information in the figure above, identify a secondary consumer.

A. Hawk
B. Snail
C. Snake

(1 mark)

Mark scheme

1 Use the information in the figure above, identify a secondary consumer. A. Hawk B. Snail C. Snake	
Answer	Guidance
Option C.	Accept option C or Snake

Science7ARP6

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
SCIENCE7ARP6	1				7.1.7	1

Item purpose

The question assesses application of knowledge to identify and write the correct name of the teeth.

Question(s)

1 State the name of the tooth being described in the following passage:

There are four of them. Two are in the maxillary arch and two are in the mandibular area. They are behind the lateral incisors and have a single cusp and a single root (longest from any other tooth). Their main function is to pierce and tear flesh.

(1 mark)

Mark scheme

1 State the name of the tooth being described in the following passage: There are four of them. Two are in the maxillary arch and two are in the mandibular area. They are behind the lateral incisors and have a single cusp and a single root (longest from any other tooth). Their main function is to pierce and tear flesh.	
Answer	Guidance
Canine	Correct answer only

Science7MB1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7MB1a	1				7.1.7	1
Science7MB1b		2			7.3.6	2
Science7MB1c	1				7.1.7	1
Science7MB1d		2			7.3.6	2
Total marks	2	4				6

Item purpose

The question assesses the understanding of human teeth and ways to keep them healthy.

Question(s)

1

1 (a) Which teeth are also known as cutting teeth?

(1 mark)

1 (b) Give any one difference between canines and premolars with one example of animals each having canines and premolars.

(2 marks)

1 (c) State the main cause of tooth decay.

(1 marks)

1 (d) Suggest two important ways to keep our teeth healthy.

(2 marks)

(Total marks 6)

Mark scheme

<table>
<tr><td colspan="2">1 (a) Which teeth are known as cutting teeth? (1 marks)</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>1 mark
Incisors are known as cutting teeth.</td><td>Accept below answers or relevant answer with keyword Incisors.
Incisors are called as cutting teeth.
Incisors are cutting teeth.
Incisors
Incisor</td></tr>
<tr><td colspan="2">1 (b) Give any one difference between canines and premolars with one example each of animals with canines and with premolars. (2 marks)</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>1 mark for differentiating canine and 1 mark for Example<table><tr><td></td><td>Canines</td><td>Premolars</td></tr><tr><td>1</td><td>Canines are sharp.</td><td>Premolars are flat.</td></tr><tr><td>2</td><td>Example: Carnivores</td><td>Example: Herbivores</td></tr></table></td><td>Accept the below or any other relevant answers.<table><tr><td></td><td>Canines</td><td>Premolars</td></tr><tr><td>1</td><td>Canines are sharp.</td><td>Premolars are flat.</td></tr><tr><td>2</td><td>Canines help to tear food.</td><td>Premolar help to chew food.</td></tr><tr><td>4</td><td>Canines are known as cuspids.</td><td>Premolars are known as bicuspids.</td></tr></table></td></tr>
</table>

	5	There are 4 canines in human mouth.	There are 8 premolars in human mouth.
	2	Example: Carnivores, Omnivores, Tiger, Dog, Human beings or any other examples other than herbivores	Example: All Herbivores, carnivores, Omnivores except infants

1 (c) Write the main cause of tooth decay. (1 mark)

Answer	Guidance
1 mark Eating too many sugary or acidic foods and drinks and not cleaning the teeth properly causes tooth decay.	Accept the below or any other relevant answers. • Eating too many sugary foods like sweets and chocolates. • Eating acidic foods • Taking fizzy drinks/cokes etc. • Not cleaning the teeth after eating/ drinking • Not brushing the teeth properly • Not maintaining adequate oral hygiene • The presence of acidic substances produced by bacteria on the teeth.

1 (d) Suggest two important ways to keep our teeth healthy.

Answer	Guidance
2 marks We can keep our teeth healthy by • Brushing our teeth (1) • Avoiding too much sugary food / fizzy drinks. (1)	Accept the below or any other relevant answers. • We can keep our teeth healthy by brushing them properly twice a day.

	• Eat less sweets, chocolates and pastries. • Avoid/ drink less fizzy drinks. • Avoid acidic food. • Visit dentist at least once a year. • Eat a balanced diet and more calcium rich foods. • Avoid junk food. • Avoid eating food after brushing at night. • Clean mouth with water after eating/ drinking any food items.

Science7ARP1

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7ARP1a	1				7.1.8	1
Science7ARP1b		2			7.1.8	2
Science7ARP1c			2		7.1.8	2
Total marks	1	2	2			5

Item purpose

The question assesses understanding, analysis, application and ability to develop critical thinking about parts of the flower and their roles.

Source(s)

Source information: Website: intl.siyavula.com

Question(s)

1 Observe the diagram of the flower given above and answer the following questions:

1 (a) A flower is a reproductive part of the plant. It has four different parts.

Label the male reproductive part in the given diagram of flower.

(1 mark)

1 (b) A student was given some flowers to identify in the laboratory and asked to separate the flowers into two groups. The first group of flowers had both stamens and pistils (carpels). The second group of flowers had either the stamens or carpels missing. State the names given to the first **and** second group of flowers.

(2 marks)

1 (c) Normally petals are coloured and sepals are green. Explain these observations.

(2 marks)

(Total marks 5)

Mark scheme

1 (a) A flower is a reproductive part of the plant. It has four different parts. Label the male reproductive part in the given diagram of flower	
Answer	Guidance
The long-elongated thread-like structures and the third whorl are the male part of the flower.	correct labelling only for male part of the flower.
1 (b) A student was given some flowers to identify in the laboratory and asked to separate the flowers into two groups. The first group of flowers had both stamens and pistils (carpels). The second group of flowers had either the stamens or carpels missing. State the names given to the first and second group of flowers.	
Answer	Guidance
First group: <u>bisexual</u> flowers (1) Second group: <u>unisexual</u> flowers	Clear separation of flowers on the basis of presence or absence of reproductive parts.

1 (c) Petals are coloured, and sepals are green generally in a flower. Explain.	
Answer	Guidance
Coloured petals attract insect pollinators (1) Green sepals allow for photosynthesis (1)	colour in petals help to attract insects and chlorophyll in sepal help to prepare food for plant

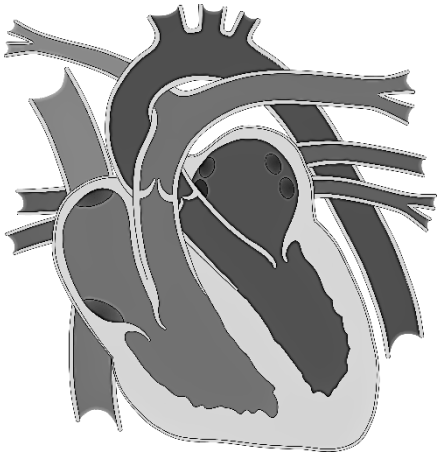
Science7ARP2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7ARP21 a	1				7.2.10	1
Science7ARP21 b		1			7.2.10	1
Science7ARP21 c	1				7.2.10	1
Science7ARP21 d				2	7.2.10	2
Total marks	2	1		2		5

Item purpose

The question assesses analysis, application of knowledge, investigation and inquisitiveness.in transportation of blood in the human body

Source(s)



Source information: Website: creazilla.com

Question(s)

1 Observe the given diagram above and answer the questions below:

1 (a) Name the largest artery, which displays all characteristics given below:

A. High oxygen content
B. Low carbon dioxide concentration
C. High blood pressure

(1 mark)

1 (b) Sometimes when have a blood test, you observe that the technician collects the blood from the superficial vessels, not from a deeply situated vessel. Name this superficial vessel.

(1 mark)

1 (c) Explain the role of the valves present between the two chambers of the heart named as atrium and ventricle.

(1 mark)

1 (d) A girl got injured while playing and blood started oozing out of the wound. After some time, a dark red clot had plugged the cut and the bleeding stopped. Explain the reason for this observation.

(2 marks)

(Total marks 5)

Mark scheme

1 (a) Name the largest artery which displays all characteristics given below: A. High oxygen content B. Low carbon dioxide concentration C. High blood pressure	
Answer	Guidance
Aorta	The blood vessel which carries oxygenated blood from the left ventricle and distribute to all body parts.
1 (b) Sometimes when have a blood test, you observe that the technician collects the blood from the superficial vessels, not from a deeply situated vessel. Name this superficial vessel.	
Answer	Guidance
Vein	Correct answer
1 (c) Explain the role of the valves present between the two chambers of the heart named as atrium and ventricle.	
Answer	Guidance
valves prevent the backflow of blood.	valves are flap like structures act as one-way inlets and outlets of blood.
2 A girl got injured while playing and blood started oozing out of the wound. After some time, a dark red clot had plugged the cut and the bleeding stopped. Explain the reason for this observation.	
Answer	Guidance
Formation of clot takes place because of the presence of platelets (1) in the blood (2).	function of platelets is to prevent bleeding. Allow: reference to fibrin or fibrinogen

Science7MB2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7MB21a	2				7.2.10	2
Science7MB21b	2				7.2.10	2
Science7MB21c		1			7.6.7	1
Total marks	4	1				5

Item purpose

The question assesses the knowledge and understanding of circulatory system.

Source(s)

Question(s)

1

1 (a) What are the organs involved in the circulatory system?

(2 marks)

1 (b) State two important functions of the circulatory system.

(2 marks)

1 (c) Explain how a stethoscope can be used to identify health conditions.

(1 mark)

(Total marks 5)

Mark scheme

<table>
<tr><td colspan="2">1 (a) What are the organs involved in circulatory system?</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>(2 marks)
Heart, Blood vessels</td><td>Assign 2 marks for writing all the three organs and 1 mark for any two organs.</td></tr>
<tr><td colspan="2">1(b) State two important functions of circulatory system.</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>(2 marks)
carries of oxygen and nutrients to all the body parts.
carries carbon dioxide and metabolic waste from the body parts.</td><td>Assign 2 marks for 2 points and 1 mark for 1 point.

Accept the below or any other relevant answers.
Carries hormones
Carries nutrients from the small intestine to all the body part.
Carries food to all the body parts.
Carries oxygen from lungs to all the body parts.
Carries carbon dioxide from cells to lungs
Carries waste matters from cells for removal.</td></tr>
<tr><td colspan="2">1 (c) Explain how a stethoscope can be used to identify health conditions.</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>(1 mark)

A stethoscope can be used to identify health conditions such as fast or irregular heartbeats.</td><td>Assign 1 mark for any one point.

Accept the below or any other relevant answers.</td></tr>
</table>

	• Stethoscope can be used to identify rate of heart beats. • Stethoscope can be used to identify irregular heartbeats. • Stethoscope can be used to identify health conditions such as fast or slow heart beats. • Stethoscope can be used to find out if the heart beats are normal. • Stethoscope are used to check heartbeat of a sick person.

Science7EVR3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7EVR31a		2	1		7.4.1	3
Science7EVR31b		2			7.2.10	2
Science7EVR31c		3			7.2.10	3
Science7EVR31d	2				7.2.12	2
Total marks	2	7	1			10

Item purpose

The questions assess the basic knowledge in the structure and function of mammalian body parts & effect of exercise of heart and breathing rates, in terms of the need for oxygen for respiration.

Source(s)

Fig 1

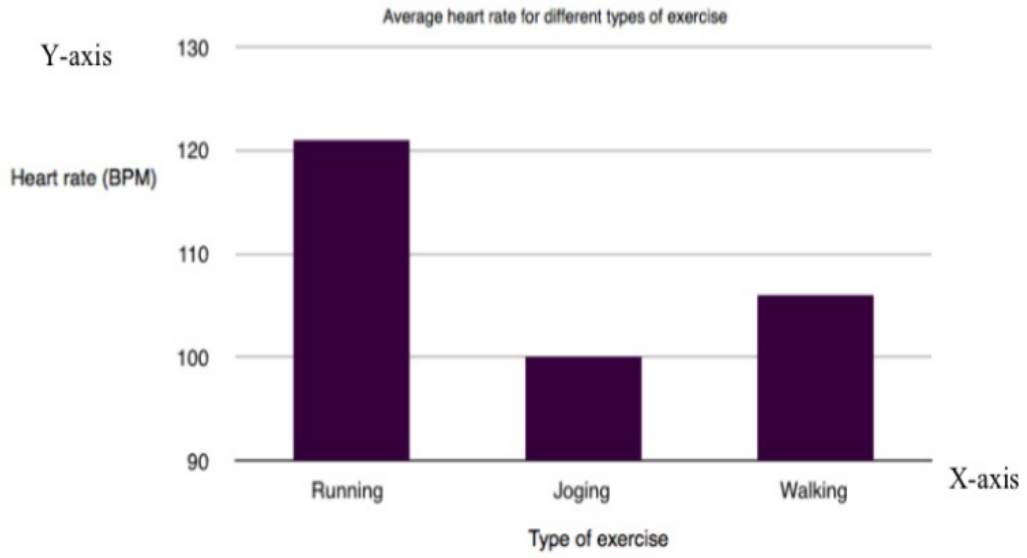


Fig 2

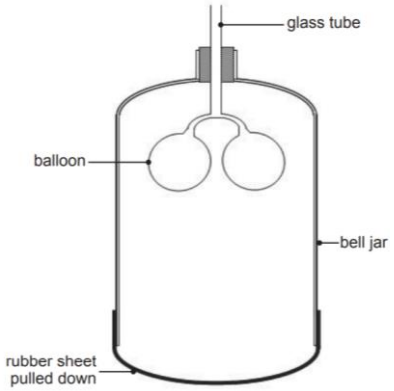
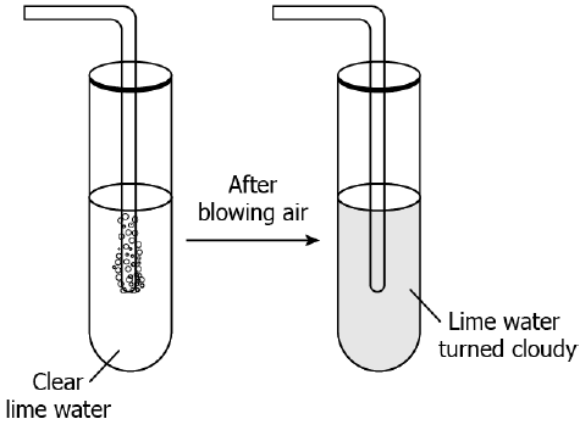


Fig 3



Source information: savemyexams.co.uk; CBSE TERM Manual Class VII science

Question(s)

1

1 (a) Fig. 1 is experimental data on 50 students and drawn as a bar graph.
It is evident from the above that the heartbeat rose more after running.
Explain why the heartbeat rate increases during exercise?

(3 marks)

1 (b) Fig. 2 is the model of respiratory system.
Name the parts of the respiratory system represented by glass tube and

rubber sheet.

(2 marks)

1 (c) Explain what would happen to the balloons if the rubber sheet is pushed up in the above figure?

(3 marks)

1 (d) Students were asked to blow air into a test tube containing lime water with the help of a straw. The observation of the experiment is shown in Fig. 3.

State the reason for Lime water turning cloudy.

(2 marks)

(Total marks 10)

Mark scheme

1(a) The above is experimental data on 50 students and drawn as a bar graph. It is evident from the above that the heartbeat rose more after running. Explain why the heartbeat rate increases during exercise?	
Answer	Guidance
• During exercise muscles require energy at a faster rate, as they are carrying out a lot of work. • The amount of oxygen and glucose needed by the cells increases, so that they can transfer energy more quickly. • The heart pushes blood at a faster rate to the cells.	Award full marks for the alternative answers provided below: • During exercise the body requires extra energy. (1M) • As a result, more oxygen is required to our cells. (1M) • We inhale more oxygen and breathe faster. (1M) In any answer full marks may be awarded for the following 3 major points: • Requirement of more energy by the cells (1M) • Cells need more oxygen/glucose (1M

	• The heart pushes more blood/inhale more oxygen. (1M)
1 (b) The above is the model of respiratory system. Name the parts of the respiratory system represented by glass tube and rubber sheet.	
Answer	Guidance
Glass Tube: Trachea Rubber Tube: Diaphragm	Full credit (1M) even if student writes 'Windpipe' instead of 'Trachea'. No credit for any other answers
1 (c) Explain what would happen to the balloons if the rubber sheet is moved down?	
Answer	Guidance
Explanation: • When rubber sheet moves down, the volume inside the glass jar increases. • This increase in volume causes a decrease in pressure. • The balloons inflate as air enters until the pressures inside and outside are equal.	Alternately if the student writes: • Due to Boyle's law the rubber balloon inflates (3M) • Due to differences in Pressure and Volume, the rubber balloon inflates (3M) Partial credit for the following: • Due to Boyle's law (only 2M) • Rubber Balloon inflates (only 1M)
1 (d) Students were asked to blow air into a test tube containing lime water with the help of a straw. The observation of the experiment is shown in the image. State the reason for Lime water to turn cloudy.	
Answer	Guidance
• Blown (exhaled air) contains carbon di oxide • Carbon di oxide reacts with lime water to turn it cloudy	If the student writes: • Carbon di oxide reacts with Lime water to turn it cloudy (2M) • Blown air reacts with Lime water to turn it cloudy (only 1M)

Science7MBSA2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7MBSA2	1				7.2.11	1

Item purpose

The question assesses the understanding of parts of a flower.

Question(s)

1 (a) Choose the correct option.

All the petals of a flower together are called...

A. sepal
B. calyx
C. corolla
D. perianth

(1 mark)

Mark scheme

1. Choose the correct option. All the petals of a flower are called... A. sepal B. calyx C. corolla D. perianth	
Answer	Guidance
C. corolla	Do not accept any other answers.

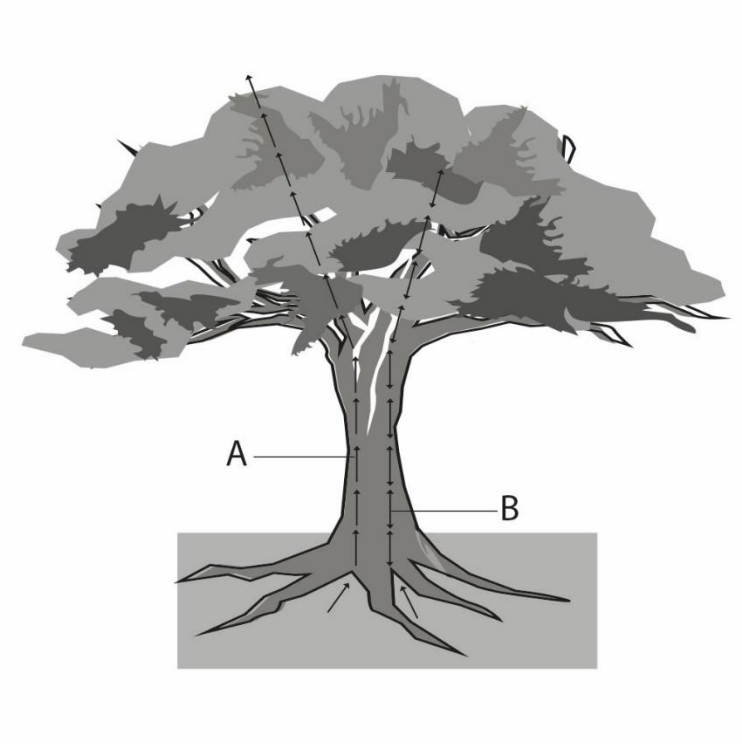
Science7EVR2

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7EVR2	1				7.2.11	1

Item purpose

The question assesses the understanding and functioning of plant organs.

Source(s)



Question(s)

1 State the function of the vascular tissue labelled as A in the above figure?
(1 mark)

Mark scheme

1 State the function of the vascular tissue labelled as A in the above figure?	
Answer	Guidance
It transports water and nutrients from the roots to ariel parts of the plant.	Award 1M even if student mentions: Carries water or nutrients or both

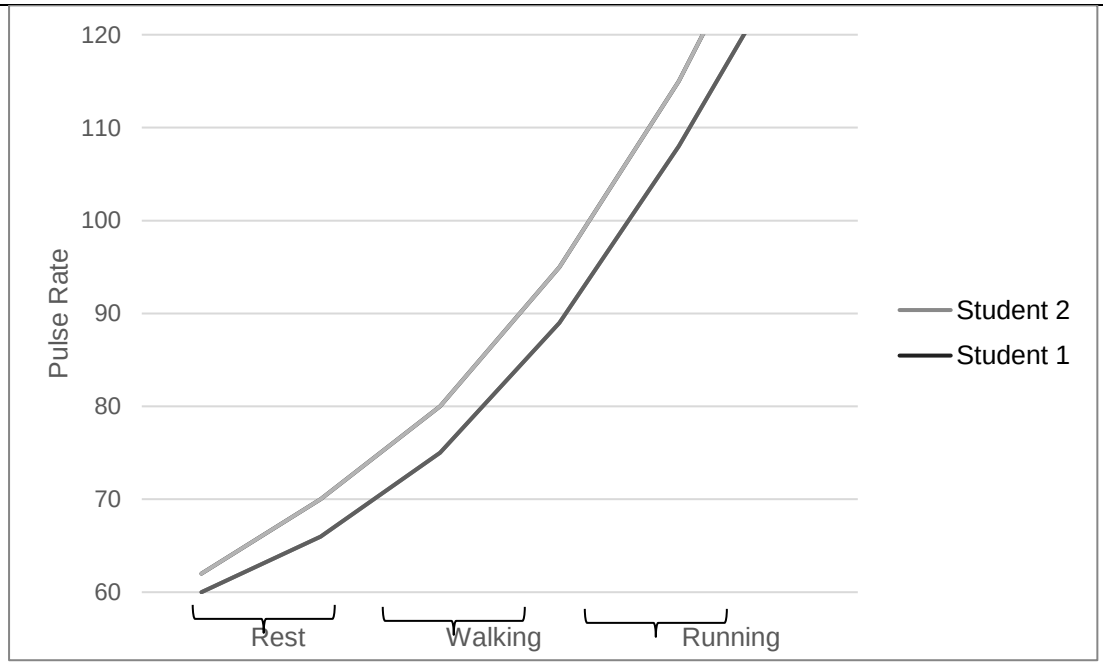
Science7ARP3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
SCIENCE7ARP31 a	2				7.2.12	2
SCIENCE7ARP31 b	1				7.2.12	1
SCIENCE7ARP31 c		2			7.2.12	2
SCIENCE7ARP31 d	1				7.2.12	1
Total marks	3	2				5

Item purpose

The question assesses knowledge, application, interpreting information, and help in additional learning

Source(s):



Question(s)

1 ‘Breathing rate’ means the number of times a person breathes per minute. During breathing, inhalation and exhalation take place alternately. One inhalation plus one exhalation completes a single breath.

1 (a) Explain why the breathing rate increases during strenuous exercise.

(2 marks)

1 (b) When we exercise vigorously, the breathing rate increases, and heart rate also increases. In this process, exhalation is also a very important part of exercise. Explain the importance of exhalation.

(1 mark)

1 (c) A teacher in the class assigned two students a task to compare the effect of physical activities on pulse rate. Students carried out a practical activity and collected class data. From this, they produced the graph above, which contains data at rest, brisk walking and fast running. Describe and explain the results of the investigation.

(2 marks)

1 (d) Suggest one aerobic breathing activity which can increase the capacity of lungs to take in more air.

(1 mark)

(Total marks 5)

Mark scheme

1 (a) Explain why the breathing rate increases during strenuous exercise.	
Answer	Guidance
More muscle contraction (1) So more respiration (1) So more oxygen required (1) And more carbon dioxide produced (1) So increased breathing rate (1)	2 max
1 (b) When we exercise vigorously, the breathing rate increases, and heart rate also increases to meet the increased demand of more efficiency of body muscles. In this process, exhalation is also a very important part of exercise. Explain the importance of exhalation.	
Answer	Guidance
To get rid of carbon dioxide	Accept: removal of low-oxygen air from lungs.
1 (c) A teacher in the class assigned two students a task to compare the effect of physical activities on pulse rate. Students carried out a practical activity and collected class data. From this, they produced a graph, which contains data at rest, brisk walking and fast running. Describe and explain the results of the investigation.	
Answer	Guidance
The two students got similar results (1) Because following similar method (1) And same age/sex (1) The pulse rate increases with more vigorous exercise (1) Because need for more oxygen (1) (Max 2 marks)	Physical activities increase pulse rate.

1 (d) Suggest one aerobic breathing activity which can increase the capacity of the lungs to take in more air.	
Answer	Guidance
Running/swimming/cycling/ any valid cardio exercise	Accept any activity that increases the breathing rate.

Science7ARP4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
SCIENCE7ARP 41a	1				7.2.13	1
SCIENCE7ARP 41b		1			7.2.13	1
SCIENCE7ARP 41c	1				7.2.13	1
SCIENCE7ARP 41d	1				7.2.13	1
Total marks	3	1				4

Item purpose

The question assesses identification, recall knowledge, drawing, labelling and analysis of findings about reproduction.

Source(s):

Fig 1

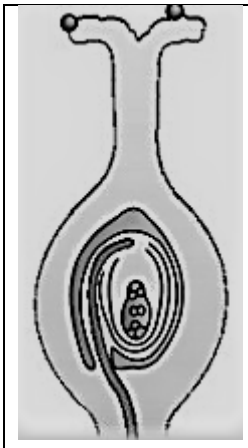


Fig 2

Source information: https://www.toppr.com/ask/content/story/amp/modes-of-vegetative-propagation-113026/

http://aven.amritalearning.com/index.php?sub=100&brch=293&sim=1485&cnt=3423

Question(s)

1 (a) Figure 1 depicts a common type of asexual reproduction, in which new plants are produced from body parts like roots, stems and leaves. Name this method of reproduction.

(1 mark)

1 (b) One day while doing ground observation in school, a student of class 7th noticed some unknown type of plants growing in the garden which were not there last week, and which nobody had planted. Explain how the plants could have appeared.

(1 mark)

1 (c) In figure 2 show the path of the pollen grain from falling on the stigma and reaching to the embryo sac.

(1 mark)

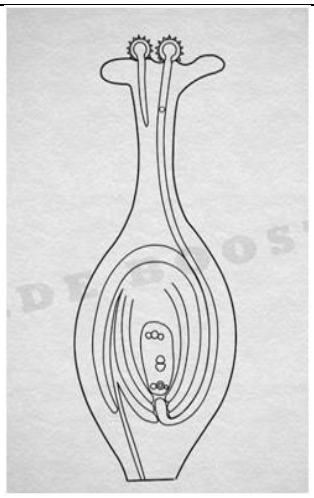
1 (d) Which part of this plant will form the future plant?

(1 mark)

(Total marks 4)

Mark scheme

1 (a) The given figure depicts a common type of asexual reproduction, in which new plants are produced from body parts like roots, stems and leaves. Name this method of reproduction.	
Answer	Guidance
Vegetative propagation	
1 (b) One day while doing ground observation in school, a student of class 7th noticed some unknown type of plants growing in the garden which were not there last week, and which nobody had planted. Explain how the plants could have appeared.	
Answer	Guidance
Seed dispersal by wind or animals	
1 (c) In the given diagram show the path of the pollen grain from falling on the stigma and reaching to the embryo sac.	
Answer	Guidance

	Diagram showing correct pathway.
1 (d) Which part of the plant will form the future plant?	
Answer	Guidance
The seed	Correct answer only.

Science7EVR4

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7EVR41a	2				7.2.13	2
Science7EVR41b		2			7.3.6	2
Science7EVR41c			2		7.2.13	2
Total marks	2	2	2			6

Item purpose

The questions assess student's knowledge, understanding & application of concept of 'reproduction in plants'.

Source(s)

5 10	There are several ways by which plants produce their offspring. These are categorized into two types: (i) asexual and (ii) sexual reproduction. In asexual reproduction plants can give rise to new plants without seeds, whereas in sexual reproduction, new plants are obtained from seeds. You know that the flowers are the reproductive parts of a plant. The stamens are the male reproductive part, and the pistil is the female reproductive part. Insects visit flowers and carry away pollen on their bodies. Some of the pollen lands on the stigma of a flower of the same kind. The transfer of pollen from the anther to the stigma of a flower is called pollination. If the pollen lands on the stigma of the same flower it is called self-pollination. When the pollen of a flower lands on the stigma of another flower of the same plant, or that of a different plant of the same kind, it is called cross-pollination. Seeds and fruits of plants are carried away by wind, water and animals. Plants benefit from seed dispersal.

Source information: Class VII NCERT Science Textbook.

Question(s)

1

1 (a) A teacher visited a vegetable farm with students. The table shows the plants growing in that f

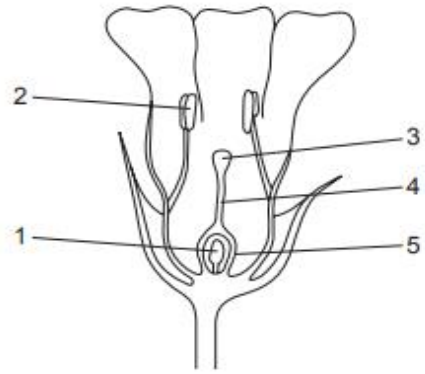
- Pumpkin plant
- Cucumber plant
- Potato plant
- Tomato plant

The teacher pointed out a plant and said that its mode of reproduction is different from the other three plants. Which plant might have been pointed out by the teacher and why?

(2 marks)

1 (b) State the numbers of the parts of the flower which continue to develop after fertilisation?

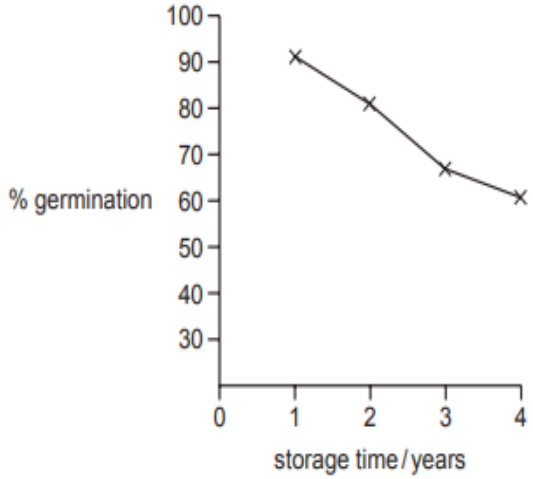
The diagram shows a flower in vertical section.



(2 marks)

1 (c) What can be concluded from the above graph regarding storage time & % of germination of seeds?

The graph shows the effect of storage time on the germination of some seeds.



(2 marks)

(Total 6)

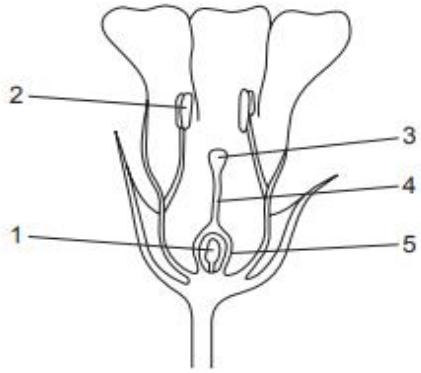
Mark scheme

1 (a) A teacher visited a vegetable farm with students. The table shows the plants growing in that farm. • Pumpkin plant • Cucumber plant • Potato plant • Tomato plant The teacher pointed out a plant and said that its mode of reproduction is different from the three plants. Which plant might have been pointed by the teacher and why?	
Answer	Guidance
• Potato plant (1M) • It reproduces asexually, and other three plants reproduce sexually (1M)	Potato plant as it reproduces asexually. (2M) Partial Credit:

	• Potato plant (1M)

1 (b)

The diagram shows a flower in vertical section.

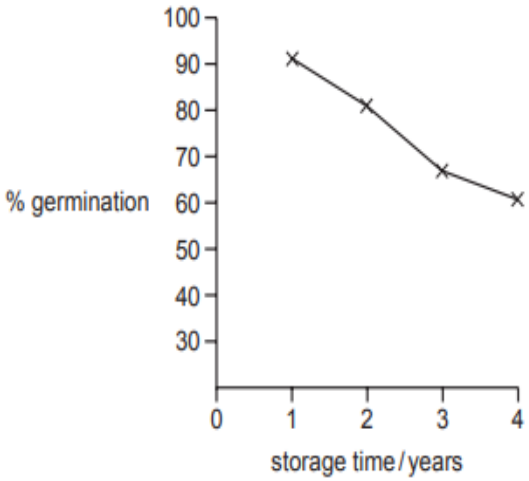


State the numbers of the parts of the flower which continue to develop after fertilisation?

Answer	Guidance
Numbers: 1 & 5 (1+1 M)	2 marks may be awarded if the student writes (the names of the parts instead of giving numbers) Ovary & Ovules 1M may be awarded if only one is written.

1 (c)

The graph shows the effect of storage time on the germination of some seeds.



What can be concluded from the above graph regarding storage time & % of germination of seeds?	
Answer	Guidance
Younger seeds germinate better than older seeds (2M)	2M may also be awarded: Lesser the storage time more will be % of germination. No Partial credit.

Science7MB3

Item identity	AO1 marks	AO2 marks	AO3 marks	AO4 marks	Content Reference(s)	Marks
Science7MB31a	2				7.3.5	2
Science7MB31b	1				7.3.5	1
Science7MB31c				3	7.4.1	3
Total marks	3			3		6

Item purpose

The question assesses the ability of students to analyse the relationship between exercise, breathing rate, heart rate and pulse rate and interpret results.

Source(s)

SL. No.	Breathing Rate	Pulse Rate	Activity level (High, Moderate, Low)
1	16	81	
2	22	95	
3	12	62	

Question(s)

1

1 (a) What is pulse rate **and** how can we measure it?

(2 marks)

1 (b) What is a typical heart rate of a person at rest?

(1 mark)

1 (c) Interpret the data given in the table about changes in breathing rate and pulse rate to complete the table by filling in the activity level.

(3 marks)

(Total marks 7)

Mark scheme

1 (a) What is pulse rate **and** how can we measure it?	
Answer	Guidance
(2 Marks) (i) Pulse rate is number of heart beats per minute. (ii)We can measure pulse by counting the throbbing near our wrist or on the sides of our neck.	Accept below answers or relevant answer with (i) • The number of times blood flows from the capillaries that are caused due to contraction in a minute. (ii) • We can measure pulse by counting the throbbing sound near our wrist. • We can measure pulse by counting the throbbing sound on the sides of our neck. • By using a pulse meter or stethoscope

<table>
<tr><td></td><td></td></tr>
<tr><td colspan="2">1 (b) What is a typical heart rate of a person at rest?</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>(2 marks)

(i) The heart rate of a normal person is approximately 72 beats/ minute.</td><td>(ii) Accept any number between 60 to 100 beats per minute.</td></tr>
<tr><td colspan="2">1 (c) Interpret the data given in the table about changes in breathing rate and pulse rate to complete the table by filling in the activity level.</td></tr>
<tr><td>Answer</td><td>Guidance</td></tr>
<tr><td>(3 marks)

<table><tr><th>SL. No.</th><th>Breathing Rate</th><th>Pulse Rate</th><th>Activity level (High, Moderate, Low)</th></tr><tr><td>1</td><td>16</td><td>81</td><td>Moderate</td></tr><tr><td>2</td><td>22</td><td>95</td><td>High</td></tr><tr><td>3</td><td>12</td><td>62</td><td>Low</td></tr></table></td><td>Assign 3 marks for 3 correct answers, 2 marks for 2 two correct answers and 1 mark for 1 correct answer.

Accept equivalent wording.</td></tr>
</table>