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PROVINCE OF KWAZULU-NATAL

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DEPARTMENT OF EDUCATION

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SENIOR PHASE

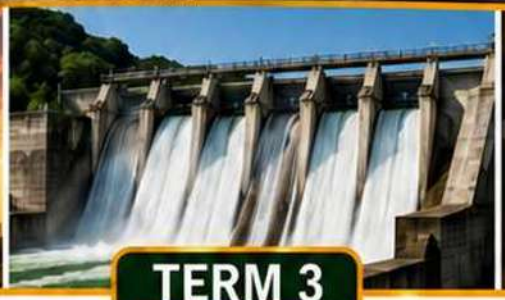
TOPIC TESTS

GRADE 8











TERM 3

ENERGY AND CHANGE

KZN DISTRICTS:
iLembe, King Cetshwayo, Uthukela, Umgungundlovu, Umzinyathi, Umkhanyakude, Zululand, Harry Gwala, Ugu, Amajuba, Pinetown, Umgungundlovu, Umlazi

INSPIRING POTENTIAL

BUILDING KNOWLEDGE

SHAPING OUR FUTURE

2026

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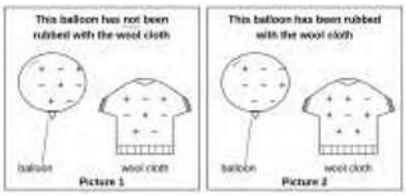
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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 1
Topic: Static Electricity

Marks: 30 **Time:** 40 minutes

Question 1

Study the diagrams below and answer the questions that follow.



Source: Own drawing

1.1 Refer to picture 1 and determine the kind of a charge that the balloon has.

A. positive charge
B. negative charge
C. neutral charge
D. no charge (1)

1.2 How did the balloon change its charge in picture 2?

A. negative charges transferred from the cloth when it was rubbed.
B. positive charges transferred from the cloth when it was rubbed.
C. neutral charge transferred from the cloth when it was rubbed.
D. Neutral charge transferred to neutral cloth (1)

1.3 Lightning happens when …

A. a large build-up of static charge in a cloud is suddenly discharged
B. sound energy from thunder is changed into light energy
C. the sun heats the air inside a cloud until it glows
D. the earth's magnetic field pulls clouds together (1)

1.4 A closed metal car is a safe place during a thunderstorm because the …

A. rubber tyres stop the charge from reaching the passengers
B. metal body carries the charge around the outside of the car to the ground
C. windows are made of glass, which is a conductor
D. car battery absorbs the extra charge (1)

[4]

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Question 2

A picture of learner combing his hair is given below:



source: https://www.alamy.com/shaddy2dsk/

2.1 Define the term static electricity. (2)

2.2 While a learner combs his hair, charges are being separated. (1)

2.3 When objects rubs against each other, charges starts separating.

2.3.1 Which charges move when objects are rubbed against each other? (1)

2.3.2 What is the electric charge of an object that loses electrons? (1)

2.3.3 How does a charged object affect another charged object? (1)

2.4 A learner rubs a plastic ruler with a wool cloth and then holds it close to small pieces of paper. Predict what will happen to the pieces of paper, and explain your prediction using the concept of static electricity. (2)

2.5 Explain how an electrostatic discharge occurs? (3)

[11]

Question 3:

3 A group of Grade 8 learners investigated which material becomes most strongly charged when it is rubbed. Each rod was rubbed 10 times with the same wool cloth and then held 2 cm above a pile of small pieces of paper. The number of pieces of paper picked up was counted. Each test was repeated three times. Their results are shown in the table below.

Material	Trial 1	Trial 2	Trial 3	Average
Plastic rod	12	14	13	13
Glass rod	8	9	7	8
Perspex rod	10	11	12	11
Copper rod	0	1	2	?

3.1 Write down an investigative question for this investigation. (2)

3.2 Identify the:

3.2.1 Independent variable. (1)

3.2.2 Dependent variable. (1)

3.3 State TWO variables that were kept constant during the investigation. (2)

3.4 Calculate the average number of pieces of paper picked up by the copper rod. (2)

3.5 Explain why the copper rod picked up almost no paper. (3)

3.6 Give a reason why the learners repeated each test three times. (1)

3.7 Draw a conclusion for this investigation. (3)

[15]

Total Marks: 30

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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 1 MARKING GUIDELINES
Topic: Static Electricity

Marks: 30 **Time:** 40 minutes

Question 1

1.1 C ✓ (1)
1.2 A ✓ (1)
1.3 A ✓ (1)
1.4 B ✓ (1)
[4]

Question 2

2.1 It is an electrical charge that is caused by the build-up of electric charges✓ on the surface of an insulator / object.✓ (2)
2.2 Electrons move from one object to another through friction. ✓ (1)
2.3
2.3.1 The negative charges ✓ (1)
2.3.2 The object will become positively charged ✓ (1)
2.3.3 It can attract or repel another charged object. ✓ (1)
2.4 The pieces of paper will be attracted to / will stick to the plastic ruler.✓ Rubbing transfers electrons to the ruler, giving it a static charge, which then attracts the neutral pieces of paper.✓ (2)
2.5 An electrostatic discharge (ESD) happens when a sudden flow of electricity moves between two objects with different electrical charges.✓ This occurs because an imbalance of electrons builds up on a surface,✓ and when it touches or comes close to a conductive path, the stored energy releases instantly to balance out.✓ (3)
[11]

Question 3

3.1 Which material becomes most strongly charged when it is rubbed with a wool cloth?✓✓ (2)
3.2
3.2.1 The type of material (of the rod).✓ (1)
3.2.2 The number of pieces of paper picked up.✓ (1)
3.3 Any TWO: number of rubs (10)✓; the same wool cloth✓; the distance above the paper (2 cm); the size of the pieces of paper. (2)
3.4 (0 + 1 + 2) ÷ 3 ✓ = 1 ✓ (2)

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3.5 Copper is a metal / a conductor,✓ so the charge does not stay on its surface✓ — it is conducted away through the learner's hand to earth.✓ (3)

3.6 To make the results more reliable / to reduce the effect of errors.✓ (1)

3.7 The plastic rod becomes the most strongly charged✓ and copper (a metal) does not hold a static charge✓ when rubbed with a wool cloth.✓ (3)

[15]

Total Marks: 30

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KWAZULU-NATAL PROVINCE
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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 2
Topic: Energy Transfer in Electrical Systems

Marks: 30 **Time:** 40 minutes

Question 1

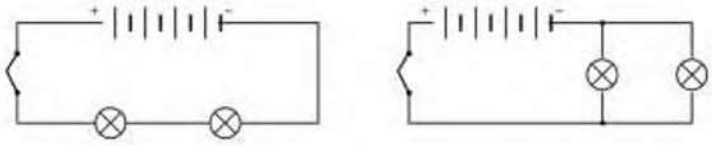
1 Copy the table below and include the symbols of each components and their functions.

	Component	Symbol	Function
1.1	cell		
1.2	battery		
1.3	wire		
1.4	open switch		
1.5	light bulb		

[10]

Question 2

2.1 A group of grade 8 learners set up the following two electric circuits with identical light bulbs and the same voltage.



Circuit 1 **Circuit 2**

2.1.1 Define electric current. (2)

2.1.2 What type of circuits is illustrated in circuit 1 and circuit 2? (2)

2.1.3 How does the brightness of the bulbs in both circuits differ? (2)

2.1.4 Explain this difference in the brightness of the bulbs in the two circuits. (2)

2.2 What is the difference between an input and an output device? (2)

2.3 Study the three appliances shown below. Categorise each appliance according to its main energy conversion, and then justify your classification for the doorbell. (2)



Source: Own drawing

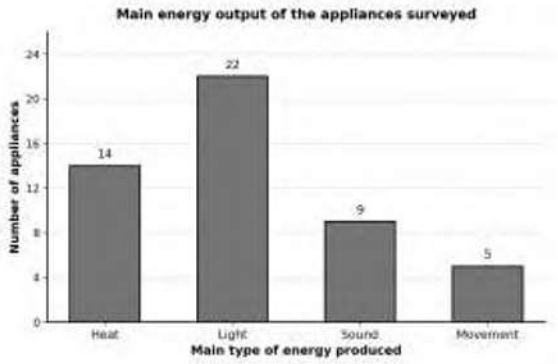
[12]

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Question 3

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A group of Grade 8 learners surveyed all the electrical appliances in their homes. They grouped the appliances according to the MAIN type of energy that each appliance produces. Their results are shown in the graph below.



Source: Own graph

3.1 Name the energy conversion that takes place in a kettle. (1)

3.2 Use the graph to calculate how many MORE appliances produce light than produce movement. (2)

3.3 Name ONE appliance that belongs in the "movement" group, and write down the energy conversion that takes place in it. (2)

3.4 The learners found more appliances in the "light" group than in any other group. Suggest ONE reason for this. (1)

3.5 A learner said that a television belongs in only ONE of these groups. Do you agree? Give a reason for your answer. (2)

[8]

Total Marks: 30

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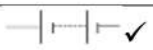
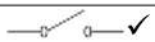
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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 2 MARKING GUIDELINES
Topic: Energy Transfer in Electrical Systems

Marks: 30 **Time:** 40 minutes

Question 1

1

	Component	Symbol	Function
1.1	cell	 ✓	It stores energy✓
1.2	battery	 ✓	It is made up of TWO or more cells joined together, so it supplies a greater voltage than a single cell✓
1.3	wire	✓	is to carry electric current safely and efficiently from a power source to a device✓
1.4	open switch	 ✓	creates a physical break in an electrical circuit, forcing current flow to drop to zero✓
1.5	light bulb	 ✓	is to convert electrical energy into visible light✓

[10]

Question 2

2.1

2.1.1 The flow/movement✓ of charge/s in an electric circuit. ✓ (2)

2.1.2 Circuit 1 is **a series circuit** as there is only ONE path for the charges /current to flow.) ✓
Circuit 2 is a **parallel circuit** as there are MORE than one path for charges / current to flow. ✓ (2)

2.1.3 circuit 1 – bulbs will glow dimmer ✓ than bulbs in circuit 2 ✓ (2)
Or
circuit 2 – bulbs will glow brighter✓ than bulbs in circuit 1. ✓

2.1.4 In a **series circuit** with two bulbs, components share a single path, meaning if one bulb blows, the whole circuit breaks and the remaining bulb goes out. ✓ In a **parallel circuit**, each bulb has its own separate branch, so if one bulb blows, the other branch keeps working and stays lit.✓ (2)

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2.2 Input device sends information or a signal into the electrical system✓ and output device receives information or electrical energy from the system and produces an action or effect. ✓ (2)

2.3 Kettle – electrical energy to heat energy; fan – electrical energy to kinetic (mechanical) energy; doorbell – electrical energy to sound energy.✓ The doorbell is classified as a sound conversion because its main purpose is to produce a sound when the circuit is completed.✓ (2)

[12]

Question 3

3.1 Electrical energy to heat (thermal) energy.✓ (1)

3.2 22 − 5 ✓ = 17 appliances ✓ (2)

3.3 Any suitable appliance, e.g. a fan / food mixer / washing machine / electric drill✓; electrical energy to kinetic (movement) energy✓ (2)

3.4 Any ONE suitable reason, e.g. almost every room in a house has a light, so lights are the most common electrical appliance in a home.✓ (1)

3.5 No / I do not agree.✓ A television produces BOTH light and sound, so it belongs in more than one group.✓ (2)

[8]

Total Marks: 30

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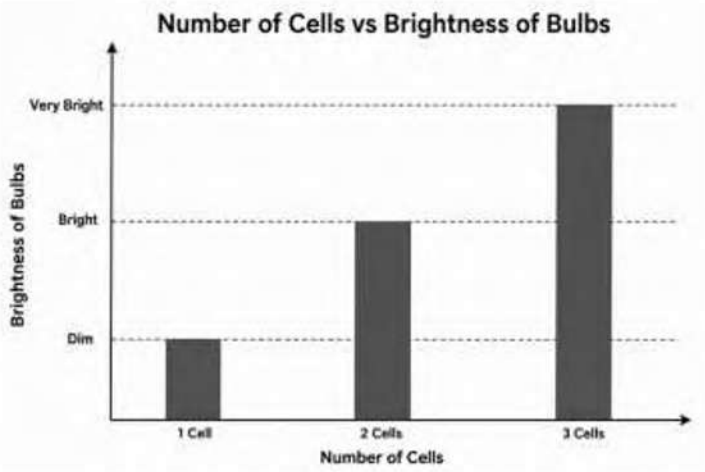
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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 3
Topic: Series and Parallel Circuits

Marks: 30 **Time:** 40 minutes

Question 1

Esihle, a grade 8 learner connected three identical bulbs in a parallel circuit. She changed the number of identical cells while keeping all other variables the same. The brightness of the bulbs was observed. She recorded her results in the graph.



1.1 Write down the aim of this investigation. (2)

1.2 Identify the:

1.2.1 Independent variable. (1)

1.2.2 Dependent variable. (1)

1.3 State TWO variables that must be kept constant during the investigation. (2)

1.4 Describe the relationship between the number of cells and the brightness of the bulbs. (2)

1.5 Explain why all three bulbs have the same brightness in a parallel circuit. (2)

1.6 Predict what will happen to the brightness of the bulbs if a fourth cell is added (1)

1.7 Give a reason for your answer in 1.6. (1)

1.8 Give TWO advantages of a parallel circuit compared with a series circuit. (2)

1.9 Draw a conclusion for this investigation. (2)

1.10 Explain why houses are wired using parallel circuits. (2)

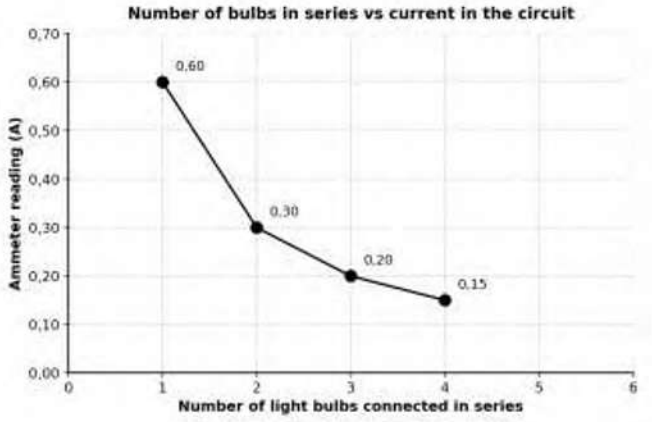
[18]

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Question 2

Learners connected identical light bulbs in SERIES to the same battery. They used an ammeter to measure the current in the circuit each time another bulb was added. Their results are shown in the graph below.



Source: Own graph

2.1 Name the instrument used to measure electric current. (1)

2.2 State the unit in which electric current is measured. (1)

2.3 Write down an investigative question for this investigation. (2)

2.4 Identify the independent variable. (1)

2.5 Describe the relationship between the number of bulbs and the ammeter reading. (2)

2.6 Predict the ammeter reading if FIVE bulbs are connected in series, and give a reason for your answer. (2)

2.7 Draw a circuit diagram of TWO cells, a closed switch and THREE light bulbs connected in series. (3)

[12]

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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 3 MARKING GUIDELINES
Topic: Series and Parallel Circuits

Marks: 30 **Time:** 40 minutes

Question 1

1.1	To investigate how increasing the number of cells affects the brightness✓ of three bulbs connected in a parallel circuit✓	(2)
1.2	1.2.1 Number of cells✓	(1)
	1.2.2 Brightness of the bulbs✓	(1)
1.3	Any two: identical bulbs✓; same connecting wires✓; same circuit arrangement✓; identical cells✓	(2)
1.4	As the number of cells increases,✓ the brightness of all three bulbs increases. ✓	(2)
1.5	In a parallel circuit each bulb receives the full voltage from the cells✓, so identical bulbs have the same brightness. ✓	(2)
1.6	The bulbs will become very bright✓	(1)
1.7	Because adding another cell increases the voltage supplied to the circuit. ✓	(1)
1.8	Any two: if one bulb fails✓, the others stay on✓; each bulb receives full voltage✓; bulbs can operate independently✓; brightness remains the same when another branch is added. ✓	(2)
1.9	Increasing the number of cells increases✓ the brightness of the bulbs in a parallel circuit. ✓	(2)
1.10	Appliances work independently✓, and if one appliance is switched off or fails, the others continue to work. ✓	(2)

[18]

Question 2

2.1	Ammeter✓	(1)
2.2	Ampere / A✓	(1)
2.3	How does the number of light bulbs connected in series affect the current in the circuit?✓✓	(2)
2.4	The number of light bulbs (connected in series).✓	(1)
2.5	As the number of bulbs connected in series increases✓, the ammeter reading (current) decreases.✓	(2)
2.6	Less than 0,15 A (e.g. about 0,12 A)✓ — adding more bulbs in series increases the resistance of the circuit, which decreases the current.✓	(2)
2.7	Two cells in series✓; a closed switch✓; three light bulbs in ONE single loop✓	(3)

[12]

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KWAZULU-NATAL PROVINCE
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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 4
Topic: Visible Light

Marks: 30 **Time:** 40 minutes

Question 1:

1.1 Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A - D) next to the question number (1.1.1 - 1.1.3) in the ANSWER SHEET, e.g. 1.1.6 A

1.1.1 When light hits the surface three things happen. List all three

A. radiation, dispersion and absorption
B. transformation, reflection and radiation
C. absorption, transmission and reflection
D. dispersion, radiation and transformation (1)

1.1.2 Select the true statement about light

A. It moves around the corners
B. It moves in straight line
C. It is reflected through a prism
D. It is the electromagnetic spectrum (1)

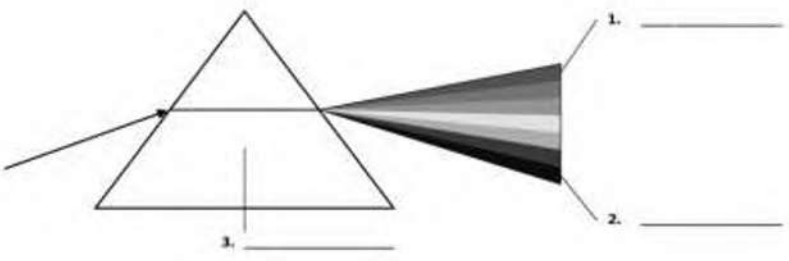
1.1.3 What will be the angle of incidence if a ray is reflected back at an angle of 30 °

A. 60 °
B. 75 °
C. 30 °
D. 15 ° (1)

[3]

Question 2

Light travels through a prism as shown in the diagram below: Answer the following questions



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2.1 Label the parts of the diagram above. Write down the name of the colour or the material next to each number (1 to 3). (3)

2.2 What is the phenomenon called when white light breaks up into the seven colours? (1)

2.3 Explain why most objects appear to be black on a dark night, especially when the moon is not visible (1)

2.4 What is the name given for the collection of the seven colours of white light? (1)

2.5 Name the natural event in which sunlight is split into the colours of the spectrum by water droplets in the air. (1)

2.6 A learner says that a glass prism adds colour to white light. Do you agree? Give a reason for your answer. (2)

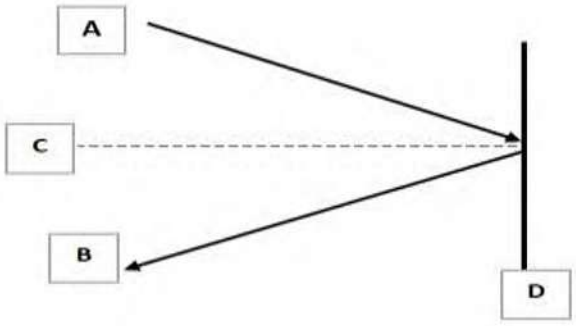
2.7 Redraw the following diagram on your answer paper to show the path through a rectangular glass block. Show the normal, angle of incidence and angle of refraction as the light ray enters the glass block. (4)



[13]

Question 3

Study the following diagram and answer the following questions. The diagram below shows a ray of light reflected by a reflective surface.



3.1 Name and define the term represented by letter C (2)

3.2 Given the terms, **reflection**, **refraction** and **absorption**, **choose** the term that best explains the following:

3.2.1 A computer screen that is switched off is black. (1)

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3.2.2 A pencil in a glass of clean water looks broken at the place where it enters the water. (1)

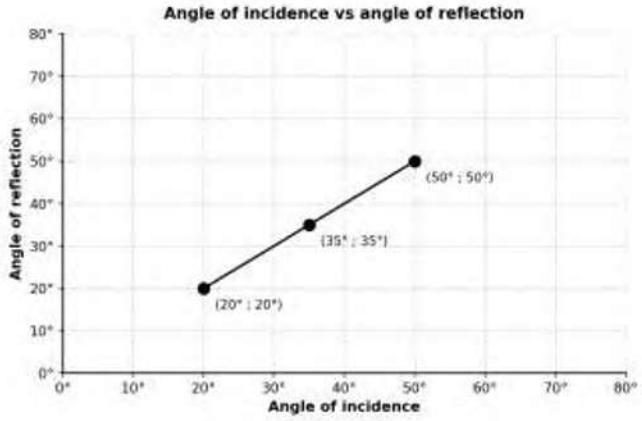
3.3 Classify the following into opaque and transparent objects.

3.3.1 glass

3.3.2 bricks (2)

3.4 Is the Moon luminous or non-luminous? Give a reason for your answer. (2)

Learners used a ray box and a plane mirror to investigate how the angle at which a light ray strikes a mirror affects the angle at which it is reflected. Both angles were measured from the normal. Their results are shown in the graph below.



Source: AI generated

3.5 Write down an investigative question for this investigation. (2)

3.6 Identify the dependent variable. (1)

3.7 Use the graph to predict the angle of reflection when the angle of incidence is 65°. (1)

3.8 Draw a conclusion for this investigation and name the law that it illustrates. (2)

[14]

Total Marks: 30

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NATURAL SCIENCES GRADE 8
TERM 3 TOPIC TEST NO. 4 MARKING GUIDELINES
Topic: Visible Light

Marks: 30 **Time:** 40 minutes

Question 1

1.1

1.1.1 C ✓ (1)

1.1.2 B ✓ (1)

1.1.3 C ✓ (1)

[3]

Question 2

2.1 1. red✓ 2. violet✓ 3. transparent / colourless glass prism✓ (3)

2.2 dispersion ✓ (1)

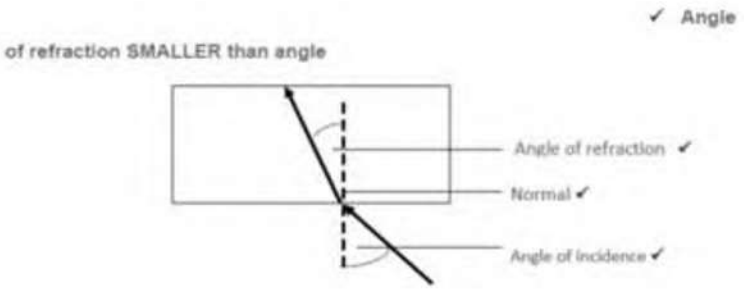
2.3 Most objects appear black on a dark night because there is very little light available for them to reflect✓, and our eyes cannot detect light in the absence of a light source. ✓ (1)

2.4 visible spectrum ✓ (1)

2.5 A rainbow✓ (1)

2.6 No / I do not agree.✓ The seven colours are already present in white light — the prism only separates (refracts) them.✓ (2)

2.7



(4)

[13]

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Question 3

3.1	C – normal ✓ is a line perpendicular to the surface, where the incident and reflected light rays meet ✓✓	(2)
3.2.1	absorption ✓	(1)
3.2.2	refraction ✓	(1)
3.3.1	transparent ✓	(1)
3.3.2	opaque ✓	(1)
3.4	Non-luminous ✓ — the Moon does not produce (give off) its own light; it only reflects light from the Sun. ✓	(2)
3.5	How does the angle of incidence affect the angle of reflection?✓✓	(2)
3.6	The angle of reflection.✓	(1)
3.7	65°✓	(1)
3.8	The angle of incidence is always equal to the angle of reflection✓ - this illustrates the law of reflection.✓	(2)

[14]

Total Marks: 30

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