

Environmental and Land-based Science

General Certificate of Secondary Education **GCSE J650**

Mark Schemes for the Units

June 2009

J650/MS/R/09

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

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B491/01 Plant Cultivation, Foundation Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|--|-------|--------------------------------|
| online nos in red | | | | | |
| 1 | | 1 | farmyard manure | 1 | |
| 2 | | 2 | label line with a P touching a petal | 1 | |
| 3 | | 3 | A | 1 | ALLOW nitrates |
| 4 | | 4 | B | 1 | ALLOW remove air from the soil |
| 5 | | 5 | B | 1 | ALLOW hoe |
| 6 | | 6 | D | 1 | ALLOW testa |
| 7 | | 7 | ammonium nitrate potash | 2 | |
| 8 | a | 8 | F ₁ dominant | 2 | |
| 9 | | 9 | large quantities of pollen; because lots is wasted; light / small pollen / pollen with wings; so easy to be carried by wind; feathery stigma / stigma hanging outside flower; to catch pollen; anthers hanging outside flower; for wind to blow pollen off | 4 | |
| 10 | | 10 | runner | 1 | ALLOW stolon/stem |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|--|
| online nos in red | | | | | |
| 11 | a | 11 | sulfur | 1 | |
| | b | 12 | iron | 1 | |
| | c | 13 | 6.5 – 8.0 | 1 | |
| 12 | a | 14 | pricking out / thinning | 1 | |
| | b | 15 | To spread the seedlings out / to prevent the seedlings competing / to allow the seedlings to grow bigger / to give the roots / plants more room | 1 | |
| 13 | | 16 | any two from: adds humus / improves crumb / soil structure / adds nutrients / improves fertility/retains moisture | 2 | ALLOW addition of beneficial soil organisms |
| 14 | | 17 | addition of weeds / weed seeds / weed roots / disease organisms / reduce pH | 1 | ALLOW li not well-rotted, it uses up N. REJECT attracts pests |
| 15 | | 18 | as temperature increases grain can be stored for a shorter time / converse | 1 | must refer to time stored |
| 16 | a | 19 | 9.2 months | 1 | candidates must include units to gain the mark |
| | b | 20 | 3 | 1 | |
| 17 | | 21 | damage / hurt back / toe / plant in eye / cannot see where going; get help carrying it / use a trolley / wheelbarrow / wear goggle | 2 | |

| Question online nos in red | | Expected Answers | Marks | Additional Guidance |
|-------------------------------|----|---|-------|--|
| 18 | 22 | smaller / lower yield; explanation lack of light / water / nutrients; yellow leaves; explanation lack of light / nutrients; leggy / thin stems; explanation lack of light stems bending; explanation unidirectional light | 2 | ALLOW effect of disease from tree ALLOW may not grow as well REJECT reference to sun without mention of light |
| 19 | 23 | use temperature probe; to maintain a suitable temperature for plant growth; use light sensor; to switch lights on when dull to increase photosynthesis; use a humidity sensor; to switch on sprinklers so plants do not wilt; for record keeping; for data logging | 3 | only credit two probes, at least one reason is needed. ALLOW reference to how conditions are changed but candidates must understand the idea that lights / heaters / sprinklers are switched on / off in response to a lack of the necessary factor. REJECT timed lights / sprinklers etc ALLOW electronic leaf |
| 20 | 24 | green leaves / no sign of yellow leaves; leaves turgid / not wilting / not flaccid; no sign of disease / insect damage; good growth / signs of new growth; flowering; good root system | 3 | candidates must refer specifically to the leaves and not generally to the plant. REJECT colourful / bright / good colour |

B491/02 Plant Cultivation, Higher Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|----|--|-------|--|
| online nos in red | | | | | |
| 1 | | 1 | D | 1 | ALLOW testa |
| 2 | | 2 | B | 1 | ALLOW soil |
| 3 | | 3 | ammonium nitrate potash | 2 | |
| 4 | | 4 | label line with an S touching a sepal label line with a P touching the stigma | 2 | |
| 5 | | 5 | D | 1 | |
| 6 | | 6 | B | 1 | |
| 7 | | 7 | C | 1 | |
| 8 | | 8 | B | 1 | ALLOW carrot |
| 9 | | 9 | too much nitrogen / N / nitrate; causes soft tissue growth leading to increased risk of disease / weak stems / burning of roots | 2 | ALLOW reverse osmosis ALLOW encourages the growth of weeds so increases the competition |
| 10 | | 10 | any two from: adds humus / improves crumb structure / adds nutrients / improves fertility / retains moisture | 2 | |
| 11 | | 11 | addition of weed seeds / disease organisms | 1 | ALLOW if not well-rotted, it uses up N. |

Mark Scheme

June 2009

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|--|-------|---|
| online nos in red | | | | | |
| 12 | | 12 | yellow leaves / dead leaves at base / damage to leaves/ leaves wilted | 1 | |
| 13 | | 13 | temperature can be controlled at a constant level; humidity is maintained; cheaper if qualified; less pest damage | 1 | ALLOW economic argument |
| 14 | a | 14 | 9.2 months | 1 | candidates need to include units to gain the mark |
| | b | 15 | 3 | 1 | |
| 15 | | 16 | moisture (no mark) reducing moisture content has a greater effect than reducing temperature; reducing moisture from 18-13% has a 25 fold increase in storage time whereas reducing temperature from 25-5°C only has a 10 fold increase OWTTE | 2 | ALLOW economical argument for reducing moisture content ALLOW any figures which explain the effect |
| 16 | | 17 | any two from: less water is wasted; application is easier to control; water does not get onto leaves / cause leaf rot; reduces erosion; water gets to roots / where it is absorbed | 2 | ALLOW reference to decreased risk of fungal infections compared to mist propagation |
| 17 | a | 18 | anthers lower than stigma; insects less likely to transfer pollen to stigma; male and female organs mature at different times; pollen cannot fertilise egg self-incompatibility–pollen tube cannot grow | 2 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|--|-------|---|
| online nos in red | | | | | |
| 17 | b | 19 | Increase genetic variation; prevent inbreeding | 1 | |
| 18 | a | 20 | P and K become available | 1 | all nutrients needed for the mark |
| | b | 21 | N, Ca and Mg become unavailable; | 1 | all nutrients needed for the mark |
| | c | 22 | fewer ions bound to soil particles; more soluble; pH more suitable for microbial activity; examples of decay / N fixation | 2 | |
| 19 | | 23 | submerged in disinfectant to kill microbes; packed in polystyrene to prevent bruising; use of insect free crates/pesticides to prevent spoiling; refrigerated to prevent enzyme activity/ripening; well ventilated to remove ethylene; well ventilated to reduce humidity to prevent rotting; controlled atmosphere/reduce O ₂ / increase CO ₂ to slow respiration; treated with ethylene gas before sale to speed up ripening | 3 | ALLOW ethane / ethylene a mark was awarded for two or more conditions with no explanation |
| 20 | | 24 | use temperature probe; to maintain a suitable temperature for plant growth; use light sensor; to switch lights on when dull to increase photosynthesis; use a humidity sensor; to switch on sprinklers so plants do not wilt; for record keeping; for data logging | 3 | only credit two probes, at least one reason is needed ALLOW reference to how conditions are changed but candidates must understand the idea that lights / heaters / sprinklers are switched on / off in response to a lack of the necessary factor. REJECT timed lights / sprinklers etc ALLOW electronic leaf |

B492/01 Amenity Horticulture, Foundation Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|---|--|-------|--|
| online nos in red | | | | | |
| 1 | | 1 | C water | 1 | |
| 2 | | 2 | C sown and grown outdoors | 1 | |
| 3 | | 3 | B pricking out | 1 | |
| 4 | | 4 | C soil is normally warm and moist in autumn | 1 | |
| 5 | | 5 | B prevents birds and rabbits from eating the seedlings F warms the soil so that seeds grow quicker | 2 | |
| 6 | | 6 | B does not have any pests or diseases C has the correct balance of nutrients | 2 | |
| 7 | | 7 | begonia geranium | 2 | |
| 8 | | 8 | any two from: price signs/ posters/ provide customer with shopping baskets/ special offer (BOGOF) plant information OWTTE | 2 | REJECT: use decorate pots or stones REJECT : move the display to the front of the shop ALLOW: remove dead leaves/ plants |
| 9 | | 9 | advantage: natural, no (or reduced) use of pesticides, safer, disadvantage: slower to work, a different control needed for each problem, control may not be complete, | 2 | REJECT better, cheaper |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|--|
| online nos in red | | | | | |
| 10 | | 10 | any two from: rose / gypsophila / carnation / chrysanthemum / stocks / alstroemeria / lily / iris / sunflower / poppy | 2 | the potential list of acceptable answers is vast marker must use discretion REJECT: daffodil / tulip (and other spring flowering plants) REJECT: pansy and similar small bedding plants ALLOW: antirrhinum |
| 11 | a | 11 | pattern will help stop the turf moving while it roots | 1 | ALLOW: makes it stronger REJECT: roots have more room / concept of competition |
| 11 | b | 12 | any two from: water well / do not walk on the turf / fill in cracks between turf with lawn dressing | 2 | REJECT: apply fertiliser ALLOW: keep animals or vehicles off |
| 12 | | 13 | a plant that lives for more than two years / a plant that lives for many years | 1 | REJECT: more than one year REJECT: any description of hardiness REJECT: references to herbaceous |
| 13 | a | 14 | 6500 | 1 | |
| 13 | b | 15 | any two from: wearing safety boots / do not use in wet weather / do not cut trailing leads / use RCD / do not adjust while running (connected) / not under the influence of drugs or alcohol / not at night / reference to instruction book or sings / training | 2 | REJECT: be careful REJECT: use of contractor OWTTE ALLOW: use petrol / cordless mower REJECT: use strimmer. |
| 13 | c | 16 | 10% | 1 | |
| 13 | d | 17 | 1700 | 1 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|--|-------|--|
| online nos in red | | | | | |
| 14 | a | 18 | Ditton | 1 | |
| 14 | b | 18 | Cambridge | 1 | |
| 14 | c | 18 | Buttermilk | 1 | |
| 15 | a | 19 | <p>advantages: earlier production, quicker production, control of environment (OWTTE), cleaner pots or plants, biological control can be used.</p> <p>disadvantages: growth may be 'soft', increase risk of disease spread, risk of overheating.</p> | 3 | MUST include at least one advantage and one disadvantage |
| 15 | b | 20 | <p>any three from:</p> <p>heating system increases temperature</p> <p>automatic ventilation or fans to cool temperature</p> <p>automatic sprinklers or mist to irrigate / increase humidity</p> <p>blinds / blackout to regulate day length</p> <p>supplementary lighting to increase day length / light levels</p> <p>wind (or rain) sensors to close vents to prevent damage to structure or quality of crop</p> | 3 | type of equipment and 'effect' to be cited for 1 mark |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|----|--|-------|-----------------------------------|
| online nos in red | | | | | |
| 16 | | 21 | any two from: depletion of nutrients / diseases in soil / soil pests / reduction in yield / plants may grow less well | 2 | REJECT: concepts of lack of room. |

B492/02 Amenity Horticulture, Higher Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|---|---|-------|--|
| online nos in red | | | | | |
| 1 | a | 1 | B large volumes of roots are needed | 1 | |
| | b | 2 | B does not produce a woody framework | 1 | |
| | c | 3 | A cheaper to install D keeps plants at lower temperature for hardening off | 2 | |
| 2 | | 4 | C use a RCD (circuit breaker) in the circuit | 1 | |
| 3 | a | 5 | luxury lawn summer : ranging between 1–2cm general purpose lawn summer : ranging between 2 to 3cm general purpose lawn autumn : ranging between 2.5cm and 4 cm but greater than summer | 3 | MUST be greater than summer for 1 mark |
| | b | 6 | B increased colonisation of coarse grasses | 1 | |
| 4 | | 7 | D encourage new growth E help eliminate disease | 2 | |
| 5 | a | 8 | pattern will help stop the turf moving while it roots | 1 | ALLOW makes it stronger REJECT roots have more room/ concept of competition |
| 5 | b | 9 | any two from: water well / do not walk on the turf / fill in cracks between turf with lawn dressing | 2 | REJECT apply fertiliser ALLOW keep pets or vehicles off |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|----|----|--|-------|---------------------------------|
| online nos in red | | | | | |
| 6 | | 10 | advantage: natural, no (or reduced) use of pesticides, safer, disadvantage: slower to work, a different control needed for each problem, control may not be complete | 2 | REJECT better or cheaper |
| 7 | a | 11 | limestone affects the compost pH / pH needs to be the same in each mix. | 1 | |
| 7 | b | 12 | any two from: too many nutrients / too strong will scorch roots reverse osmosis seedling are smaller – do not require as many nutrients (or concept of) | 2 | ALLOW wasting money (qualified) |
| 8 | | 13 | any two from: method may cause spray drift / herbicide may fall onto non-target areas / application rate is inaccurate / easy to over or under-dose the herbicide / large quantities of water will wash the herbicide off the leaves of weeds | 2 | |
| 9. | a | 14 | (fewer/ smaller drops of water on the film cause) less light to be reflected off the polytunnel | 1 | |
| | b | 15 | less condensation, so more even watering / small droplets so less plant damage / even water pattern less likely to spread disease / OWTTE | 1 | |
| | ci | 16 | £100 | 1 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|-----|----|--|-------|---|
| online nos in red | | | | | |
| 9 | cii | 17 | improved light transmission may mean earlier / larger / improved crops | 1 | REJECT reference to cost |
| 10 | a | 18 | £40,000 | 1 | |
| | b | 19 | £134 000 | 1 | |
| | c | 20 | £10 000 | 1 | |
| 11 | a | 21 | advantages: earlier production, quicker production, control of environment (OWTTE), cleaner pots or plants, biological control can be used. disadvantages: growth may be 'soft', increase risk of disease spread, risk of overheating | 3 | at least one advantage and one disadvantage |
| 11 | b | 22 | any three from heating system increases temperature automatic ventilation or fans to cool temperature automatic sprinklers or mist to irrigate / increase humidity blinds / blackout to regulate day length supplementary lighting to increase day length / light levels wind (or rain) sensors to close vents to prevent damage to structure or quality of crop | 3 | type of equipment and 'effect' to be cited for 1 mark |

Mark Scheme

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| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|----|--|-------|--|
| online nos in red | | | | | |
| 12 | | 23 | new colours (blue roses) / improved shelf life / cold resistance (save on fuel costs) / alteration to photoperiodic response / less insecticide input / herbicide resistance / improved petal size / improvements to fragrance | 2 | (2 for 1 mark, 4 ways for 2 marks) ALLOW greater uniformity responses must not be generalistic |

B493/01 Management of the Natural Environment, Foundation Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|---|---|-------|--|
| online nos in red | | | | | |
| 1 | | 1 | A | 1 | |
| 2 | | 2 | A 1 to 14 | 1 | |
| 3 | | 3 | B monoculture; | 1 | |
| 4 | | 4 | nitrate | 1 | |
| 5 | | 5 | intensive has high running costs uses ICT for regular monitoring uses a lot of labour | 3 | 2 correct = 1 mark, 4 correct = 2 marks; 5 correct = 3 marks |
| | | | extensive small numbers in large area a natural production system | | |
| 6 | | 6 | C pollen from GM plants pollinates wild flowers | 1 | |
| 7 | | 7 | B they are grown without using chemical herbicides; | 1 | |
| 8a | a | 8 | D visual; | 1 | |
| | b | 9 | burning produces - toxic fumes / smoke / CO ₂ / air / smell pollution; | 1 | REJECT dangerous |

Mark Scheme

June 2009

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|--|-------|---|
| online nos in red | | | | | |
| 9 | | 10 | weeds compete for - space / water / minerals or nutrients / light / they harbour disease / contaminate harvested crop | 2 | any 2 |
| 10 | | 11 | place where organisms / plant / animal, live / exist / occupy / grow | 1 | |
| 11 | a | 12 | pointed front / streamlined shape; 'bristles' for moving or gripping soil; thin / damp skin; (sense organs) detect light / dark / damp; rapid muscle retraction | 1 | any 1 |
| | b | 13 | burrowing aids aeration; burrowing helps drainage; excretion aids soil fertility; calcium excretion affects soil pH; feeding aids recycling / assists decay / drags in leaves; activities mixes soil up; | 2 | |
| 12 | a | 14 | heavy machinery / regular walking / regular vehicle movement / overstocking by animals; | 1 | REJECT animal feet unqualified |
| | b | 15 | more air for root respiration; drainage prevents water damage; spaces for roots to grow through; | 2 | need explanation for mark REJECT more space / more air |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|--|-------|--|
| online nos in red | | | | | |
| 16 | | 20 | energy sources - coal / oil run out; increase in population; increase in individual needs - electrical goods / TV / computers ; increase in transport / fuel; increased energy dependent technology; | 3 | REJECT uses more unless qualified |
| 17 | a | 21 | much less used / about 4 times less / about a quarter less energy used when a heat pump is installed instead of a boiler. heat pump uses less OWTTE | 1 | REJECT costs less, a ref. needs to be made to heat pump less does not need to be quantified |
| | b | 22 | £1.50 | 1 | |
| | c | 23 | B 50% | 1 | |
| | d | 24 | energy source qualified by description of process; e.g. light energy using solar cells / panels; wind using windmills / wind turbines; water movement by HEP / dam barrage; crops for biofuel or direct burning; tidal using turbines in barrier / flotation pumps | 3 | |

B493/02 Management of the Natural Environment, Higher Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|---|---|-------|---------------------------|
| online nos in red | | | | | |
| 1 | | 1 | A sand dunes - top left | 1 | |
| 2 | | 2 | clay - cold / heavy / consists of small particles / small air spaces; sand - drains quickly, well aerated; | 3 | any 2 for 1 mark to max 3 |
| 3 | | 3 | C pollen from GM plants pollinates wild flowers; | 1 | |
| 4 | | 4 | B fixation; | 1 | |
| 5 | | 5 | B they are grown without using chemical herbicides; | 1 | |
| 6 | | 6 | respiration ,evaporation or excretion; | 2 | any 2 for 1 mark to max 3 |
| 7 | | 7 | B both phosphate and potassium ions less available; | 1 | |
| 8 | | 8 | B | 1 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|--|
| online nos in red | | | | | |
| 9 | | 9 | burrowing aids aeration; burrowing helps drainage; excretion aids soil fertility; calcium excretion affects soil pH; feeding aids recycling / assists decay / drags in leaves; activities mixes soil up; | 2 | REJECT comments that do not relate to soil environment |
| 10 | | 10 | use smooth / less tread tyres; use broad tyres; use soft / less pressure in tyres; size of tractor used related to conditions; | 2 | ALLOW make fewer passes if qualified ie by using wide sprayers ALLOW keep to same pathway |
| 11 | a | 11 | all crops grow better in heavy soil except sugar beet; no significant difference in heavy or light soil for peas; wheat has the largest difference, 40% better in heavy soil; | 2 | |
| | b | 12 | legumes need more oxygen / air to support nodule bacteria which provide nitrate for growth; | 1 | ALLOW other valid suggestion eg pea roots deeper rooting and well spread |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|---------------------|
| online nos in red | | | | | |
| 12 | a | 13 | do not spray in windy conditions; use the stated concentrations; do not wash out sprayers in a stream / in a way that allows for run off; do not spray near water courses; do not spray near hedge margins; | 2 | |
| | b | 14 | wear protective clothing eg mask, gloves, waterproofs; max 2 read the instructions; do not eat or drink while working; wash hands thoroughly after use; have training / qualifications; | 3 | |
| 13 | | 15 | flooding due to run off from concrete / tarmac roads and paths; lack of water as rapid run off prevents percolation to under ground aquifers; greater abstraction from urbanisation | 2 | |
| 14 | a | 16 | 50% | 1 | |
| | b | 17 | boxes with causes of accidents; bars at 60,40 and 20; | 2 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|-------------------|----|---|-------|---|
| online nos in red | | | | |
| 15 | 18 | energy source qualified by description of process; e.g. light energy using solar cells / panels; wind using windmills / wind turbines; water movement by HEP / dam barrage; crops for biofuel or direct burning; tidal using turbines in barrier / flotation pumps; | 3 | |
| 16 | 19 | fish food contains small amount of pesticide, not harmful; pesticide stored / builds up in fish so bird gets high, lethal dose; | 2 | ALLOW 1 mark for idea of build up through food chain / food chain magnification |
| 17 | 20 | for wet lands - threatened habitat / special inter-tidal flora & fauna / example detail / sandy beaches are common / sand supports few organisms. for beach - economic / detail / manage marsh in confined area so limit spread; | 3 | level of response marking |

B494/01 Care of Animals, Foundation Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|---|---|-------|--|
| online nos in red | | | | | |
| 1 | | 1 | hamster | 1 | |
| 2 | | 2 | back | 1 | |
| 3 | | 3 | L-R D C B A | 3 | 4 correct for 3 marks 3 correct for 2 marks 2 correct for 1 mark |
| 4 | | 4 | it helps them digest food | 1 | |
| 5 | | 5 | concentrate | 1 | |
| 6 | | 6 | clear eyes; clear ears; clean anus; shiny coat; no evidence of parasites; | 2 | ACCEPT other correct responses |
| 7 | a | 7 | Tetanus / Salmonella / Rabies / Weils disease / Lyme disease / TB | 1 | ACCEPT other diseases not on the specification |
| | b | 8 | wash hands / isolate sick animals / good husbandry / innoculatiuon / vaccination; | 1 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|--|
| online nos in red | | | | | |
| 8 | | 9 | features of a spaniel long hairy ears long silky coat features of a terrier small pointed ears coarse coat features of a gun dog long ears close to head short smooth coat | 3 | 6 correct = 3 marks 4 correct = 2 marks 2/3 correct = 1 mark |
| 9 | | 10 | put into hay rack / other container; keep off the floor of cage / housing; so it does not get contaminated / dirty / urine / faeces; replace daily; always use clean fresh hay / don't feed too much / clean feeding container; | 3 | |
| 10 | a | 11 | growth / repair / forms hair / claws / nails; | 1 | |
| | b | 12 | energy / insulation | 1 | |
| 11 | | 13 | pets / companionship OWTTE; food; research; competition; conservation | 2 | ACCEPT references to using fur |
| 12 | a | 14 | clockwise from tail: sperm duct, bladder; penis; testis; | 3 | 4 correct for 3 marks 3 correct for 2 marks 2 correct for 1 mark |
| | b | 15 | testis | 1 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|--|
| online nos in red | | | | | |
| 13 | | 16 | two groups of puppies; numbers of each; standardisation eg same breed; one group given each type of food; what will be measured; time scale / frequency of measuring; | 4 | REJECT see which has grown the most without reference to specific parameter eg weight , height |
| 14 | a | 17 | French lop | 1 | |
| | b | 18 | heavier breeds have shorter lifespan / converse; | 1 | |
| 15 | | 19 | can make animal ill / anaemic / lose weight; can be passed on to other pets; | 2 | ACCEPT answers in context of other parasites |
| 16 | | 20 | prevents fungal / other disease; prevents cold/damp; prevents dry food from going mouldy; other acceptable answer; | 2 | |
| 17 | | 21 | records of veterinary treatment; records of matings; records of births / deaths / sales / purchases; records of age / sex / distinguishing marks; | 1 | there may be other acceptable answers |

B494/02 Care of Animals, Higher Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|---|---|-------|--|
| online nos in red | | | | | |
| 1 | | 1 | A concentrate | 1 | |
| 2 | a | 2 | Tetanus / Salmonella / Lyme disease/ TB / Weils disease / Rabies | 1 | ACCEPT other diseases not on specification |
| | b | 3 | wash hands / isolate sick animals / good husbandry/inoculation/cover wounds; | 1 | |
| 3 | | 4 | records of veterinary treatment; records of matings; records of births / deaths / sales / purchases; records of age / sex / distinguishing marks; | 1 | there may be other acceptable answers |
| 4 | | 5 | any two from prevents fungal (or other) disease; prevents cold / damp; prevents dry food from going mouldy; any other acceptable answer; | 2 | |
| 5 | | 6 | heavier breed have shorter lifespan /converse; | 1 | |
| 6 | a | 7 | A (retinol) / D (calciferol); function of vitamin A – night vision; body cell division; function of vitamin D – regulation of calcium levels; bone growth and repair; | 3 | ACCEPT others not on spec reject to keep healthy |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|-------|--|
| online nos in red | | | | | |
| 6 | b | 8 | enzyme combines with substrate / food; like lock and key; at active site; catalyst; splits food / named food into smaller molecules; makes food soluble; So it can be absorbed; | 4 | REJECT to break down food |
| 7 | | 9 | D rabbit; | 1 | |
| 8 | | 10 | select dogs with longest / silkiest fur; breed these together; over several generations; repeatedly crossing young with longest/ silkiest fur; | 3 | 6 correct = 3 marks 4/5 = 2 marks 2/3 = 1 mark |
| 9 | | 11 | two groups puppies; numbers of each; standardisation e.g. same breed; one group fed each type of food; what will be measured; time scale / frequency of measuring; | 4 | |
| 10 | | 12 | C fish; | 1 | |
| 11 | | 13 | there will be a range of acceptable answers, including: Getting bitten / scratched etc – wear gloves; Infection – wash hands / wear mask / overalls; dropping heavy objects – wear steel toe capped boots; | 2 | no mark for naming animal mark awarded for control measure in correct context |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|----|--|-------|---|
| online nos in red | | | | | |
| 12 | | 14 | B cat and rabbit; | 1 | |
| 13 | | 15 | identical levels in first 20 days; non- pregnant only slightly less days 20 – 60; | 2 | REJECT generalised non-specific statements |
| 14 | | 16 | example of specific sensor; and effector; eg temp. probe; used to switch heating on / off; used to open vents / provide ventilation; humidity probe; used to switch sprinklers on / off; light sensor; used to switch lighting on / off ; timer; used to dispense food / other; | 4 | |
| 15 | | 17 | clockwise from oesophagus: churns food; digestion of fats; digestion of cellulose; stores waste; absorbs water; | 4 | 5 correct = 4 marks 4 = 3 3 = 2 2 = 1 1 = 0 |

B495/01 Livestock Husbandry, Foundation Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|---|---|-------|--|
| online nos in red | | | | | |
| 1 | | 1 | D | 1 | |
| 2 | | 2 | penis, testis, scrotum, vas deferens or any correct | 1 | REJECT sperm |
| 3 | | 3 | ovary – where the eggs are formed / hormone production; uterus – where the embryo / baby / piglet develops / role in birth | 2 | REJECT where fertilization takes place / sperm eggs meet |
| 4 | | 4 | D | 1 | |
| 5 | | 5 | A Belgian Blue | 1 | |
| 6 | | 6 | cut and dried grass – hay cut and dried stalks from a cereal crop – straw fresh grass that has been preserved by pickling – silage | 3 | 1 mark for each fodder correctly described ALLOW detailed examples of production methods |
| 7 | | 7 | chromosomes – gene – genotype –phenotype | 4 | in this order |
| 8 | | 8 | any two from: reduces parasite build up / worm burden, fresh grass / insects etc for birds, less bedding needed, prevents the build up of manure | 2 | ALLOW stops ground getting muddy OWTTE, ALLOW named management reasons, eg move in event of floods, hot weather etc REJECT to move away from predators |

| Question | | Expected Answers | Marks | Additional Guidance |
|-------------------|----|--|-------|----------------------------------|
| online nos in red | | | | |
| 9 | 9 | to know when to put the cow to the bull or use AI -1mark so that the cow will produce milk following calving, to produce replacement calves, to produce calves to rear to sell. additional mark | 2 | |
| 10 | 10 | age of cow, when she last calved, which bull was used last time, how many calves she has had, her average milk yield, (ora) | 3 | |
| 11 | 11 | any two from: yield, disease resistance, hardiness or conformation | 2 | ACCEPT weigh more, more babies |
| 12 | 12 | intensive – low labour input, high-energy costs, animals kept indoors, high equipment costs. extensive – opposites. | 4 | |
| 13 | 13 | approach from the front, talk quietly to the animal, any 1 | 1 | REJECT walk slowly. |
| 14 | 14 | you can steer the pig the pig cannot bite you easily OWTTE | 2 | REJECT so the pig cannot see you |
| 15 | 15 | B gaining weight | 1 | |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|----------------------------------|--------|---------------------|
| online nos in red | | | | | |
| 16 | a | 16 | Greyface Dartmoor | 1 | |
| | b | 17 | Dorset Down and Lincoln Longwool | 1 | |
| 17 | | 18 | 70g – 66g | 1 mark | |
| | | | 5 - 1 mark | 1 | |
| 18 | | 19 | 700g | 1 | |
| | | | 21 weeks | 1 | |

B495/02 Livestock Husbandry, Higher Tier

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|--|---|--|-------|---|
| online nos in red | | | | | |
| 1 | | 1 | any two from: reduces parasite build up / worm burden, fresh grass/insects etc for birds, less bedding needed, prevents the build up of manure | 2 | ALLOW stops ground getting muddy owtte, allow named management reasons, eg move in event of floods, hot weather etc |
| 2 | | 2 | hooves get too long causing difficulty walking 1 mark dirt / bacteria gets trapped leading to foot rot 1 mark | 2 | REJECT sharp hooves dangerous |
| 3 | | 3 | C because longer days stimulate egg production | 1 | |
| 4 | | 4 | electricity can be used to provide additional light 1 mark additional light stimulates egg production 1 mark | 2 | ACCEPT warmth encourages egg production ALLOW reference to automated feed drinkers, heaters etc |
| 5 | | 5 | back injury – proper lifting technique, use mechanical aid. zoonosis – wear protective clothing, wash after activity cutting injury – use correct tools in the correct manner injury – from the animal – animal needs to be correctly secured | 3 | 1 hazard correctly identified with suitable control = 1 mark REJECT cutting too close or other poor skill |
| 6 | | 6 | chromosomes – gene – genotype – phenotype | 4 | in this order |

| Question | | | Expected Answers | Marks | Additional Guidance |
|-------------------|---|----|---|--------|--|
| online nos in red | | | | | |
| 7 | | 7 | ovary – where the eggs are formed/ hormone production; uterus - where the embryo/baby/piglet develops/ role in birth | 1 1 | REJECT where fertilization takes place / sperm eggs meet |
| 8 | a | 8 | 8 doses | 1 | |
| | b | 9 | (i) 80 (ii) 3 packs | 2 | eg if 8 given for i) allow 30 for ii) ACCEPT correct answer for incorrect response to A |
| 9 | | 10 | to know when to put the cow to the bull or use AI -1mark so that the cow will produce milk following calving, to produce replacement calves, to produce calves to rear to sell. Additional mark | 3 | |
| 10 | | 11 | bacteria; virus; fungi; parasites; A actual names but not those used in Q 12/ 11 | 2 | ALLOW insects / worms but not as well as parasites 4 for 2 marks, 2 or 3 for 1 mark |
| 11 | | 12 | Tetanus bacteria getting into a cut TB by a animal coughing on you Salmonella eating contaminated food | 3 | |
| 12 | | 13 | B because the sperm would die if kept at room temperature | 1 | |

| Question | | Expected Answers | Marks | Additional Guidance |
|-------------------|----|---|------------|---|
| online nos in red | | | | |
| 13 | 14 | demand for the products from the public; better flavour; more suited to extensive /organic production; more valuable products, fewer additional costs i.e vets bills, selective breeding of desirable characteristics | 2 | ALLOW opening the farm to visitors to see rare breeds any 2 points |
| 14 | 15 | extensive – difficult to keep eye on stock / exposed to bad weather / exposure to disease carrying wild species Intensive, not able to exhibit natural behaviour / stereotyped behaviour / overcrowded / bullying/ disease spreads easier. | 2 | 1 mark for intensive point 1 mark for extensive point |
| 15 | 16 | sensory stimulation - sight, smell, sounds of the boar trigger a hormonal response in the sows 1 mark, these hormones are responsible for the onset of the heat / season - 1 mark. | 2 | ALLOW reference to pheromones, pituitary |
| 16 | 17 | a oestriadiol and luteinizing b progesterone | 1 1 | both needed for mark |

Grade Thresholds

General Certificate of Secondary Education Environmental and Land-Based Science (J650)

June 2009 Examination Series

Component Threshold Marks

| Component | | Max Mark | A* | A | B | C | D | E | F | G |
|-----------|-----|----------|-----|-----|-----|----|----|----|----|----|
| B491/01 | Raw | 36 | | | | 22 | 19 | 16 | 13 | 10 |
| | UMS | 34 | | | | 30 | 25 | 20 | 15 | 10 |
| B491/02 | Raw | 36 | 29 | 24 | 19 | 15 | 11 | 9 | | |
| | UMS | 50 | 45 | 40 | 35 | 30 | 25 | 20 | | |
| B492/01 | Raw | 36 | | | | 22 | 19 | 17 | 15 | 13 |
| | UMS | 34 | | | | 30 | 25 | 20 | 15 | 10 |
| B492/02 | Raw | 36 | 30 | 26 | 22 | 18 | 14 | 12 | | |
| | UMS | 50 | 45 | 40 | 35 | 30 | 25 | 20 | | |
| B493/01 | Raw | 36 | | | | 22 | 18 | 15 | 12 | 9 |
| | UMS | 34 | | | | 30 | 25 | 20 | 15 | 10 |
| B493/02 | Raw | 36 | 30 | 25 | 20 | 16 | 12 | 10 | | |
| | UMS | 50 | 45 | 40 | 35 | 30 | 25 | 20 | | |
| B494/01 | Raw | 36 | | | | 28 | 25 | 22 | 19 | 16 |
| | UMS | 34 | | | | 30 | 25 | 20 | 15 | 10 |
| B494/02 | Raw | 36 | 32 | 27 | 22 | 18 | 14 | 12 | | |
| | UMS | 50 | 45 | 40 | 35 | 30 | 25 | 20 | | |
| B495/01 | Raw | 36 | | | | 26 | 23 | 20 | 17 | 14 |
| | UMS | 34 | | | | 30 | 25 | 20 | 15 | 10 |
| B495/02 | Raw | 36 | 34 | 30 | 26 | 23 | 20 | 18 | | |
| | UMS | 50 | 45 | 40 | 35 | 30 | 25 | 20 | | |
| B496 | Raw | 109 | 100 | 89 | 77 | 65 | 54 | 44 | 34 | 24 |
| | UMS | 150 | 135 | 120 | 105 | 90 | 75 | 60 | 45 | 30 |

Overall

| | A* | A | B | C | D | E | F | G |
|--------------------------------|-----|-----|-----|------|------|------|------|------|
| UMS | 270 | 240 | 210 | 180 | 150 | 120 | 90 | 60 |
| Cumulative Percentage in Grade | 0.0 | 1.5 | 9.7 | 29.4 | 52.2 | 75.3 | 90.9 | 97.6 |

The total entry for the examination was 1525.

Statistics are correct at the time of publication.

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

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