

Mark Scheme (Results)

June 2015

BTEC Level 1/Level 2 First Award in  
Construction and the Built Environment  
(21492E)  
Unit 1: Construction Technology

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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 judgement 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	B – Installation of site accommodation C – Gates and security of site	(2)

Question Number	Answer	Mark
2(a)	1 mark for each of: <ul style="list-style-type: none"> <li>• Reduction in energy costs</li> <li>• Provide an acceptable u-value / comply with building regulations</li> <li>• Reduction of heat loss</li> <li>• Prevention of heat gain</li> <li>• To prevent water in pipes from freezing</li> </ul> <p>Accept any other appropriate answers Up to a maximum of two marks</p>	(2)

Question Number	Answer	Mark
2(b)	1 mark for each of: <ul style="list-style-type: none"> <li>• Floor</li> <li>• Ceiling</li> <li>• Party walls</li> <li>• Internal partition walls / internal walls / walls</li> </ul> <p>Accept any other appropriate answers Up to a maximum of two marks</p>	(2)

Question Number	Answer	Mark
2(c)	D - Flashings E – Double glazing	(2)

Question Number	Answer	Mark
2(d)	1 mark for each of: <ul style="list-style-type: none"> <li>• Fire resistant materials (plasterboard, concrete, blockwork)</li> <li>• Intumescent strips</li> <li>• Sprinkler systems</li> <li>• Cavity fire barriers</li> <li>• Fire compartments</li> <li>• Fire doors / auto closing doors</li> </ul> <p><b>Do not accept fire extinguisher or fire/smoke alarm on its own.</b></p> <p>Accept any other appropriate answers. Up to a maximum of two marks.</p>	(2)

Question Number	Answer	Mark
2(e)	A – Snow D – Self-weight	(2)

Question Number	Answer	Mark
3(a)(i)	raft	(1)

Question Number	Answer	Mark
3(a)(ii)	pile/driven steel pile/short bored pile/concrete pile/displacement pile	(1)

Question Number	Answer	Mark
3(a)(iii)	strip	(1)

Question Number	Answer	Mark
3(b)	<p>1 mark for identification and 1 mark for an explanation of the advantage/disadvantage, up to a maximum of 2 marks per explanation.</p> <p>2 marks for one advantage explained:</p> <ul style="list-style-type: none"> <li>• Economic/cost effective (1) because it eliminates the need for multiple trades / concrete is cheaper than trench blocks (1)</li> <li>• Easier to construct (1) because there are fewer operations/the concrete is poured directly into the trench (1)</li> <li>• Simpler system (1) therefore quicker to construct (1)</li> <li>• Safer (1) because it reduces the time personnel need to work in the trench (1)</li> <li>• Need for earthwork support is reduced (1) sides of the trench are stabilised as soon as the concrete is poured (1)</li> </ul> <p>2 marks for one disadvantage explained:</p> <ul style="list-style-type: none"> <li>• Uneconomic in poor ground conditions (1) because of higher volume of concrete is required (1)</li> <li>• More difficult to position service ducts (1) because they have to be accurately placed within the mass concrete foundation / difficult to retrofit (1)</li> </ul> <p>Accept any other appropriate answers.</p> <p>Up to a maximum of four marks.</p>	(4)

Question Number	Answer	Mark
4	(i) – weephole/cavity vent/cavity drain (ii) – window (glass) (iii) – wall tie (iv) – cavity tray/cavity gutter/DPC (v) – lintel  Accept any other appropriate answers.	(5)

Question Number	Answer	Mark
5	<p>1 mark for each component up to a maximum of 5 marks</p> <p>Marks should be awarded for appropriate placing of the components of the diagram.</p> <ul style="list-style-type: none"> <li>• internal finish</li> <li>• plasterboard</li> <li>• vapour barrier</li> <li>• insulation</li> <li>• sheathing / plywood / OSB</li> <li>• breather membrane</li> <li>• wall tie</li> <li>• external brickwork / cladding</li> <li>• timber structural frame / studs / noggins</li> <li>• sole plate or levelling batten</li> <li>• dpc</li> <li>• cavity / cavity tray / weep holes</li> </ul> <p>Examples of an acceptable sketch with appropriate labelling:</p> <p>Accept similar valid alternative sketches</p>	(5)

Question Number	Answer	Mark
6(a)	<p>1 mark per function identified:</p> <ul style="list-style-type: none"> <li>• to waterproof the structure</li> <li>• method of discharging rainfall</li> <li>• aesthetics</li> <li>• provides additional accommodation/space</li> <li>• protection from the weather</li> <li>• shelter</li> <li>• to provide external recreational area (roof garden/terrace)</li> <li>• provide lateral restraint to external walls</li> <li>• to withstand loads e.g. snow</li> </ul> <p>Accept any other appropriate answers.</p> <p>Up to a maximum of one mark</p>	(1)

Question Number	Answer	Mark
6(b)	<p>B – Wall plate E – Jack rafter</p>	(2)

Question Number	Answer	Mark
7	<p>1 mark per advantage identified, and 1 mark for a linked explanation, up to 2 marks per explanation.</p> <p>Any two from the following explanations using a solid ground floor instead of a suspended timber ground floor.</p> <ul style="list-style-type: none"> <li>• Cost effective (on level sites) (1) it is quicker to construct and employs less skilled labour (1)</li> <li>• Not prone to fungal attack (1) therefore does not require ventilation/is more durable/has a longer life span (1)</li> <li>• More flexibility in the positioning of lightweight internal partitions (1) because concrete has high compressive strength and bears directly on the ground (1)</li> <li>• Easier to install under floor heating (1) because pipework can be incorporated into the structure (1)</li> <li>• Easier to incorporate insulation (1) because insulation is fully supported / does not need to be installed between joists (1)</li> <li>• Better fire resistance (1) because there is no combustible materials (1)</li> <li>• Higher strength can take heavier loads (1) because it bears directly onto the ground</li> <li>• Better for areas prone to flooding (1) because a solid floor will not be damaged easily by floodwaters(1)</li> <li>• Less deflection/movement (1) because the floor is fully supported by the ground</li> </ul> <p>Accept any other appropriate answers.</p> <p>Up to a maximum of four marks.</p>	(4)

Question Number	Answer	Mark
8	<p>1 mark for identification and 1 mark for a linked explanation.</p> <p>Any one from the following explanations of ways in which construction wastage can be reduced.</p> <ul style="list-style-type: none"> <li>• Pre-fabricated units / modular components are made to measure (1) this will reduce the cutting of materials on site (1)</li> <li>• Site wastage plan put into practice through induction and training of site operatives (1) operatives are more aware of the methods and need to reduce wastage (1)</li> <li>• Correct storage of materials prior to use (1) reduces the risk of damage to materials while stored on site (1)</li> <li>• Just in time deliveries (1) removes the need for onsite storage (1)</li> </ul> <p>Accept any other appropriate answers.</p> <p>Up to a maximum of two marks.</p>	(2)

Question Number	Answer	Mark
9	<p>1 mark per reason identified, and 1 mark for a linked explanation, up to 2 marks per explanation.</p> <p>Any two explanations from the following reasons:</p> <ul style="list-style-type: none"> <li>• They are economic/cost effective (1) due to speed of construction / lean lightweight construction / cheaper than hardwood (1)</li> <li>• They can be easily modified or altered (1) therefore gives flexibility if design changes required (1)</li> <li>• Timber is a sustainable material (1) therefore reducing carbon footprint (1)</li> </ul> <p>Accept any other appropriate answers.</p> <p><b>Do not accept cheaper, quicker etc. without justification.</b></p> <p>Up to a maximum of four marks.</p>	(4)

Question Number	Indicative content	Mark
10	<p>Benefits of pre-cast concrete cross-wall construction form:</p> <ul style="list-style-type: none"> <li>• fast build programme</li> <li>• can have direct decoration to walls and ceilings with only minor surface preparation on site</li> <li>• factory installed windows</li> <li>• early 'dry-box' allowing quicker access for subsequent trades</li> <li>• variety of non-load bearing cladding systems may be used</li> <li>• pre-fabricated units have increased quality assurance resulting in reduced site wastage</li> <li>• heavy weight construction has inherent thermal mass properties</li> <li>• dense construction material has noise reduction properties</li> <li>• reduces need for skilled labour on site</li> <li>• modular design enables repetitive layout appropriate to student accommodation</li> <li>• limited impact of inclement weather on construction</li> <li>• incorporating pre-stressing technology allows floor and roofing units to be thinner in profile</li> <li>• inherent fire resistance properties</li> <li>• possible to recycle concrete</li> <li>• can be aesthetically pleasing</li> </ul> <p>Benefits of traditional brick cavity wall construction form:</p> <ul style="list-style-type: none"> <li>• client confidence perception in traditional construction form</li> <li>• the facing brickwork provides the external finish of the building so no further finish is required</li> <li>• good resistance to moisture penetration</li> <li>• good thermal insulation is possible via the use of inner leaf thermally efficient lightweight concrete blocks and insulation material within the cavity</li> <li>• reduced lead-in times due to readily available materials from a wide variety of suppliers</li> <li>• flexibility in terms of design changes</li> <li>• inherent fire resistance properties</li> <li>• possible to recycle bricks / blocks</li> <li>• can be aesthetically pleasing</li> </ul> <p>Accept any other appropriate answers.</p>	(8)

Level	Mark	Descriptor
0	0	No material deserving of reward.
1	1–3	A few benefits identified, <b>or</b> one key benefit described in some detail. The answer is likely to be in the form of a list. Only one form of construction considered. Points made will be superficial/generic and not applied/directly linked to the situation in the question. The learner displays limited knowledge of these structural forms.
2	4–6	Some benefits identified, <b>or</b> a few key benefits described. Consideration of both forms of construction but there will be more emphasis on one of them. The answer is unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear. The learner displays some knowledge of these structural forms.
3	7–8	Range of benefits described, <b>or</b> a few key benefits explained in depth. Both forms of construction are considered and the answer is well-balanced. The majority of points made will be relevant and there will be a clear link to the situation in the question. The learner displays developed knowledge of these structural forms.

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