



Mark Scheme (Results)

January 2015

BTEC Level 1/Level 2 First Certificate
Unit 11: Sustainability in Construction
(21635E)

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if a candidate's response is not worthy of credit according to the mark scheme.
- Where some judgment is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt about applying the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed-out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1	<p>1 mark for each correct answer:</p> <p>(C) Light shading</p> <p>(E) Lower wattage lighting</p> <p>Accept no variations.</p>	(2)

Question Number	Answer	Mark
2	<p>1 mark for each correct answer:</p> <ul style="list-style-type: none"> • Destruction of local habitats (1) • Reduction in wildlife (1) • Loss of land to vehicle parking (1) • Use of land for waste disposal (1) • Loss of greenfield land/ landscapes (1) • Loss of recreational areas/parks (1) • Reduction in air quality (1) • Impact on water courses/water features/ground water levels (1) • Soil/ground damage/contamination (1) <p>Accept any other appropriate answers.</p> <p>Do not accept loss of views/aesthetics/pollution as these are not aspects of the environment.</p>	(2)

Question Number	Answer	Mark
3	<p>1 mark for each correct answer:</p> <p>(A) Retail</p> <p>(E) Health</p> <p>Accept no variations.</p>	(2)

Question Number	Answer	Mark
4	<p>1 mark for identifying the following:</p> <ul style="list-style-type: none"> • Considerate Contractors/Constructors Scheme <p>Accept any other appropriate local initiatives.</p>	(1)

Question Number	Answer	Mark
5	<p>1 mark for a linked description of the following, up to 2 marks:</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Timing of deliveries/route planning (1) to reduce congestion/noise/pollution/avoid times when residents are at home (1) • Use of smaller vehicles (1) so that delivery vehicles do not disrupt local traffic (1) • Use of larger vehicles/ buy in larger quantities (1) reduces the number of deliveries required (1) • Use a single supplier/restrict number of suppliers (1) reduces number of deliveries required (1). <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
6	<p>1 mark for each correct answer:</p> <p>(A) Flax</p> <p>(B) Hemp</p> <p>Accept no variations.</p>	(2)

Question Number	Answer	Mark
7	<p>1 mark for each way identified, up to a maximum of 2 marks.</p> <p>Any of the following:</p> <ul style="list-style-type: none"> • Improved visual amenity (1) • Reduction in vandalism and crime (1) • Provide a social hub for an area (1) • Increase feelings of safety in the community (1) • Meet the specific needs of a community (1) • Improve property values (1) • Increase employment opportunities (1) • Reduces the need to develop local greenfield sites (1) • Stimulates the local economy (1) • Decontamination of former industrial sites (1) • Community may be consulted over the proposed development (1). <p>Accept any other appropriate answers.</p> <p>Do not accept responses relating to cheaper/faster.</p>	(2)

Question Number	Answer	Mark
8	<p>A linked response that makes reference to any one of the following points. Up to 2 marks for an explanation.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Limited design layout of the building (1) because near vertical duct runs are essential for the system to work effectively (1) • There may be unwanted/nuisance drafts (1) due to poor controllability of input grills (1) • Heated air/energy is lost through the system (1) because there is no ability to recover heat/because there is additional energy consumption/cost incurred (1) • Can have a tendency to over/under ventilate (1) as the efficacy of the system is dependent on weather conditions (1) • Sound transfer from external sources (1) because ducts vent to outside air (1). <p>Accept any other appropriate answers.</p>	(2)

Question Number	Answer	Mark
9 (a)	<p>1 mark for each characteristic identified. Up to a maximum of 2 marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Convert sunlight/daylight into electricity (1) • Generates an environmentally friendly/renewable/sustainable form of energy (1) • Can be in the form of roof tiles or panels (1) • Aesthetically pleasing/displeasing (1) • Readily available (1) • Come in a variety of sizes (1) • Colour/black/blue (1) • Flat/rectangular/square/glass panel (1) • Orientated/facing south/towards the sun (1) <p>Accept any other appropriate answers.</p> <p>Do not accept big/small or light/heavy as these are relative terms.</p>	(2)

Question Number	Answer	Mark
9 (b)	<p>A linked response that makes reference to any of the following points. Up to 2 marks for one explanation.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • The orientation is critical (1) because the panels need to be south facing/inclined at 30 to 40 degrees to maximise solar gain (1) • Adds additional load to the roof (1) which the roof may not have been designed to support (1) • May be impractical to install on some roofs (1) because of difficulty in achieving a fixing eg. to thatched roofs/size and shape of roofs (1) • The panels are fairly inaccessible (1) and therefore maintenance issues may arise (1) • An unreliable primary source of energy (1) because the ability to generate electricity is weather/daylight dependent (1) • May spoil aesthetics (1) as some consider the panels unsightly (1) • May need planning permission (1) which might not be granted (1). <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
10	<p>1 mark for each characteristic identified, up to a maximum of 2 marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • The recycle/reuse of waste water eg. flushing toilets (1) • Storage of water from baths and sinks (1) • Separation of waste water by degree of contamination (1) • Limited treatment required (1) • Filters/strains water (1) • Reduces use of mains water (1) <p>Accept any other appropriate answers.</p> <p>Do not accept cost as this is relative.</p>	(2)

Question Number	Answer	Mark
11	<p>1 mark for one way identified.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Protective fencing (1) • Routing of temporary site roads (1) • Plan to minimise construction activities near trees (1) • Avoid spoil heaps over tree root zone (1) • Minimise changes to land drainage (1) • Marking out an exclusion zone (1). <p>Accept any other appropriate answers.</p>	(1)

Question Number	Answer	Mark
12	<p>A linked response that makes reference to the following points. Up to 2 marks for a reason.</p> <ul style="list-style-type: none"> • It is a co-ordinated approach (1) because it seeks to limit the discharge from the site to the downstream drainage system (1) • Deals with the surface water onsite (1) by using permeable surfaces/delaying discharge/containing/slow release (1) <p>Accept any other appropriate answers.</p>	(2)

Question Number	Answer	Mark
13	<p>A linked response that makes reference to any of the following points. Up to 2 marks for an explanation.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • The building needs to have sufficient space around it (1) because pipes need to be laid in trenches (1) • The surrounding area must have suitable ground conditions (1) because of the need to excavate trenches to lay pipes (1) • Needs to have a secondary source of heating (1) in order to raise domestic hot water to a suitable temperature (1) • The floor must be able to incorporate under floor heating (1) because the temperature of the water produced works most efficiently for this application (1) • <p>Accept any other appropriate answers.</p>	(4)

Question Number	Answer	Mark
14	<p>1 mark for each of the following. Up to 2 marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • (Regular) maintenance (1) • Servicing (1) • Tuning (1) • Switching off the plant when not in use (1) • Use of bio-fuels (1) • Use of modern/new/fuel efficient plant (1) • Switch to electrically powered plant and equipment (1) • Use of equipment fitted with filters/catalytic converters (1) <p>Accept any other appropriate answers.</p>	(2)

Question Number	Answer	Mark
15	<p>1 mark for identifying an economic benefit.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Employment (1) • Training opportunities (1) • Trade for local suppliers (1) • Work for local sub-contractors (1) • Trade for local businesses (1) • Lower utility costs of new properties (1) • Lower maintenance costs of new properties (1) • Stimulate the local economy (1). <p>Accept any other appropriate answers.</p> <p>Do not accept brownfield site or recycling system.</p>	(2)

Question Number	Answer	Mark
16	<p>1 mark for identifying one reason why sealing is used.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • To reduce air leakage from the building (1) • To prevent draughts (1) • To reduce heat loss/heating bills (1) • To prevent water/rain penetration into the building (1) <p>Accept any other appropriate answers.</p>	(1)

Question Number	Answer	Mark
17 (a)	<p>1 mark for each material identified. Up to 2 marks.</p> <ul style="list-style-type: none"> • Slate (1) • Timber (1) <p>Accept no variations.</p>	(2)

Question Number	Answer	Mark
17 (b)	<p>1 mark for a definition.</p> <ul style="list-style-type: none"> the amount of energy required to produce materials/components (1) the amount of energy that has been used so far by a material (1) The total energy used in the processes up to the point of use (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
18	<p>2 marks for a linked description.</p> <p>Any one from:</p> <ul style="list-style-type: none"> Use of waste containers (1) to segregate/sort waste for recycling (1). <p>Accept any other appropriate answer.</p> <p>Do not accept the use of materials from existing buildings as these have been removed.</p>	(2)

Question Number	Answer	Mark
19	<p>A linked response that makes reference to any of the following points. Up to 2 marks for an explanation.</p> <p>Any two from:</p> <ul style="list-style-type: none"> Provide a focal point for the local community (1) therefore increasing social cohesion/promotes inclusion (1) Provides recreational activities/opportunities (1) therefore increasing the health and wellbeing of the community (1) Provides off-street play for children (1) therefore reducing the chances of children being involved in traffic accidents (1) Allows the people in the local community to interact with/access nature (1) producing positive psychological effects/by providing a natural environment for wildlife (1). <p>Accept any other appropriate answers. Do not accept generic responses relating to carbon dioxide/producing oxygen.</p>	(4)

Question Number	Indicative content	Mark
20	<p>Discussion of improvements that could be made to Building 1 to improve its sustainability.</p> <ul style="list-style-type: none"> • An increase in insulation could be provided by adding insulation to the floors, walls and roof. This will reduce heat loss thus reducing the need for heating. Placing further insulation in some locations will be easier than in others. • Double glazing or triple glazing to replace existing single glazing will reduce heat loss and reduce the heating demand. • Draught proofing of windows (this may be achieved through the installation of double or triple glazing), doors and open flues. Some ventilation is required to provide the required number of air changes. Draught proofing will prevent the uncontrolled loss of heat and will reduce the heating demand. • Energy saving lighting through the use of various low energy lamps will reduce the use of electricity to provide suitable lighting within the house. • Consideration of photovoltaic cells for energy generation, reducing overall consumption/energy load from the national grid. • Energy efficient heating. This will reduce the energy demand and could reduce emissions. • Low water use facilities. The amount of water used could be reduced by the installation of low water use toilets and low water use showers instead of baths. The use of low water use showers will reduce the demand for hot water thus reducing the energy requirements to heat the water. <p>Accept any other appropriate answers.</p> <p>Do not accept any statements relating to new build or rebuilding of building 1.</p>	(8)

Level Mark	Descriptor
Level	Descriptor
0 0 marks	No rewardable material
1 1-3 marks	A few key points identified, or one point described in some detail. The answer is likely to be in the form of a list. Points made will be superficial/generic and not applied/directly linked to the situation in the question. The learner shows limited knowledge of sustainability.
2 4-6 marks	Some points identified, or a few key points described. Consideration of more than one method but there will be more emphasis on one of them. Most points made will be relevant to the situation in the question, but the link will not always be clear. The learner shows good knowledge of sustainability.
3 7-8 marks	Range of points described, or a few key points explained in depth. The majority of points made will be relevant and there will be a clear link to the situation in the question. The learner shows developed understanding of sustainability.

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