

Mark Scheme (Results)

June 2019

NQF BTEC Level 1/Level 2 First Award
Construction and the Built Environment

(21492E)

Unit 1: Construction Technology

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Question Number	Answer	Mark
1(a)	1 mark for each of: Guttering - Weather resistance Sheep's wool - Thermal insulation	(2)

Question Number	Answer	Mark
1(b)	B - Glass fibre E - Cellulose	(2)

Question Number	Answer	Mark
1(c)	1 mark for each of: <ul style="list-style-type: none"> • Keeps sound/noise in • Keeps sound/noise out • Prevents nuisance noise from adjacent neighbours/reduce complaints • Reduces external infrastructure noise • Provides confidentiality/privacy • To resist the passage of sound through the structure • Reduces aircraft noise. <p>Up to a maximum of one mark Accept any other appropriate answers</p>	(1)

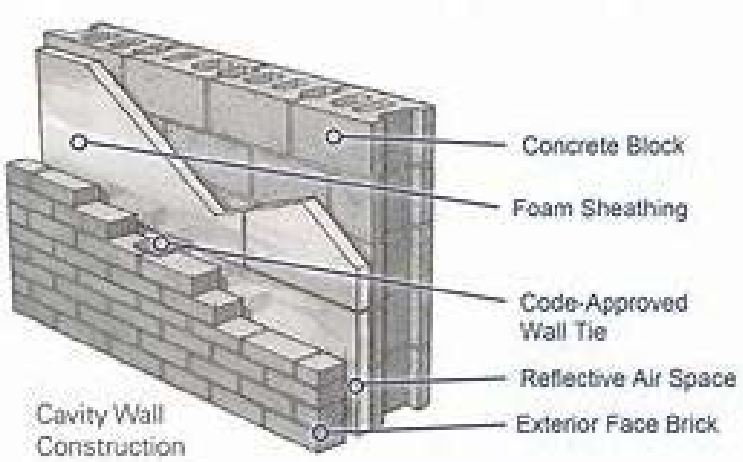
Question Number	Answer	Mark
2	1 mark for each of: <ul style="list-style-type: none"> • Windows orientated south • Bigger glass surface areas/more windows/skylights • Sun/light tubes/collectors • Light coloured reflective wall finishes <p>Up to a maximum of one mark Accept any other appropriate answers</p>	(1)

Question Number	Answer	Mark
3 (a)	1 mark for each of: <ul style="list-style-type: none"> • Timbering (walling) • Steel trench sheets • Hydraulic trench supports • Aluminium walling • Batter the sides of the excavation • Trench box/ Caisson Up to a maximum of two marks Accept any other appropriate answers	(2)
Question Number	Answer	Mark
3(b)	B – Water D – Electricity	(2)

Question Number	Answer	Mark
4	A - Pile D - Strip	(2)

Question Number	Answer	Mark
5	1 mark for each correct label: <ol style="list-style-type: none"> (i) Tiles (ii) Fascia (iii) Insulation (iv) Gutter (v) Soffit Up to a maximum of five marks	(5)

Question Number	Answer	Mark
6(a)	C - Provide ventilation E - Provide light	(2)

Question Number	Answer	Mark
6(b)	<p>Marks should be awarded for appropriate placing of the components of the diagram.</p> <p>One mark awarded for each label or fill pattern Up to a maximum of four marks.</p>  <p>1 mark for brickwork/outer wall/leaf 1 mark for wall tie 1 mark for insulation 1 mark for blockwork/inner wall/leaf 1 mark for plasterboard/render/plaster 1 mark for cavity 1 mark for DPC</p> <p>Accept similar valid alternative sketches.</p>	(4)
7(a)	<p>1 mark for any of the following:</p> <ul style="list-style-type: none"> • Screeded • Chipboard • Softwood floorboards (tongue-grooved) • Paint • Varnish • Carpets • Tiles/quarry tiles/ceramic tiles/porcelain tiles • Lino/linoleum/vinyl/laminate • Concrete • Stone • Marble • Terrazzo • Granite • Cork • Slate • Skirtings <p>Up to a maximum of one mark.</p> <p>Accept any other appropriate answers.</p>	(1)

Question Number	Answer	Mark
7(b)	<p>Two marks for any of the following explanations of advantages of a solid ground floor construction form. One mark for identification and one mark for a linked explanation, up to two marks per explanation. Up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Less complex (than other forms of construction) (1) so will require less skilled labour/ be less costly/ be quicker to construct (1) • Not prone to fungal attack (1) therefore does not require ventilation/has a longer life span (1) • Better fire resistance (1) because there are no combustible materials (1) • Less deflection/movement (1) because the floor is fully supported by the ground (1) • Better for areas prone to flooding (1) because a solid floor would not be damaged by floodwaters (1) • Easy to install under floor heating (1) because pipework can be incorporated into the structure (1) • Greater flexibility in the positioning of lightweight internal partitions (1) because concrete has a high compressive strength and bears directly on the ground (1) • Easier to incorporate insulation (1) because insulation is fully supported/does not need to be installed between joists (1) <p>Accept any other appropriate answers.</p>	(4)

Question Number	Answer	Mark
7(c)	<p>Two marks for any of the following explanations of advantages of using a beam and block floor instead of a suspended timber floor. One mark for identification and one mark for a linked explanation, up to two marks per explanation. Up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Provides an immediate safe working platform (1) allowing continuation by following trades (1) • All weather construction (1) can be installed in adverse weather conditions as everything is pre-cast (1) • Rigid floor (1) without the bounce or creaking associated with suspended timber floors (1) • Not prone to fungal attack (1) therefore has a longer life span (1) • Fire resistance (1) non-combustible materials used in the construction form (1) • Resistance to sound transmission (1) denser materials used in construction form (1) • Prefabrication of beam and block floor (1) allows speedier form of construction (1) <p>Accept any other appropriate answers.</p>	(4)

Question Number	Answer	Mark
8	<p>Two marks for any of the following explanations of advantages of the use of engineered timber joists compared to solid timber joists.</p> <p>One mark for identification and one mark for a linked explanation, up to two marks per explanation. Up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Structurally more stable (1) so will not shrink/warp/twist (1) • Less site wastage(1) as joists are made to measure (1) • Lighter than equivalent solid timber joists (1) so easier handling and placing on site (1) • Longer continuous spans (1) eliminating the need for intermediate support walls (1) • Structurally efficient (1) so less material required to achieve same span/loading (1) • Larger holes can be cut in the web (1) to facilitate service installation (1) <p>Accept any other appropriate answers.</p>	(4)

Question Number	Answer	Mark
9	<p>Two marks for any of the following explanations of the disadvantage that tile cladding has compared to brickwork.</p> <p>One mark for identification and one mark for a linked explanation, up to two marks per explanation. Up to a maximum of two marks.</p> <ul style="list-style-type: none"> • Easily damaged (1) as are prone to wind damage/ low level tiles may be hit and damaged/during maintenance activities (1) • Requires more complex detailing (1) around openings (1) • Risk of injury (1) people can get injured from falling tiles (1) • May require greater maintenance (1) due to tiles potentially being less durable (1) <p>Accept any other appropriate answers</p>	(2)

Question Number	Answer	Mark
10	<p>Two marks for any of the following explanations of an economic benefit of using a prefabricated concrete cross-wall structural form.</p> <p>One mark for identification and one mark for a linked explanation, up to two marks per explanation.</p> <p>Up to a maximum of four marks.</p> <ul style="list-style-type: none"> • Fast build form of construction on site (1) allowing developer to recoup investment quicker (1) • Requires less skilled labour to erect (1) therefore reducing labour costs (1) • Lower volume of waste removal on site due to factory controlled quality assured prefabricated units being used (1) therefore reducing site removal/landfill costs (1) • Prefabricated components ensure efficient use of material, no over ordering (1) compared to on-site construction with increased wastage of materials and resulting costs (1) <p>Accept any other appropriate answers</p>	(4)

Question Number	Indicative content	Mark
11	<p>Advantages of building on a greenfield:</p> <ul style="list-style-type: none"> • Provides maximum design flexibility to meet project requirements • Lower design costs for the property developer • Reduces potential contingency costs as a result of existing service diversions • Potential lower sub-structure costs • More attractive to buyers • No clean up costs or constraints from previous building • May be less planning constraints • Green space and wooded areas can be retained with existing biodiversity <p>Disadvantages of building on a greenfield site:</p> <ul style="list-style-type: none"> • Damage to the natural environment • Council approval timeframes may be longer • Need to develop infrastructure such as roads, services- Tree preservation orders may be in place - could increase development costs as they will need to design around them • Protected species - increase during site investigate - increase construction costs are measure will need to be put into place to protect them (newt fences, etc) • Increased time in gaining planning permission due to objections from local residents and environmental pressure groups • Loss of view, scenery • Destroying Habitats 	(8)

Advantages of building on the former industrial estate:

- Environmental benefits as the site will be cleaned up and clean from contaminants
- Regeneration of the disused site because the derelict site will be developed
- Council more likely to grant the property developer planning permission
- Existing infrastructure may be in place
- Structures and services can be utilised without major upgrades (i.e. electrical, drainage, water, gas, telecommunication)
- Employment may also be created
- Access roads and transport may already be in place
- The housing development may bring more green areas with the possible development of recreational/sporting parks
- Potential regeneration of the area with improved social benefits
 - prevents development on greenfield sites
 - possibility to reduce local crime/vandalism in relation to the existing site

Disadvantages of building on the former industrial estate:

- Design options may be compromised to suit existing design constraints
- Site location may pose operating difficulties in terms of traffic congestion
- Existing structures and service issues
- Unforeseen contingency costs - foundations, storage tanks, pipelines, basements
- Contamination issues due to the previous industrial site

Accept any other valid response

Level	Mark	Descriptor
0	0 marks	No rewardable material
1	1-3 marks	Basic arguments for both sites identified, or only one form considered. 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 displays a basic understanding of the advantages and disadvantages of building in brownfield and/or greenfield sites.
2	4-6 marks	Arguments for and against are described, but there will be more emphasis on one site than the other. The answer will be unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear. The learner displays a good understanding of the advantages and disadvantages of building in brownfield and greenfield sites.
3	7-8 marks	Balanced discussion of both sites for and against. The majority of points made will be relevant and there will be a clear link to the situation in the question. The learner displays a developed understanding of the advantages and disadvantages of building in brownfield and greenfield sites.