

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF BUILT ENVIRONMENT

DEPARTMENT OF QUANTITY SURVEYING

PART I SUPPLEMENTARY EXAMINATIONS – AUGUST 2010

LAW: CONSTRUCTION AND ENGINEERING I – AQS1205

Time: 3 hours

Total Marks: 100

INSTRUCTIONS:

Answer any four questions, all questions carry equal marks.

QUESTION ONE

- a) Discuss private nuisance and the remedies available to the injured party. (10 marks)
- b) Explain your understanding of the delict of trespass. (5 marks)
- c) What does the work of a Quantity Surveyor include? (5 marks)
- d) Outline circumstances in which an offer lapses. (5 marks)

QUESTION TWO

- a) A contract usually comes into being by way of an offer and acceptance. With the aid of examples and case law authorities discuss the requirements for:-
 - i) Valid offer. (12 marks)
 - ii) Valid acceptance. (8 marks)
- b) Name the requirements of a valid contract . (5 marks)

QUESTION THREE

- a) What are the remedies for a breach of contract? (10 marks)
- b) Discuss the remedies for tortious behaviour. (10 marks)
- c) Discuss the tort of negligence. (5 marks)

QUESTION FOUR

- a) What is law? (2 marks)
- b) Differentiate the Law of Contract from the Law of Tort. (5 marks)
- c) Differentiate between revocation and reflection. (4 marks)
- d) What is a Tort? (2 marks)
- e) Explain various types of mistakes. (7 marks)

QUESTION FIVE

- a) What is misrepresentation? (2 marks)
- b) Explain various types of misrepresentations. (8 marks)
- c) Define subcontracting and explain why it is prevalent in the construction industry? (10 marks)
- d) What are damages and explain with examples. (5 marks)

END OF EXAMINATION

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DEPARTMENT OF QUANTITY SURVEYING

PART I SUPPLEMENTARY EXAMINATIONS – AUGUST 2010

THEORY AND PRACTICE OF QUANTITY SURVEYING AND PROJECT MANAGEMENT I – AQS1101

Time: 3 hours

Total Marks: 100

INSTRUCTIONS:

Answer all questions.

QUESTION ONE

What are the advantages and disadvantages:-

- a) Bills of Firm Quantities. (5 marks)
- b) Bills of Approximate Quantities. (5 marks)
- c) Design and Build. (5 marks)
- d) Management Contracting. (5 marks)
- e) Project Management (5 marks)

QUESTION TWO

What are the four tendering methods used in Zimbabwe? (25 marks)

QUESTION THREE

Define the following terms:-

- a) Fluctuations. (5 marks)
- b) Bills of Quantities (5 marks)
- c) Standard Method of Measurement. (5 marks)
- d) Building Contract. (5 marks)
- e) Variations. (5 marks)

QUESTION FOUR

Outline the financial and contractual duties of a Quantity Surveyor. (25 marks)

END OF EXAMINATION

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DEPARTMENT OF QUANTITY SURVEYING
PART I SUPPLEMENTARY EXAMINATIONS – AUGUST 2010
MEASUREMENT I – AQS1203

Time: 3 hours

Total Marks: 100

INSTRUCTIONS:

Answer all questions.

QUESTION ONE

- a) What are the general rules of abstracting? (10 marks)
- b) Write short notes on the general requirements of framing descriptions and order of taking off. (10 marks)

QUESTION TWO

Mr Dhliwayo is an emerging Building Contractor who started operating as a Contractor in 2010. He graduated with a Degree in Business Administration and is not knowledgeable with the operations of the building industry. A certain client has approached Mr Dhliwayo with a plan for a residential building and wants Mr Dhliwayo to prepare a quotation for the house. Advise Mr Dhliwayo of how a Bill of Quantities is prepared, starting from the plan to the Bills of Quantities. In your report, tell him of all the documents that are used and the intermediary processes that are embedded in measurement. (30 marks)

QUESTION THREE

Using the attached plan, prepare a Bills of Quantities for the foundations. Attach all the necessary documents that result from the processes that are undertaken to come up with a bill starting from the plan up to the bill. (50 marks)

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DEPARTMENT OF QUANTITY SURVEYING

PART II SUPPLEMENTARY EXAMINATIONS – AUGUST 2010

CONSTRUCTION ESTIMATES AND PRICING – AQS2205

Time: 3 Hours

Total Marks: 100

Instructions

Answer ALL Question .

NEC Labour rates, schedule to be provided.

QUESTION ONE

a) A proposed project is situated outside the contractor's normal geographical sphere of operation. List the points which the estimator must observe when he makes a site visit before deciding on the tender figure. (10 marks)

b) Calculate the unit rate to prepare and apply 2 coats emulsion paint to wood float plastered walls from the following data.

Labour:- Painter Skilled Worker 1 is paid \$94,72/ 8 hour day

He applies 12m² for first coat in 1 hour

He applies 14m² for the second coat in 1 hour

Material:- Paint cost \$12,00 per 5 litre

First coat 68m² per 5 litre

Second coat 72m² per 5 litre

Use 10% waste where waste is expected and 12% of labour cost for brushes and sand paper.

(15 marks)

QUESTION TWO

If you have received tender documents for a factory extension, the construction to be completed in 3 months. Your planning department advises you that in order to complete the work on time you will have to allow for working the normal week, 8 hours a day Monday – Friday plus 6 hours on Saturdays.

a) Calculate the all-in labour rates for a Worker Grade 2 and Skilled Worker Grade 4. (The extra cost of overtime to be included in the all-in labour rate). (15 marks)

b) Explain with examples the following terms:-

i) Site overheads (5 marks)

ii) Head office overheads (5 marks)

QUESTION THREE

Explain with examples and giving advantages and disadvantages of the following types of approximate estimating:-

a) i) Unit method (5 marks)

ii) Cubic metre (m^3) (5 marks)

b) Using the approximate quantities method build-up a rate per square for plastered ceiling on timber branding fixed to roof trusses. Assume own rates for the various constituencies.

(15 marks)

QUESTION FOUR

a) With the aid of examples, one in each case, explain the difference between gross pricing and net pricing. Give the advantages and disadvantages for each case. (15 marks)

b) In the course of preparing a cost estimate, the Quantity Surveyor will visit the site and also arrange to call at the offices of the Architects and the Structural Engineer.

Explain the purpose of the visits to the Architect and Engineer and outline the information that he would hope to obtain indicating the effect that this would have upon the estimate.

(10 marks)

END OF EXAMINATION

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PART II SUPPLEMENTARY EXAMINATIONS AUGUST 2010
BUILDING CONSTRUCTION II - AQS2104

TIME: 3 HOURS

TOTAL MARKS: 100

INSTRUCTIONS

Answer four questions.

QUESTION ONE

- a) List the functional requirements of a good ground floor. (5 marks)
- b) With the aid of diagrams explain the difference between a solid ground floor and a suspended timber ground floor. (20 marks)

QUESTION TWO

- a) Write brief notes on the following:-
- i) Hipped roof (2 marks)
 - ii) Flat roof (2 marks)
 - iii) Northlight roof (2 marks)
 - iv) Monitor roof (2 marks)
 - v) Dormer (2 marks)
- b) Illustrate a well detailed sketch showing the junction of a reinforced concrete roof and external parapet wall with a precast coping. (15 marks)

QUESTION THREE

- a) Explain with aid of labeled plan, section and /or elevation how the following types of doors are made and situations where they can be used.
- i) Solid core panel (6 marks)
 - ii) Fire rating door (6 marks)
 - iii) Battened door (6 marks)
- b) Illustrate a labeled elevation and section of a two-panelled door with the top being glass and the bottom panel being timber. (7 marks)

QUESTION FOUR

- a) Define prestressing. (5 marks)
- b) Explain and illustrate the difference between pre-tensioned and post-tensioned concrete. (10 marks)
- c) In framed structures illustrate with aid of labeled diagrams the structural steel column base. (10 marks)

QUESTION FIVE

- a) Outline the reasons of including a suspended ceiling in a building. (5 marks)
- b) Explain and illustrate the following two types of suspended ceilings:-
- i) Jointed ceiling. (10 marks)
 - ii) Jointless ceiling. (10 marks)

END OF EXAMINATION

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PART I SUPPLEMENTARY EXAMINATIONS AUGUST 2010
BUILDING CONSTRUCTION I – AQS1110

TIME: 3 HOURS

TOTAL MARKS: 100

INSTRUCTIONS

Answer all questions.

QUESTION ONE

- a) With the aid of diagrams describe the following:-
- i) Strip foundation (6 marks)
 - ii) Pad foundation (6 marks)
 - iii) Raft foundation (6 marks)
- b) Explain how bearing capacity of soil can be improved. (7 marks)

QUESTION TWO

- a) Draw a detailed section of solid ground floor and briefly describe the purpose served by each part. (19 marks)
- b) List the advantages and disadvantages of solid concrete ground floors. (6 marks)

QUESTION THREE

- a) Outline the functions of any roof. (5 marks)
- b) Differentiate between flat roof and pitched roof. (6 marks)
- c) Identify two types of roof covering materials and explain how these can be fixed to roof members. (6 marks)
- d) Illustrate a well detailed sketch showing the junction of a pitched roof and the external wall of a building. (8 marks)

QUESTION FOUR

- a) With the aid of sketches distinguish between:-
- i) English bond and Flemish bond (5 marks)
 - ii) Block-work and Brick-work (4 marks)
- b) Outline the general principles to be observed when constructing cavity walls. (10 marks)
- c) List the advantages and disadvantages of cavity walls. (6 marks)

END OF EXAMINATION

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PART I SUPPLEMENTARY EXAMINATIONS AUGUST 2010
ENGINEERING SURVEYING – AQS1208

TIME: 3 HOURS

TOTAL MARKS: 100

INSTRUCTIONS

A non-programmable calculator.

Answer all questions.

Carry out all necessary checks.

Untidy work will be penalized.

All diagrams to be neatly drawn and labeled.

Each question carries 25 marks.

QUESTION ONE

- a) List the corrections to be applied to the measured lengths, giving the relevant formulae. (10 marks)
- b) A square field was surveyed and found to contain 70, 278 hectares. The same field was again surveyed with a 100 metre tape which on being checked, was found to be 9mm long. What will be the area of the field and length of the sides as determined by the incorrect tape? (15 marks)

QUESTION TWO

- a) Given the following coordinates, calculate the length and direction of the line AB.
- A** + 1 981, 239 - 638, 266
- B** + 959, 293 - 919, 271 (5 marks)

- b) A level line running from a point at the top of a quarry face, around the edge of the excavation, and then across it to a point immediately below the starting point, yielded the bearings given in the table below. Complete the level book by the Rise and Fall method and apply the usual checks assuming that misclosure=0

B/S	I/S	F/S	Rise	Fall	R Level	Remarks
0.440						A (top)
	1, 640					B
	2, 940					C
0, 170		3, 980				D
	2, 720					E
0, 320		4, 110				F
0, 540		3, 880				G
0, 110		4, 080				H
4, 000		3, 960			149.730	I (BM)
	2, 440					J
3, 860		0, 110				K
		0, 590				L (Bottom)

(20 marks)

QUESTION THREE

- a) What are the responsibilities of an Engineering Surveyor on a Construction Scheme?

(10 marks)

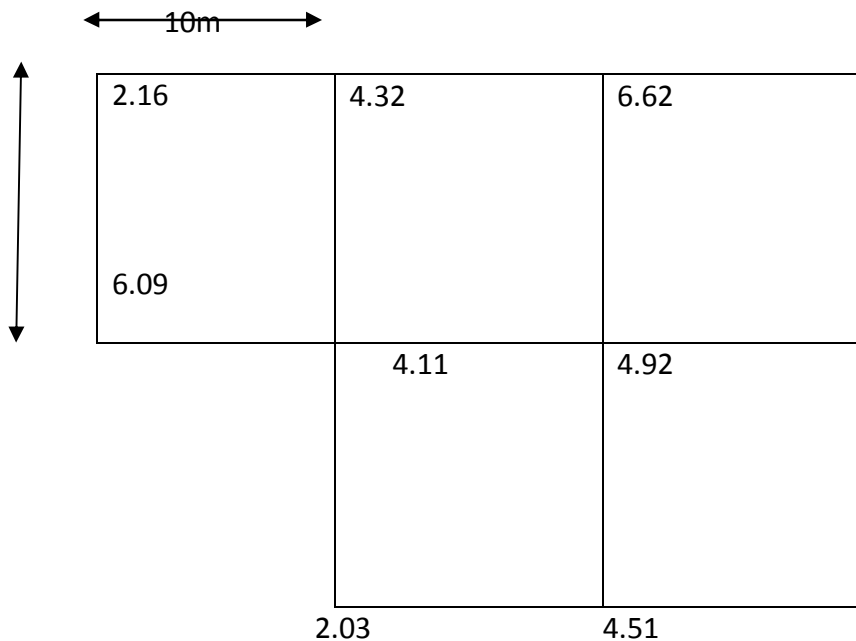
- b) It is planned to construct a dam in a mountain area. Before construction commences a network of points to monitor the movement of the dam wall at a later stage has to be constructed on the dam wall in order to monitor the movements during construction,

whilst some have to be constructed on the crown of the dam wall, in order to monitor the movements of the dam wall as the dam fills up.

Using these guidelines, describe fully how you could monitor the movements of the dam during and after construction. (15 marks)

QUESTION FOUR

- a) Briefly describe the two main classifications of surveying. (5 marks)
- b) State and explain the fundamental principle of surveying. (5 marks)
- c) The junctions of a square grid (below) were leveled to determine the volume of excavation necessary in the construction of a basement floor. The required depth of dig at each junction is shown and the horizontal side length of each grid is 10m. Calculate the volume of excavation. (15 marks)



END OF EXAMINATION

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PART II SUPPLEMENTARY EXAMINATIONS AUGUST 2010
COMPUTER APPLICATIONS IN QUANTITY SURVEYING – AQS2207

TIME: 3 HOURS

TOTAL MARKS: 100

INSTRUCTIONS

Answer all questions.

QUESTION ONE

With the use of Appendix A, prepare an Interim Valuation using the necessary computer package. All formulas should be incorporated. (30 marks)

QUESTION TWO

Prepare part of the measured work section for the Bills of Quantities from the given take-off sheets in Appendix B. Incorporate the collection pages.

- | | | |
|------|------------------------|------------|
| i) | Concrete reinforcement | (25 marks) |
| ii) | Waterproofing | (25 marks) |
| iii) | Roof coverings | (20 marks) |

END OF EXAMINATION

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PART IV SUPPLEMENTARY EXAMINATIONS AUGUST 2010

INTERNATIONAL CONSTRUCTION: CONTRACTS AND ARBITRATION – AQS4210

TIME: 3 HOURS

TOTAL MARKS: 100

INSTRUCTIONS

Answer all questions.

QUESTION ONE

- a) What are the essentials of a valid building contract? (12 marks)
- b) What is the procedure and importance of a pre-qualification process when looking for a contractor on construction project? (13 marks)

QUESTION TWO

Describe the following tendering procedures and on which type of project will they be most appropriately used.

- a) Selective tendering (12 marks)
- b) Two stage selective tendering (13 marks)

QUESTION THREE

- a) Why are preliminary costs estimates prepared? (10 marks)
- b) In preparing a construction project cost estimate what factors should an estimator consider? (15 marks)

QUESTION FOUR

Describe how the contractor for a World Bank funded Zimbabwean road construction project may be selected.

Your response should pay particular attention to the following:

- a) Criteria for selection (5 marks)
- b) International interest generated by the contract (5 marks)
- c) The countries indigenization laws (5 marks)
- d) Source of funding (5 marks)
- e) Stakeholder expectations (5 marks)

END OF EXAMINATION

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PART IV SUPPLEMENTARY EXAMINATIONS AUGUST 2010
MEASUREMENT III – AQS4107

TIME: 3 HOURS

TOTAL MARKS: 100

INSTRUCTIONS

Answer all questions.

SECTION A: PLUMBING

Question ONE

Fig P1 and P2 shows plumbing layout of cold and hot water supply for a residence. Given that

- Galvanised mild steel pipe shall be used for cold water.
- Hot water pipe shall be of copper to BS PART 1 with fittings conex or other approved compression fittings.
- Hot and cold water valves to be fullway gate valves type to BS 1952.
- All pipework to wall shall be supported by brackets or holderbats spaced at 2m centres.
- Pipes in trenches to be laid 750mm deep.
- All waste and drainage pipes to be of UPVC
- Water mains to be 20m from building
- Municipal sewer connection to be 15m from building

Required

- (a) Take off cold and hot water supply items showing all assumptions made (30 marks)
- (b) Take off the sanitary plumbing and soil drainage items (20 marks)

SECTION B: MEASUREMENT OF CIVIL ENGINEERING WORK

QUESTION TWO

Using the data given below calculate the volume of earthworks in the storm water drain that is proposed to be constructed along a road adjacent a housing development.

Overall length of drain 200m

Side slopes of the drain 1:2

Cutting base width 1.5m

The required final level of the drain is 17.0 m

- Existing ground level at end of the drain 20.0m and 19.0m at the beginning of the drain with an assumed uniform slope in between.
- Assume ground across the width of the cross-section to be level.
- Apply the Average End Areas Method. (20 marks)

QUESTION THREE

- a. With the aid of an example, describe how you would build up the rate for excavation, highlighting the factors to be considered. (10 marks)
- b. Describe the concept of bulking in earthworks and explain its importance in measurement of civil engineering works. (5 marks)

SECTION C: STRUCTURAL

QUESTION FOUR

The figure shows a roof pahn for an industrial building. Estimate the mass of steel (trusses and purlins) required. Use standard measurement sheets for your working. (15 marks)

END OF EXAMINATION