Write your name here

Surname	Other names

Edexcel
Principal Learning

Centre Number	Candidate Number

Construction and the Built Environment

Level 2
Unit 4: Structures

Monday 11 January 2010 – Afternoon
Time: 1 hour

Paper Reference
CB204/01

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 You are working in the Planning Department as a Planning Technician developing contract programmes. Study the chart below.

Contract: Community Centre																
Activity	Weeks															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Set up site	■															
Excavation		■														
Foundations		■	■													
Steel frame				■												
Floor slab					■											
External walls				■	■	■	■									
Roof					■	■										
Roof covering						■										
Windows/Doors							■	■								
Internal walls								■	■	■						
Services									■	■	■	■				
Drylining											■	■	■			
Painting												■	■	■	■	
Flooring														■	■	
Handover																■

With reference to the chart, complete the following sentences by putting a cross ☒ in the correct box.

(a) This type of construction planning document is known as a:

(1)

A	vertical chart	☒
B	box chart	☒
C	gantt chart	☒
D	horizontal chart	☒

(b) The length of time for each activity is known as:

(1)

A	float	☒
B	element	☒
C	activity	☒
D	duration	☒

(c) Use the chart to identify the total time required for the construction of the external walls.

(1)

A	2 weeks	☒
B	3 weeks	☒
C	4 weeks	☒
D	5 weeks	☒

(d) The pathway through the programme that has an effect on the overall completion date is known as the:

(1)

.

A	contract path	☒
B	critical path	☒
C	control path	☒
D	completion path	☒

(e) Use the chart to identify when the steel frame will be erected.

(1)

A	Week 1	☒
B	Week 4	☒
C	Week 8	☒
D	Week 9	☒

(Total for Question 1 = 5 marks)

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2 You are now working for a structural engineering company as a technician in the foundation substructure division.

(a) Which of the following foundations are used to transfer loads to deeper ground that has a greater bearing capacity?

(1)

A	Piled	☒
B	Strip	☒
C	Cellular raft	☒
D	Base	☒

(b) Which of the following are used with traditional strip foundations to save time and materials in substructure construction?

(1)

A	Trench bricks	☒
B	Trench beams	☒
C	Trench blocks	☒
D	Trench pads	☒

(c) Which of the following can be introduced into concrete to strengthen foundations?

(1)

A	Rebar	☒
B	Reinforcement	☒
C	Membrane	☒
D	Fabric	☒

(d) Which of the following is used to hold the sides of an excavation to prevent collapse in weak soils?

(1)

A	Soil support	☒
B	Ground support	☒
C	Earthwork support	☒
D	Foundation support	☒

(e) Before concreting a foundation, ground water in foundation trenches can be removed by:

(1)

A	condensation	☒
B	pumping	☒
C	capillary action	☒
D	evaporation	☒

(Total for Question 2 = 5 marks)

3 You are working as an Assistant Site Manager for a local construction company and it is your first day on site. The project uses a large quantity of construction plant on site.

(a) The picture above shows an item of construction plant known as a:

(1)

A	wheeled excavator	☒
B	tracked excavator	☒
C	bulldozer	☒
D	drott	☒

(b) Which of the following are used to create piled foundations?

(1)

A	Piling rigs	☒
B	Piling towers	☒
C	Piling mixers	☒
D	Piling excavators	☒

(c) Which of the following carries loose materials over rough ground in a skip that tilts?

(1)

A	Wagon	☒
B	Lorry	☒
C	Tipper	☒
D	Dumper	☒

(d) Concrete can be distributed **quickly** on a construction site by the use of a:

(1)

A	wheelbarrow	☒
B	skip	☒
C	pump	☒
D	mixer	☒

(e) Which of the following is used on site for moving material on pallets?

(1)

A	Dumper	☒
B	Forklift	☒
C	Conveyer	☒
D	Cherry picker	☒

(Total for Question 3 = 5 marks)

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4 Working with the Sustainability Officer you are learning about prefabrication.

In the table below, put a cross ☒ in the correct box to indicate whether each item can be prefabricated in timber, concrete, both or neither.

	Timber	Concrete	Both	Neither
Staircases	☒	☒	☒	☒
Chimneys	☒	☒	☒	☒
Deep strip foundations	☒	☒	☒	☒
Flat roofs	☒	☒	☒	☒
Pitched roofs	☒	☒	☒	☒

(Total for Question 4 = 5 marks)

5 You are working as a Site Technician on the substructures which have now been completed.

(a) In the picture above, the steelwork shape is known as a:

(1)

A	skeleton frame	☒
B	span frame	☒
C	ladder frame	☒
D	portal frame	☒

(b) The steelwork shown in the picture is normally erected using cherry pickers and:

(1)

A	tower cranes	☒
B	derrick cranes	☒
C	mobile cranes	☒
D	gantry cranes	☒

(c) The columns in a steel frame structure are normally fixed, using holding down bolts, to a:

(1)

A	strip foundation	☒
B	beam foundation	☒
C	box foundation	☒
D	pad foundation	☒

(d) The holding down bolts are secured by grouting them to prevent any:

(1)

A	uplift	☒
B	movement	☒
C	settlement	☒
D	disturbance	☒

(e) The external envelope of an industrial steel building is usually covered with:

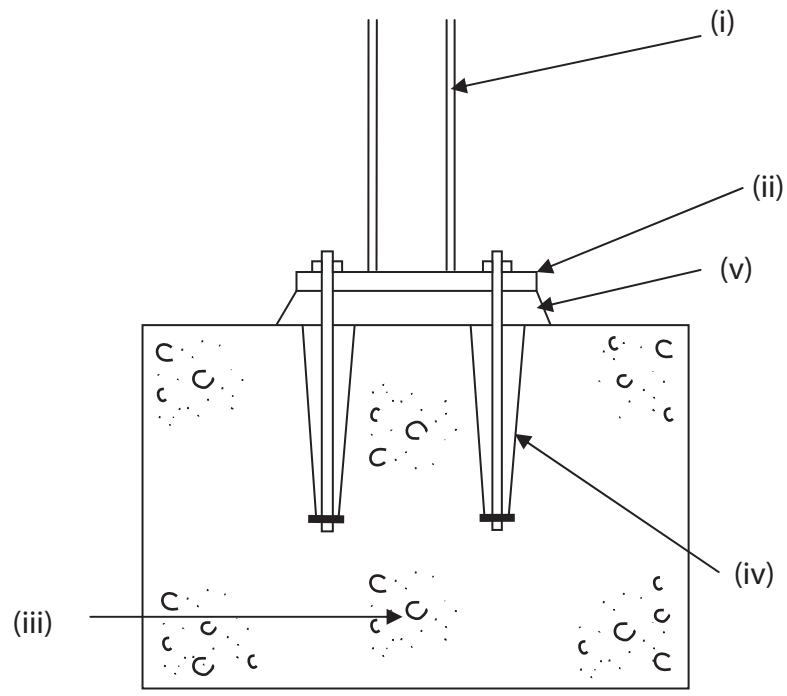
(1)

A	cladding	☒
B	glazing	☒
C	curtain walling	☒
D	timber	☒

(Total for Question 5 = 5 marks)

6 You are helping the Site Engineer to set out the foundations for the steel framed building and have been handed the section detail shown below.

Identify the different parts labelled (i) to (v) by putting a cross ☒ in the correct box.



(a) Label (i) shows:

(1)

A	wind bracing	☒
B	beam	☒
C	column	☒
D	flange	☒
E	purlin	☒

(b) Label (ii) shows:

(1)

A	base	☒
B	baseplate	☒
C	web	☒
D	flange	☒
E	cleat	☒

(c) Label (iii) shows:

(1)

A	concrete	☒
B	brickwork	☒
C	hardcore	☒
D	trench fill	☒
E	sand	☒

(d) Label (iv) shows:

(1)

A	pocket	☒
B	cone	☒
C	void	☒
D	bolt housing	☒
E	strap	☒

(e) Label (v) shows:

(1)

A	mortar	☒
B	grout	☒
C	filler	☒
D	concrete	☒
E	epoxy	☒

(Total for Question 6 = 5 marks)

7 Sustainability is an important issue for the company that you work for in its construction projects. You have been asked by the Contracts Manager to look at some sustainable site practices that could be employed on your project.

(a) Waste can be recycled by:

(1)

A	sorting	☒
B	burning	☒
C	cleaning	☒
D	tipping	☒
E	disposing	☒

(b) The impact on the community of sending excavated material to landfill can be reduced by using:

(1)

A	windscreen washers	☒
B	site security	☒
C	local contractors	☒
D	wheel cleaning facilities	☒
E	safety inspections	☒

(c) Site wastage as a result of damage can be reduced by:

(1)

A	correct storage of materials	☒
B	external storage	☒
C	waste segregation	☒
D	transfer to landfill	☒
E	recycling	☒

(d) Brickwork and blockwork waste can be recycled by:

(1)

A	compacting	☒
B	crushing	☒
C	burning	☒
D	burying	☒
E	tipping	☒

(e) Pre-cast concrete construction reduces the amount of:

(1)

A	planking and strutting	☒
B	skirting	☒
C	formwork	☒
D	hardwood	☒
E	plywood	☒

(Total for Question 7 = 5 marks)

8 You are looking into the benefits of prefabrication.

(a) Prefabrication reduces the on site employment of:

(1)

A	semi-skilled operatives	☒
B	skilled operatives	☒
C	professional operatives	☒
D	technical operatives	☒
E	management operatives	☒
F	unauthorised operatives	☒

(b) When programming construction work, prefabrication reduces the amount of:

(1)

A	materials required	☒
B	plant required	☒
C	labour required	☒
D	time required	☒
E	cost required	☒
F	skills required	☒

(c) A disadvantage of prefabrication is that it is difficult to:

(1)

A	clean	☒
B	assemble	☒
C	draw	☒
D	repair	☒
E	erect	☒
F	decorate	☒

(d) Prefabrication of components aims to ensure excellent:

(1)

A	resource control	☒
B	quality control	☒
C	site control	☒
D	quantity control	☒
E	material control	☒
F	inspection control	☒

(e) To assist following trades, prefabrication quickly produces a(n):

(1)

A	windproof envelope	☒
B	airtight envelope	☒
C	completed envelope	☒
D	fireproof envelope	☒
E	soundproof envelope	☒
F	watertight envelope	☒

(Total for Question 8 = 5 marks)

9 As an Assistant Quantity Surveyor you are working with the Bill of Quantities.

(a) A sum of money is often included to cover unforeseen work and is known as a(n):

(1)

A	approximate sum	☒
B	contract sum	☒
C	allocated sum	☒
D	free sum	☒
E	costing sum	☒
F	contingency sum	☒

(b) Work that cannot be measured will often be valued using:

(1)

A	prime rates	☒
B	daywork rates	☒
C	hourly rates	☒
D	cost rates	☒
E	bill rates	☒
F	approximate rates	☒

(c) The preliminaries section of a Bill of Quantities covers:

(1)

A	client's work	☒
B	services	☒
C	demolition	☒
D	general conditions	☒
E	measured items	☒
F	groundworks	☒

(d) Work by a client's mechanical subcontractor that has not yet been finalised would be included in a:

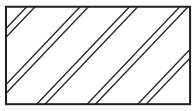
(1)

A	contract sum	☒
B	provisional sum	☒
C	principle sum	☒
D	private sum	☒
E	product sum	☒
F	costing sum	☒

(Total for Question 9 = 4 marks)

10 The following are symbols taken from a drawing on the project you are working on, The Site Manager has asked you to identify what they represent.

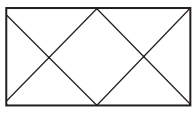
(a)



(1)

A	Blockwork	☒
B	Brickwork	☒
C	Cement	☒
D	Mortar	☒
E	Concrete	☒
F	Plywood	☒

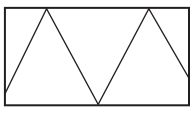
(b)



(1)

A	Blockwork	☒
B	Asphalt	☒
C	Glass	☒
D	Metal	☒
E	Hardcore	☒
F	Mesh	☒

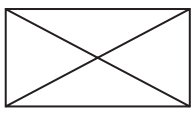
(c)



(1)

A	Screed	☒
B	Concrete	☒
C	Hardcore	☒
D	Glass	☒
E	Insulation	☒
F	Hardboard	☒

(d)



(1)

A	Timber sawn	☒
B	Timber softwood	☒
C	Timber hardwood	☒
D	Timber planed	☒
E	Timber treated	☒
F	Timber wrot	☒

(Total for Question 10 = 4 marks)

11 You are working in the Planning Department. You have been asked to compare and evaluate framed and shell methods of construction.

In the table below, put a cross ☒ in the correct box to indicate which statements could apply to a framed structure, a shell structure, to both or to neither.

	Framed	Shell	Both	Neither
Requires no foundation	☒	☒	☒	☒
Transfers loads using the building envelope	☒	☒	☒	☒
Utilises a modern foundation	☒	☒	☒	☒
Transfers loads using secondary units	☒	☒	☒	☒

(Total for Question 11 = 4 marks)

12 Specifications are essential documents used in the construction of a project.

Describe **one** difference between a performance specification and the materials/ workmanship specification.

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(Total for Question 12 = 2 marks)

13 Construction projects can have a significant impact on the local community.

Describe and evaluate **three** methods that could be used to minimise the effect of a project on the surrounding community **during the construction phase**.

1 .....

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2 .....

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3 .....

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(Total for Question 13 = 6 marks)

TOTAL FOR PAPER = 60 MARKS

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