



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2007

SCIENCE (without Local Studies)

[1989 Syllabus]

HIGHER LEVEL

Marking Scheme

Junior Certificate Examination

SCIENCE

Higher Level Paper

Structure

Five sections A, B, C, D, E*.

Section A:		3 question (attempt all questions) 10 parts in each question (attempt any 8 parts)
Section B:	Physics	2 questions (attempt any 1 question)
Section C:	Chemistry	2 questions (attempt any 1 question)
Section D:	Biology	2 questions (attempt any 1 question)
Section E:	Applied Sc.	6 questions (attempt any 2 questions)

*Section E does not appear on the Science with Local Studies examination paper.

Marking

Without Local Studies:	$(6 \times 48) + (2 \times 36) = 288 + 72 = 360$ marks
With Local Studies:	$(6 \times 48) = 288$ marks

Grades

Grade	Marks	
	<i>Without LS</i>	<i>With LS</i>
A	306 - 360	245 - 288
B	252 - 305	202 - 244
C	198 - 251	158 - 201
D	144 - 197	115 - 157
E	90 - 143	72 - 114
F	36 - 89	28 - 71
NG	0 - 35	0 - 27

CANCELLED REPEATED OR EXCESS ANSWERS

CANCELLED ANSWERS

SECTION A If an answer is cancelled and a second answer given you should accept the cancellation and award marks for the uncanceled answer. If neither is cancelled then give zero except in the case where both answers are correct.

SECTION B, C, D and E If candidates answer a question or part of a question only once and then cancel, you should ignore the cancelling and mark in the usual way. If candidates answer a question or part of a question more than once and then cancel one attempt, you should ignore the cancelling and mark all the answers whether cancelled or not, however count only the marks gained in respect to the highest scoring answer. The disallowed marks should be enclosed in square brackets.

REPEATED ANSWERS

SECTIONS B, C, D AND E If candidates repeat an answer (answer the same question twice) you should mark both answers and allow marks for the highest scoring answer. The disallowed marks should be enclosed in square brackets.

EXCESS ANSWERS

SECTION A Mark all parts but count only the marks for the eight highest scoring parts. Disallowed marks should be enclosed in square brackets.

SECTION B, C AND D Mark all questions but count only the marks awarded to the highest scoring question in each section. Disallowed marks should be enclosed in square brackets.

SECTION E Mark all questions but count only the marks awarded to the two highest scoring questions. Disallowed marks should be enclosed in square brackets. Extra care should be taken with Q.10 (Earth Science), Q.11 (Horticulture) and Q. 13 (Food): count only the marks awarded to the two highest scoring parts (a), (b) or (c). Care should also be taken with options in Q.12 (Materials Science).

DEDUCTION OF MARKS FOR OMITTED DIAGRAM

Assign marks in the usual way. Then use square brackets to deduct the marks.

Science – Higher level 2007


Marking Scheme

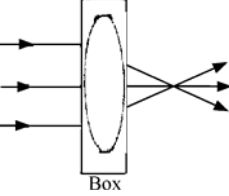
Section A	Q.1		8x6	
	Q.2		8x6	
	Q.3		8x6	
Section B	Q.4	(a)	3x3, 2x3, 5x3	
		(b)	2x3, 1x3, 3x3	
	Q.5	(a)	2x3, 2x3, 3x3	
		(b)	2x3, 1x3, 3x3, 3x3	
Section C	Q.6	(a)	2x3, 1x3, 2x3, 3x3	
		(b)	1x3, 2x3, 4x3, 1x3	
	Q.7	(a)	1x3, 2x3, 1x3, 2x3, 2x3	
		(b)	3x3, 2x3, 1x3, 1x3, 1x3	
Section D	Q.8	(a)	6x3, 2x3	
		(b)	2x3, 1x3, 2x3, 2x3, 1x3	
	Q.9	(a)	2x3, 2x3, 4x3	
		(b)	3x3, 3x3, 2x3	
Section E	ANY TWO QUESTIONS			
	Q.10	(a)	4x3, 2x3	
		(b)	2x3, 2x3, 2x3	
		(c)	2x3, 2x3, 2x3	any two parts
	Q.11	(a)	1x3, 4x3, 1x3	
		(b)	4x3, 2x3	
		(c)	2x3, 1x3, 3x3	any two parts
	Q.12	(a)	3x3, 3x3	
		(b)	2x3, 4x3	any one of four (i) – (iv)
	Q.13	(a)	2x3, 4x3	
(b)		2x3, 1x3, 1x3, 2x3		
(c)		2x3, 4x3	any two parts	
Q.14	(a)	2x3, 1x3, 1x3, 1x3, 1x3		
	(b)	2x3, 2x3, 1x3, 1x3		
Q.15	(a)	4x3, 2x3		
	(b)	2x6, 2x3		

SECTION A (144 MARKS)

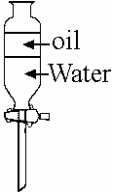
Answer each of the questions 1, 2 and 3.

Question 1. Any eight items, (a), (b), (c), etc. (8 × 6 marks)

- (a) balloon must displace/ balloon is less dense/density of balloon
its own weight of air/than air>equals density of surrounding air (3) [6]
- (b) too long(big)/ water vapour in air space (3)
mercury/ aneroid barometer (3) [6]
- (c) speed has no direction/ velocity has direction/velocity is a vector (6) [6]
- (d) wax/ Vaseline/grease (3)
conduction (3) [6]
- (e) limited range/ measures from 35 to 43 °C/smaller
constriction to stop mercury thread shortening/ needs to be shaken/ holds
person's temperature reading Any two (2x3) [6]
- (f) **advantages, any one from:** no CO₂ released/ no effect on global warming/ (3)
can supply energy for a very long time
disadvantages, any one from: risk of an accident releasing harmful
radiation/ long term storage/ dangerous products (wastes)/ threat of
terrorist attacks (3) [6]
- (g) 430 (3)
- 

(3) [6]
- (h) earth (3)
safety/ protection (3) [6]
- (i)  (3)
- concave/ diverging (3) [6]
- (j) **any one from:** biomass/ geothermal/ hydropower/ solar /tidal/ wind (3)
any one from: radio/ /TV/ micro/.IR/ UV/ X rays/ γ rays/ A.C./sound/heat (3) [6]

Question 2. Any eight items, (a), (b), (c), etc. (8 × 6 marks)

- (a) surface tension (6) [6]
- (b) it loses one electron (3)
Na⁺ (3) [6]
- (c) **A:** toxic/poisonous / should not be taken into our bodies (3)
B: flammable/ inflammable /can catch fire (3) [6]
- (d) zinc sulphate/ ZnSO₄ (3)
hydrogen/ H₂ (3) [6]
- (e) orange/ yellow (3)
litmus paper: red to blue/ alkaline/ basic (3)
pH paper turns blue (violet) / alkaline/ basic (3) [6]
- (f)  two layers (3)
correct order (3) [6]
- (g) K, Ca, Mg, Fe, Cu (6) [6]
allow 3 marks for four in correct order
- (h) soft (3)
chemicals causing hardness stay in **A**/ pure(distilled water) in **B** (3) [6]
- (i) **any two from:** mixture can be separated (compound can not be separated)/ mix is of yellow and black or grey powders (yellow and black or grey particles can not be seen in the compound)/compound is not a powder mix (solid piece)/ compound not attracted to magnet (2 × 3) [6]
- (j) water/ carbon dioxide (CO₂)/ foam/ halon/ sand (3)
matched material or item: paper/ fabrics/wood/ inflammable liquids/ electrical (electronic) equipment (3) [6]

Question 3. Any eight items, (a), (b), (c), etc (8 × 6)

- (a) **A:** gaseous exchange/ takes oxygen (O₂) into the blood/
removes carbon dioxide (CO₂) from the blood/ respiration (3)
B: movement (3) [6]
- (b) amylase/ maltase (3)
starch/ maltose (3) [6]
enzyme and substrate matched for full marks
- (c) wind (3)
colonise new ground/ move away from shade of parents (3) [6]
- (d) **any two from:** growth/ replace dead cells/ repair wounds/
reproduction (gametes) (2 × 3) [6]
- (e) **any two types:** of teeth clearly
named
and labelled (2 × 3) [6]
-
- (f) **A** ligament (3)
B lubricate/ free moving/reduce friction (3) [6]
- (g) food (3)
xylem (3) [6]
- (h) removes urea (wastes)/ forms urine (3)
ureter (3) [6]
- (i) e.g. grass → rabbit → fox (3)
named plant (3)
named herbivore/carnivore in correct level, e.g. rabbit in
level two or fox in level three. (3) [6]
- (j) to collect food/ pollen/ nectar (3)
transfer of pollen/ pollination (3) [6]

SECTION B – PHYSICS (48 marks)

Answer either question 4 or question 5.

Question 4. (48 marks)

- (a) State sum of clockwise moments equals (3)
 sum of anticlockwise moments (3)
 (accept ‘equals’ with either of the above
 statements, however ‘equals’ must appear once
 or 3 marks are lost)
 when a lever is balanced/ in equilibrium (3) **[9]**
- Explain point (3)
 all weight acts/ appears to act (3) **[6]**
- Calculate $(2 \times 40) + (4 \times 10) = 30X$
 or $80 + 40 = 30X$ (3 × 3)
 $120 = 30X$ (3)
 $4 = X$ (3) **[15]**
 calculations must be shown for full marks.
 allow (6) only ‘4’
- (b) Name **A:** overflow (displacement) (eureka) can (3)
) **B:** graduated (measuring) cylinder (3) **[6]**
- How? laboratory balance (3) **[3]**
- Calculate $density = \frac{mass}{volume} / d(\rho) = \frac{m}{v} / \frac{175}{125}$ (3)
- 1.4 (3)
 g/cm³ **or** gcm⁻³ (3) **[9]**
 allow (9) for 1.4 g/cm³ even with no calculation
 shown

Question 5. (48 marks)

(a) How? the needle (magnet) is free to move (3)
it points along magnetic field lines (N-S) (3) [6]

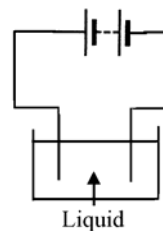
Why? the needle aligns with (3)
the earth's magnetic field lines (3)
or **or**
the needle points (3)
to the earth's north pole (3) [6]

Describe **State or show**
place compass at north pole of magnet (3)
and make a dot in front of needle
move compass so that the dot is behind (3)
the needle
make a second dot in front needle and (3)
continue in this way **or**
or
place magnet on paper and sprinkle iron (3)
filings (3)
tap paper (3) [9]
use compass to get direction

(b) What? rate of flow (3)
) of electric charge (3) [6]

Name **any one from:** plastic/ named plastic/
glass/ paper/ wood/ fabric/ named
fabric... (3) [3]

Outline battery (3)
two electrodes in liquid
shown **or** in named liquid (3)
that conducts
chemical change e.g. gas
evolved/ metal deposited (3) [9]
[no diagram deduct 3 marks]



What? $\frac{p}{v} / \frac{\text{power}}{\text{voltage}} / \frac{6900}{230}$ (3)
30 (3)
A/Amperes/Amps (3) [9]
 $\frac{6.9}{230} / 0.03$ gets 3 marks only

SECTION C - CHEMISTRY (48 marks)

Answer either question 6 or question 7.

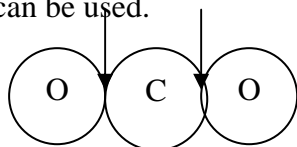
Question 6. (48 marks)

- (a) Write $\text{CaCO}_3 + 2\text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$
any two from: 2HCl / CaCl₂/ H₂O in correct position (2 × 3) [6]
[no equation deduct 3 marks]

Why? carbon dioxide is heavier (denser) than air (3) [3]

Give turns limewater (3)
 milky (3) [6]

Produce Two pairs (four) of electrons shown in each intersection, indicated by the arrows. Dots or Xs can be used. covalent bond shown by a line, here a **pair** of lines is needed for each C to O bond
 $\text{O} = \text{C} = \text{O}$

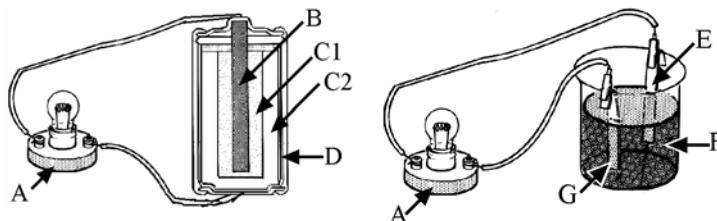


3 marks for each C to O double bond shown (2 × 3)
 3 marks for the correct order i.e. O, C, O (3) [9]
[no diagram deduct 3 marks]

- (b) What? form acids (acid rain) (3) [3]
)

Give **any two from:** kills (damages) plants (trees...)/ animals that live in water (fish, plankton...)/ dissolves limestone /corrodes iron/ releases heavy metals from soil... (2x3) [6]

- (c) Describe



A bulb/ current detector (3)

B carbon/ graphite (first electrode named) (3)

C1/2 carbon & manganese dioxide/ ammonium chloride / electrolyte (3)

D zinc (second electrode named) (3)

or

A bulb/ current detector (3)

E copper/ zinc (3)

F acid/ electrolyte/ named acid or electrolyte (3)

G zinc/ copper (3)

note: E or G can be **any two different metals**

[no diagram deduct 3 marks]

or

[12]

Name

any one from: mobile phone, digital camera, torch...

(3)

[3]

Question 7. (48 marks)

- (a) Name sodium hydroxide/sodium carbonate/ sodium bi(hydrogen) carbonate (or correct formula) (3) [3]
- Name A: burette (3)
B: pipette (3) [6]
- What? indicator/ named acid-base indicator e.g. litmus, methyl orange (3) [3]
- Write **any one from:**
 $\text{NaOH} + \text{HCl} \longrightarrow \text{NaCl} + \text{H}_2\text{O}$
 $\text{Na}_2\text{CO}_3 + 2\text{HCl} \longrightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
 $\text{NaHCO}_3 + \text{HCl} \longrightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$ (3)
reactants correct (3) [6]
products correct
accept word equations
- What? add no indicator/ repeat without indicator (3)
evaporate solution (3) [6]
- (b) Name P: oil (3)
) Why? Q: boiled water (3)
to exclude air/oxygen (3) [9]
- Name and give calcium chloride/ silica (3)
remove water (3) [6]
- What? nails rust in A/ nails do not rust in B and C (3) [3]
- What? air (oxygen) and water are needed for rusting (3) [3]
- What? **any one from:** acid rain/ sea (salty) water/
no protective coating e.g. paint, oil, grease,
zinc (galvanised)/ enamel/ temperature (3) [3]

SECTION D – BIOLOGY (48 marks)

Answer either question 8 or 9.

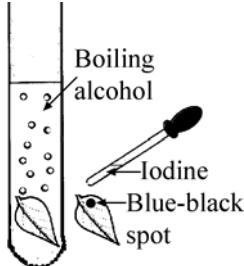
Question 8. (48 marks)


- (a) Give **name of A:** lens (3)
 function of A: focus/ make image sharp/
 accomodation (3)
- name of B:** iris (3)
 function of B: controls amount of light entering
 the eye/ controls brightness of image (3)
- name of C:** retina (3)
 function of C: receives (records) image/ light
 sensitive (3) **[18]**
- Distinguish **sensory nerves:** send message to brain (CNS)
 (spinal cord)/ from sensors (3)
 motor nerves: send message from brain (CNS)
 (spinal cord)/ send message to muscles/
 effectors (3) **[6]**
- (b) (i) Give keep separate oxygenated blood (3)
 from deoxygenated blood (3) **[6]**
 allow 3 marks for mention of ‘oxygenated’
 or ‘deoxygenated’ in the candidate’s answer
- (ii) Name atria(um)/ auricle(s) (3) **[3]**
- (iii) What? to stop the blood/ keep the blood flowing in (3)
 being pumped backwards/ the right direction (3) **[6]**
- (iv) Compare
and Give **any two from either:**
 from the heart: thick walls/ no valves/small
 lumen
 to the heart: thin walls/ have valves/large lumen (2 × 3) **[6]**
- (v) Give **any one from:** don’t smoke/ low fat diet/ exercise
 / eat more fruit (vegetables)/ consume more Ω
 oils/ eat more fish/ eat less salt/ check that your
 blood pressure is at a healthy level/ drink less
 alcohol/ check that your blood cholesterol levels
 are at a healthy level/ be a healthy weight... (3) **[3]**

Question 9. (48 marks)

(a) (i) Why? **large area:** to collect as much light as possible (3)
 thin: so that each cell gets light (3) **[6]**

(ii) Name photosynthesis (3)
 transpiration (accept respiration) (3) **[6]**

(iii) Select  destarch plant (leave in total darkness for some time) (3)
 plant in bright light for 2-3 hours (for some time) (3)
 put leaf in boiling alcohol (3)
 add iodine solution to leaf (3)
 blue-black (3)

or **or**
  bag around shoot of plant (3)
 plant in light and warmth (3)
 drops on inside of bag turn (3)
 blue cobalt chloride (3)
 pink because they are water (3) **[12]**
 accept equivalent experiments

[no diagram deduct 3 marks]

(b) (i) Name **any three from:** air, clay, crumb structure, humus, minerals, water... (3 × 3) **[9]**

(ii) Describe mix soil with water (3)
 add universal indicator/ pH paper (3)
 match colour with scale (chart) (3)
 or **or**
 sprinkle soil onto agar in petri dishes (3)
 incubate/ 37 °C (3)
 look for bacterial/ fungal colonies/ spots (growths) (3)
 or **or**
 weigh dry soil (3)
 burn off humus (3)
 reweigh and determine loss in weight (3) **[9]**
 accept equivalent experiments in each case

(iii) Give **any two from:** stop excessive use of fertilisers/
 stop careless use of slurry/ stop release of untreated
 sewage/ reduce CO₂/ SO₂ emissions/ reduce release
 of radioactive items/ reduce release of silage effluent/
 reduce release of CFCs/ use 'green energy'/ recycle
 / reuse... (2 × 3) **[6]**

SECTION E – APPLIED SCIENCE (72 marks)

Answer two questions from this section.

Question 10 – Earth Science (36 marks). Answer any two of (a), (b), (c).

- (a) Compare
the candidate picks a planet and gets 3 marks for each correct statement for items (i) to (iv) for the selected planet only.

	(i) <u>Size</u>	(ii) <u>Distance</u>	(iii) <u>Surface Temp.</u>	(iv) <u>Surface Gravity</u>
Mercury	smaller	closer	hotter	less
Venus	smaller	closer	hotter	less
Mars	smaller	further	colder	less
Jupiter	bigger	further	colder	greater
Saturn	bigger	further	colder	greater
Uranus	bigger	further	colder	greater
Neptune	bigger	further	colder	greater
Pluto	smaller	further	colder	less

(4x3)

[12]

Give **any two from:** atmosphere contains oxygen/ carbon dioxide/ liquid water/ suitable temperature/ energy from the sun/ nitrogen/ phosphorous/ calcium/ iron (elements needed for life)

(2 × 3)

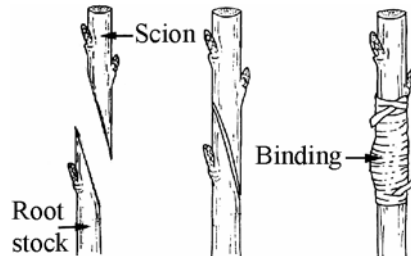
[6]

- (b) What? water vapour in air (3)
compared to the maximum amount (saturation) (3) [6]
- How? water evaporates (3)
this absorbs heat/ latent heat (3) [6]
- What? 100% humidity/ air is saturated with water vapour (6) [6]
- (c) (i) What? temperature (3)
volume/ length of air column (3) [6]
- (ii) How? Plot graph (3)
of temperature against volume (3) [6]
- (iii) What? direct relationship/ straight line (3)
between volume and temperature/ axes labelled (3) [6]
(state or show)

Question 11 – Horticulture (36 marks). Answer any two of (a), (b), (c).

- (a) Name **any one from:** pears/ plums/ grape vines/ roses/ broom/
rhododendrons/ azaleas/ cacti/ ash /elm /pine/ beech... (3) [3]

Describe



(state or show)

- root stock (3)
cut scion to match (3)
bind scion and root stock together (3)
cover joint with wax/ seal (3) [12]
accept other valid grafting methods
[no diagram deduct 3 marks]

Name cambium (3) [3]

- (b) (i) Tell **any one from:** cress/ carrot/ mustard/ radish... (3)
germinate seeds/ put seeds in compost (3)
prick out/ thinning (3)
transplant/ water/ spray (3) [12]

(ii) Give **any two from:** controls weeds/ reduce water loss from
soil/ make beds more attractive/ lower maintenance/
some mulches supply nutrients to soil... (2x3) [6]

- (c) (i) Explain growing plants in solutions/ water (3)
with nutrients (3) [6]
allow 3 marks for ‘growing plants without soil only’

Give **any one from:** more plants to sell/ less disease/ low
maintenance/ no weeding/ clean plants in shops/ quick
(effective) response to problems... (3) [3]

(ii) Give **any three from:** cut them early in the morning/ remove
lower leaves/ cut stems, after harvesting , under water/
keep them in water (solution)/ add plant nutrients to the
water e. g. sugar / add (protective) chemicals to the
water e.g. bleach... (3 × 3) [9]

Question 12 – Materials Science (36 marks). Answer both parts, (a) and (b).

(a) Select (i) Name any three from: (3 × 3)

plastics: dash/ petrol tank cover/ indicator lenses...

metals: engine/ body/ chassis/ wheels/ wiring...

textiles: seat covers/ floor covers...

timber: dash/ steering wheel/ top of gear stick...

(ii) Give any three from: (3 × 3)

plastics: easy to form/ low maintenance/ colours...

metals: easy to form/ strong/ good electrical conductors...

textiles: attractive/ absorbent/ comfortable/ friction...

timber: attractive/ hardwearing...

[18]

(b) Answer any one of the following (i), (ii), (iii), (iv).

(i) Plastics

Explain production of small molecules (monomers) from oil (3)

production of large molecules (polymers) from the small molecules (3) **[6]**

Describe **show or state**

two identical metal cans with one wrapped with plastic (3)

fill each can with hot water and record the temperature (3)

leave the cans for 10 minutes, read the temperatures (3)

smaller drop in temperature for can wrapped with plastic (3) **[12]**

accept equivalent experiments

(ii) Metals

What? **any two from:** copper/ gold/ lead/mercury / silver (2 × 3) **[6]**

Describe **show or state**

try to scratch metal A (3)

with metal B (3)

repeat for B on A (3)

harder metal scratches more/ makes a deeper cut (3) **[12]**

accept equivalent experiments

(iii) **Textiles**

<u>Name</u>	To soak up a liquid	(3)	
<u>Say</u>	any one from: cotton/ viscose (J-Cloths)...	(3)	[6]
<u>Describe</u>	show or state		
	find weight of two samples of textile	(3)	
	soak samples in water	(3)	
	reweigh and find increase in weight	(3)	
	the greater increase in weight is the more absorbent	(3)	[12]
	accept equivalent experiments		

(iv) **Timber**

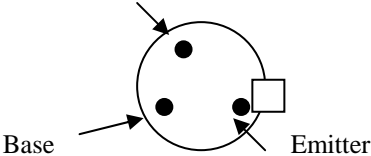
<u>Name</u>	any two from: creosote/ preservatives/ paint / varnish...	(2 × 3)	[6]
<u>Describe</u>	show or state		
	clamp (support) first lath at one (both) ends	(3)	
	add weights to opposite end (middle)	(3)	
	repeat for second lath	(3)	
	the lath that bends least is strongest	(3)	[12]
	accept equivalent experiments		

Question 13 – Food (36 marks). Answer any two of (a), (b), (c).

- (a) Select **any two from:**
protein: growth/ repair/ energy
carbohydrate: energy
fat: energy/ insulation/ structural
calcium: bones/ teeth (2×3) [6]
- Outline acidify the milk/ add bacteria to make lactic acid/
add lemon juice... (3)
add rennet to form curds (3)
strain to collect curds/ remove whey (3)
press to expel moisture/ add salt/ mature (leave for
some time) (3) [12]
- (b) (i) Give **any one from advantages:** protects against food
poisoning/ slows oxidation/ adds flavour/ adds
colour/ longer ‘shelf life’/ cheaper food... (3)
any one from disadvantages: allergies/
hyperactivity/ some can damage health/ damage
vitamins... (3) [6]
- (ii) What? tested by the EU (3) [3]
- What? colours (3) [3]
- Give **any one from cause:** war/ low (no) rain/ diseases
of domestic animals (plants)/ poor transport/
crop failure... (3)
any one from effect: malnutrition/ death/
migration/ breakdown of society/ human
diseases... (3) [6]
- (c) Give **any two from:** fresh food can ‘go-off’ quickly/
preservation extends the ‘shelf life’ of foods/
makes food that are ‘out of season’ available/
foods that can’t be produced locally can be made
available/ protect against food poisoning... (2 × 3) [6]
- Describe heat to 72°C (3)
for short time (15-20 seconds)/ to kill bacteria (3)
cool quickly (3)
to 10°C or lower (in fridge) (3) [12]

Question 14 – Electronics (36 marks). Answer both parts (a) and (b).

- (a) Name **any one from:** potentiometer/potential divider (3)
- State voltage (3) [6]
- What? **any one from:** make bulb brighter/ dimmer (3) [3]
- Give **any one from:** control the volume of a radio (TV) (3) [3]
- (CD player).../ control the brightness of a TV (LCD) (3) [3]
- screen.../ ‘dimmer switch’
- Are? **any one from:** battery and A are in series/ bulb and A are (3) [3]
- in parallel
- Would? no (3) [3]

- (b) Draw Collector **any two correctly** (2 × 3) [6]
-  **named and labelled**
- Base **no diagram less**
- Emitter **3 marks**

- Name **any one from:** thermistor/ temperature dependent (3)
- resistor (TDR)
- State resistance changes with temperature (3) [6]
- Name **any one from:** speaker/ buzzer (3) [3]
- What? **any one from:** turns on/ makes sound (noise) (3) [3]

Question 15 – Energy Conversions (36 marks). Answer both parts (a) and (b).

- (a) Identify
- (i) **A or E** (3)
 - (ii) **B or D** (3)
 - (iii) **C** (3)
 - (iv) **D** (3) [12]

Name **any two from:** chemical/ nuclear/ electrical in a capacitor (condenser)/ energy due to the condition of an object e.g. tensioned (compressed) spring, ‘jack-in-the-box’ (2 × 3) [6]

- (b) Give
- (i) electrical energy to magnetic energy (6)
 - (ii) kinetic energy to sound (6) [12]

Why?

circuit is broken when armature (hammer) moves (attracted to gong) (3)

circuit is remade when armature (hammer) springs back and then the cycle repeats itself (3) [6]