Mark Scheme (Final)

January 2019

BTEC Level 1/Level 2 First Certificate
Construction and the Built Environment
(21635E)

BTEC Qualifications

BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Our website subject pages hold useful resources, support material and live feeds from our subject advisors giving you access to a portal of information. If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2019
Publications Code 21635E _1901_MS

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.

SECTION A

Question Number	Answer	Mark
1	**One** mark for each correct answer: **B-** Steel (1) **D**- PVCu (1)	(2)

Question Number	Answer	Mark
2	Award **one** mark for giving each benefit for building houses with their rear elevation facing south. Up to **two** marks. Any two from: • Maximise warmth/solar gain from the Sun (1) • Maximise light from the Sun (1) • Sun will shine on the rear of the house for most of the day (1) • Maximise sunlight to rear garden (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
3	**One** mark for each correct answer: **A-** Stone window sill (1) **E**- Timber door frame (1)	(2)

Question Number	Answer	Mark
4	Award **one** mark for stating a way in which waste plasterboard can be disposed of to minimise the impact on the environment. Any one from: • Specialist landfill sites (1) • Specialist recycling centre (1) • Return to manufacturer (1) • Specialist disposal facility (1) **Accept any other appropriate answer.**	(1)

Question Number	Answer	Mark
5	Award **one** mark for giving each way in which the use of modular dimensions can contribute to sustainability. Up to **two** marks. Any two from: • Materials require less/no cutting (1) • Reduced waste (1) • Materials fit together easily (1) • Speed up the construction process (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
6	**One** mark for stating a reason why people who live in low-lying coastal areas may be affected by global warming Any one from: • Rising sea levels (1) • Greater risk of flooding (1) • Increased coastal erosion (1) **Accept any other appropriate answer.**	(1)

Question Number	Answer	Mark
7	**One** mark for stating the pollution that will be reduced by the use of silencers on a construction plant. • Noise (1) **Accept any other appropriate answer.**	(1)

Question Number	Answer	Mark
8	Award **one** mark for giving each way in which dedicated cycle tracks encourage people to cycle. Up to **two** marks. Any two from: • Safer for cyclists (1) • Direct routes are created (1) • Quicker journeys are possible (1) • Less costly than driving/paying for parking (1) • Separation of traffic/pedestrians (1) • Reduced impact of exhaust emissions on the cyclist (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
9	Award **one** mark for giving each way that environmental damage may be caused by the loss of an area of woodland. Up to **two** marks. Any two from: • Loss of biodiversity (1) • Loss of animal habitats (1) • Aesthetics (1) • Loss of natural flood alleviation (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
10	A linked response that makes reference to any two of the following points. Up to **two** marks for each description. Any two from the following descriptions: • By controlling any harmful gases (1) so they do not harm anyone (1) • Planting (grass and trees) (1) to create recreation areas/local habitats for wildlife /improve the aesthetics (1) • Sealing the landfill with good quality cover (e.g. subsoil and topsoil) (1) to form a protective layer (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
11	**One** mark for each correct answer: **B-** Carbon emissions (1) **C**- Dust particles (1)	(2)

Question Number	Answer	Mark
12	**One** mark for giving one use in new construction for crushed brick and concrete from the demolition of an existing building. • Fill material (1) • Sub-base to path/patio (1) • Sub-base to solid floors (1) **Accept any other appropriate answer.**	(1)

Question Number	Answer	Mark
13	Award **one** mark for stating each piece of information that a contractor may include in a project newsletter sent to residents before construction work starts. Up to **two** marks. Any two from: • Start date (1) • Duration of the work (1) • Working hours (1) • Who to contact with questions (1) • General project information (1) • About the Considerate Constructors Scheme (1) • Benefits they are providing to the community (1) • Safety/trespass/security (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
14	Award **one** mark for giving each economic reason for spending money on flood defences. Up to **two** marks. Any two from: • Prevent the costs associated with the disruption caused by flooding (1) • Prevent the cost of refurbishing flood affected properties (1) • Prevent the cost of clearing up after flooding (1) • To help residents gain insurance cover (1) • To reduce insurance cover (1) • Maintain property prices (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
15	A linked response that makes reference to any two of the following points. Up to **two** marks for each explanation. Any two from the following descriptions: • The material is from animals (1) thus it is naturally occurring (1) • The wool is cut from the sheep (1) and it will regrow so it can be cut again (1) • Farmers will breed sheep (1) so there is a constant source of material (1)	(2)

	Accept any other appropriate answer.	
Q**uestion Number**	**Answer**	**Mark**
16	A linked response that makes reference to any two of the following points. Up to **two** marks for each explanation. Any two from the following explanations: • Land has been previously developed (1) so no further loss of the greenfield (1) • Land may be contaminated (1) and this will be cleared up (1) • Land may have little planting or biodiversity (1) this can be introduced within the new build (1) • Infrastructure will be in place (1) so land will not be disrupted to put this in place (1) • Animal habitats will not be destroyed (1) so animals will not have to be relocated (1) **Accept any other appropriate answer.**	(4)

SECTION B

Question Number	Answer	Mark
17	**One** mark for stating one water saving fitting that could have been installed to Building 1 other than dual flush toilet cisterns. • Push operated taps (1) • Flow restrictors (1) • Eco shower heads (1) • Sensor taps (1) **Accept any other appropriate answer.**	(1)

Question Number	Answer	Mark
18	A linked response that makes reference to the following points. Up to **two** marks for an explanation. • Operator has a choice of two volumes of water that can be discharged (1) with less water used when the low volume flush is used (1) **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
19	**One** mark for stating one type of high energy efficient boiler that could be installed in Building 1 to heat water for heating and domestic use. • Condensing boiler (1) • Combination condensing boiler (1) • Combined heat and power boiler (1) **Accept any other appropriate answer.**	(1)

Question Number	Answer	Mark
20	A linked response that makes reference to any two of the following points. Up to **two** marks for each explanation. • Prevents ingress of water through the windows when they are closed (1) to prevent damage to the interior of the building (1) • Prevents drafts through the windows when they are closed (1) assisting in making the building airtight/allowing the exchange of cooler external air with warmer internal air (1) **(Discuss at pre-stand – sound transmission)** **Accept any other appropriate answer.**	(2)

Question Number	Answer	Mark
21	A linked response that makes reference to any two of the following points. Up to **two** marks for each explanation. Any two from the following explanations: • Vandalism (graffiti) (1) making the buildings look uncared for and encouraging further antisocial behaviour (1) • Community feeling unsafe (1) due to the area becoming run down/fear of the people the building attracts (1) • Crime/breaking into the building (1) leading to squatters/drug taking/alcohol abuse (1) **Accept any other appropriate answer.**	(4)

Question Number	Answer	Mark
22	A linked response that makes reference to any two of the following points. Up to **two** marks for each explanation. • The water is initially stored in the underground soakaway (1) and will percolate into the subsoil (1) • Surface water is disposed of locally (1) requiring no sewerage system to allow it to flow to a disposal point (1) • Eliminates any problems/flooding further down the catchment area (1) because the water has been disposed of where the rain fell (1)	(2)

Question Number	Indicative content	Mark
23	Discussion on the improvements that could be made to the Building 2 flats to make them sustainable homes. The response required is a discussion on the improvements that could be made to the Building 2 flats to turn them into sustainable homes. The discussion should be based on the materials provided within the scenario. <u>Key points to consider:</u> • How much of the existing building can be retained – walls, floors and roof. Roof covering may be close to the end of its life. • What is likely to need replacing – windows, rainwater goods, doors, internal services, kitchens and bathrooms. • Existing building is unlikely to be very energy efficient. Improvements that could be made are: double glazed windows with energy efficient frames, insulated front door, cavity wall insulation, roof insulation, energy efficient lighting and water fittings. Insulation to the ground floor is unlikely to be feasible or cost effective. • Security. <u>Level 3 model response:</u> From the photograph the existing flats look to be in a reasonable condition. It should be possible to retain the external structure and make	

	improvements to create sustainable homes. The existing flats are not well insulated and in winter heat will be lost through the walls, windows and roof. The interior of the flats will need upgrading with more sustainable fittings. The existing brick walls can be retained, but the cavity could be filled with insulation to reduce heat loss. The current single glazed windows can be replaced with double or triple glazing to reduce heat loss. PVCu frames for the new windows will provide more insulation than the existing steel frames, which are also unlikely to be airtight and will allow drafts. PVCu frames will also require less maintenance than the existing window frames. The solid ground floor is not thermally efficient and will allow heat loss into the ground below. Adding insulation to the floor would be a big job. Some insulation can be provided with a suitable underlay to carpets. The roof looks as if it may have some moss and lichen growth. This could be cleaned off to improve the appearance and the existing roof tiles, which may still be in good condition. There is no mention of any insulation within the roof space. A good quantity of insulation, such as sheep's wool, a natural material, should be placed between and over the ceiling joists. The rainwater goods are cast iron and after 60 or so years these are likely to be leaking. These can be replaced with PVCu that are self-coloured and will not require decoration. The cast iron can be recycled. The interior of the flats can be upgraded with new timber doors and skirtings using FSC certified materials. LED lighting will reduce energy consumption. Heating of hot water and central heating could be via a condensing gas fired combination boiler. These boilers have a high energy rating and no hot water will need to be stored. Weather compensating controls can be used to control the heating for maximum efficiency and this will reduce the amount of gas used. Water fittings such as a dual flush toilet cistern can be used to reduce water usage. There is little security to prevent unwanted visitors entering the blocks. An external self-closing door to the hallways could be provided. The door could be operated by an intercom with	

	a camera so residents can see who is calling before they open the door. It appears that there is just one street light to illuminate the footpaths. Further external lighting could be provided to allow residents to see where they are walking. This extra lighting would also make the area safer. If LED lighting controlled by dusk to dawn sensors is installed, this should not be costly to run. A range of improvements that could be made to Building 2 have been discussed above. There are a number of improvements that can be made to reduce heat loss and thus reduce the carbon footprint of the flats. Other improvements to internal services such as lighting, heating and water use will both save on the use of resources and will also make the flats more pleasant to live in. Overall, the improvements discussed will make what is currently an empty block of flats into sustainable homes.	(8)

Level	**Descriptor**
0 0 marks	No rewardable material
1 1-3 marks	A few points identified, or one point described. 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. Shows a basic understanding of sustainable construction.
2 4-6 marks	Some points identified, or a few key points described or explained. The answer is unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear. Shows a good understanding of sustainable construction.
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. Shows a developed understanding of sustainable construction.