

**SIR ARTHUR LEWIS COMMUNITY COLLEGE
DIVISION OF TECHNICAL EDUCATION AND MANAGEMENT STUDIES**

EXIMINATION SESSION : May 2013
TUTOR(S) : Ms. Crescentiana Charles
PROGRAMME TITLE : Carpentry and Joinery Part 1
PROGRAMME CODE(S) : 3BD-CJ2- CE
COURSE TITLE : Building Science I- A
COURSE CODE(S) : BLS 101
CLASS (ES) : Year 1
DATE : Monday 13th May, 2013
TIME : 1:00 p.m.
DURATION : 2 1/2 hrs.
ROOM : TRB- L1/L2
INVIGILATOR(S) : **P. Jn Francois** M. St. Clair, L. Olliverre

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INSTRUCTIONS:

This examination paper contains FOUR (4) sections.

- Please number your responses accurately.
- Students are advised to use a pen to write this examination.
- Write your ID Number on *ECAH* answer sheet.
- All cell phones must be turned off and not be near or in your possession during the examination.
- **Note:** Bags, books as well as writing paper not given by the invigilator should be deposited at the front of the examination room or as otherwise indicated.
- Students must sign **IN** and **OUT** on the examination class list.
- Do not **DETACH** the pages from Question or Answer Sheets.



Section A: Multiple Choice

Read each question carefully and answer the following by shading the correct response on the answer sheet provided.

Students must answer all questions in this section.

Each question is worth 1 mark.

1. Timber is classified as hardwood or softwoods according to its:
 - a. Structure
 - b. Durability
 - c. Workability
 - d. Weight
2. Which one of the following defects occur in timber?
 - a. Corrosion
 - b. Peeling
 - c. Waney edge
 - d. Blistering
3. Common furniture beetle attack on timber can be identified by
 - a. A ticking sound
 - b. Small hole in the timber
 - c. White threads spreading across the surface
 - d. Shrinkage between brown flakes
4. Which of the following is not a part of a tree:
 - a. Heart-wood
 - b. Bark
 - c. Sap-wood
 - d. Ball rings
5. From the list below indicate which one of the following is not considered a hardwood:
 - a. Green heart
 - b. Mahogany
 - c. Yellow Pine
 - d. Balsa
6. Which of the following is not a type of grading test for timber:
 - a. Stress grading
 - b. Visual stress grading
 - c. Ball stress grading
 - d. Machine stress grading
7. Which of the following will not destroy wood:
 - a. Wet rot
 - b. Sap stain
 - c. Dry rot
 - d. Long horn beetles
8. Select the which of the following is not a type board manufactured from timber:
 - a. plywood
 - b. gypsum board
 - c. chip board
 - d. particle board
9. Dusting of concrete paved area can be caused by
 - a. Placing and curing the concrete in hot weather
 - b. Too much water in the concrete mix
 - c. Using All in aggregate
 - d. Use of long haul ready mixed concrete
10. Concrete cubes help to determine the strength of concrete in resisting;
 - a. Tensile strength
 - b. Compression stresses
 - c. Expansion conditions
 - d. Impact loading
11. Cement stored on site must be;
 - a. Protected from frost
 - b. Prevented from bulking
 - c. Used within 7 days
 - d. Kept dry
12. The aggregates in a concrete mix should be well graded in order to;
 - a. Provide dense concrete
 - b. Reduce the time for compacting
 - c. Improve the workability of the concrete
 - d. Reduce the amount of cement required

13. Although concrete will set and harden under water it is necessary to pump out waterlogged trenches in clayey soil before placing foundation concrete because;
- Waterlogged clay soil will have many fine particles in suspension to weaken the concrete
 - The water may stain the concrete
 - Particles in the water will chemically change the cement in the concrete
 - The finished level of the concrete will be obscured by the excess clayey water
14. The basic difference between ordinary Portland cement and rapid hardening cement is that rapid hardening cement;
- Hardens much faster
 - Contains more gypsum
 - Is grounded more finely
 - Has a higher lime content
15. An excess of water being added to a concrete mix, above the amount determined by the water/cement ratio, will result in the finish concrete being?
- Increased in strength
 - Decreased in its setting time
 - Decreased in strength
 - Increased in setting time.
16. From the list below indicate which one of the following is a Ferrous Metal
- Nickel
 - Brass
 - Cast Iron
 - Tin
17. Which one of the following is not a method of joining Metals
- Bolting and riveting
 - Soldering
 - Welding
 - Scratching Brushes
18. Which one of the following is the best finish for Ferrous Metals
- Plastic
 - Flat Paint
 - Red Paint
 - Oil Paint
19. Having distinguished the type of steel by its carbon content which one of the following is a type of steel
- High Steel
 - Carbon Mixed Steel
 - Structural Steel
 - Normal temperature steel
20. From the list below select the metal which is a non ferrous metal.
- Cast Iron
 - Steel
 - Alloy Steel
 - Copper

Section C: Science Long Answer

Read each question carefully and answer on the sheet provided.

Students must answer ANY THREE (3) QUESTIONS in this section.

Each question is worth 20marks

- 1.
- An ice block has the following characteristics; Mass 2760 kg and volume 6m^3
 - Calculate the density of the ice in a block
 - Calculate the relative density of the block of ice
(Given that the density of water is 1000 kg/m^3 .) (10 marks)
 - A concrete lintel is made in a rectangle mould with the following dimensions: Length of 200mm; Width of 150mm ; Height of 10m
Calculate:
 - The volume of the lintel. (Give answer in m^3)
 - The area of the rectangular block (Give answer in mm^2) (10 marks)

2.

- a. Fig 2.a1 is a table which illustrates a list of various elements, metals, compounds and mixtures. Reproduce and complete the table by indicating which from the list belongs in the columns labeled elements, metals, compounds and mixtures:

No.	List	Elements	Metals	Compounds	Mixtures
1	Hydrogen				
2	Carbon Dioxide				
3	Iron				
4	Calcium Carbonate				
5	Brine				
6	Sulphur				
7	Lead				
8	Air				

Fig 2.a1

(8 marks)

- b. Corrosion is the gradual destruction of a metal. Fig 2. b2 demonstrates a simple corrosion experiment.

(i) Give a brief summary of the experiment

(ii) Explain the results of each stage of the experiment.

(12 marks)

Fig 2. b2

3.

- a. A force of 200N acts over a surface area of (i) 8.1 m^2 , (ii) 2.25 m^2 and (iii) 0.19 m^2 . Calculate the water pressure in each case and explain why which of the following areas has the greatest pressure?

(12 marks)

- b. A rectangular tank contains water to a depth of 500mm. Calculate the water pressure at the bottom surface of the tank. (Given the density of water – 1000 kg/m^3 and gravitational acceleration = 9.8 m/s^2)

(8 marks)

4.

- a. A spring within its elastic limit gives an extension of 80 mm with a load of 60N. Calculate the final extension produced by a load of 20 N.

(6 marks)

- b. Fig 4.b1 illustrates the manner in which forces act when loads are applied to them. Reproduce and complete the diagram by placing the correct mechanical force where the arrow is located,

(14 marks)

Fig 4. b1

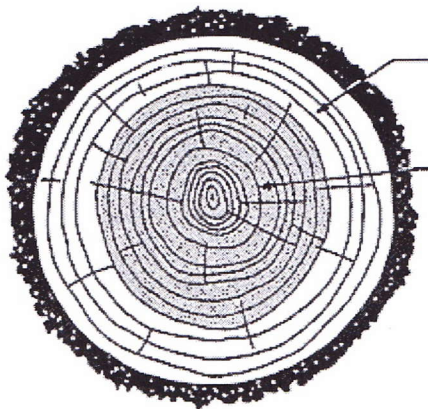
Section D: Building Materials Long Answer

Read the instructions carefully and answer the following questions on the paper provided. Students must answer ALL QUESTIONS in this section.

Each question is worth 30marks

1. (a)
- i) In brief notes explain the purpose of water in a concrete mix. **(5 marks)**
 - ii) Give and explain five reasons why one should store cement properly. **(5 marks)**
 - iii) Explain the process by which the Slump Test is conducted; and state four reasons why this test is important. **(10 marks)**
- b)
- i) List and explain the loads supported by a foundation **(5 marks)**
 - ii) Explain the importance of testing soils before the construction process. **(5 marks)**

2.



- a. Label accurately the five parts of the tree cross section. **(5 marks)**
 - b. In brief notes describe five main differences between hardwoods and softwoods. **(5 marks)**
 - c. With the aid of a well labeled diagram explain ONE of the following
 - a) Natural Seasoning
 - b) Artificial Seasoning of timbers **(10 marks)**
 - d. i) Explain what is meant by the term “Conversion of timber”. **(5 marks)**
 - ii) Using well labeled diagrams illustrate and explain two methods of timber conversion and give **ONE ADVANTAGE** and **ONE DISADVANTAGE** of each method. **(5 marks)**
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END OF EXAM