

EXAMINATION SESSION : May 2015 Final Examination
TUTOR (S) : Ms. Crescentiana Charles
PROGRAMME TITLE : Carpentry and Joinery – Part 1
PROGRAMME CODE : 3BD-CAJ-CE
COURSE TITLE : Building Science IA
COURSE CODE : BLS 101
CLASS (ES) : Year 1
DATE : Thursday 4th May 2015
COMMENCEMENT TIME : 9:00 am
DURATION : 2 hrs
INVIGILATOR (S) : H. Nicholas, P. Beausoleil
ROOM (S) : TRA-R1



#B34

INSTRUCTIONS:

- **THIS PAPER CONTAINS THREE (3) SECTION**

SECTION A – Long Answer Question; this section contains 2 questions. Students must answer all questions.

SECTION B – True and False; Short Answer: This section contains 10 True and False and 5 Short Answer questions, students must answer all questions on answer sheet provided. .

SECTION C – Multiple Choices: this section contains 40 questions. Students must answer all questions.

SECTION A

LONG ANSWER QUESTIONS

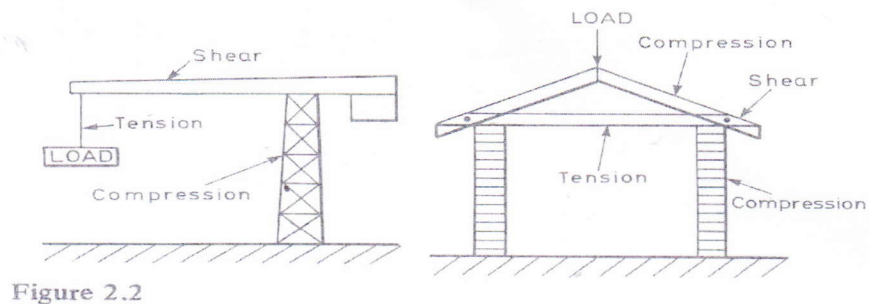
Answer the following questions on the ANSWER paper provided.

Students must answer all questions in this section.

Each question is worth **25 marks**

1.

- a. A certain copper block has a relative density of 0.189. Calculate
1. The density of the copper block
 2. The mass of the copper given the volume equals 15 m^3
 3. The Area of the copper given the HEIGHT 4 m and WIDTH 2m
- Given the density of the water = 1000 kg/m^3 . **(15marks)**
- b. Figure 2.2 shows the force diagram of two structures: **(1)** Redraw the diagrams and **(2)** complete each diagram by labelling the appropriate force acting on the structure indicated by the arrow. **(10marks)**



2.

- a. A motor supplies a force of 800N which is used to haul a load for a distance of 10m. The force is then changed to 20N and the load is hauled for a further 60m. Draw a work diagram for this operation and from the diagram, calculate the total work done. **(10marks)**
- b. Calculate the pressure on a surface when a force of 48 N acts on (1) an area of 12 m^2 of a concrete block and (2) that same force acts on 96 m^2 rectangular water which has a depth of 5m (given the density of the water to be 100 kg/m^3 and the gravitational acceleration to be 10 m/s^2) **(15 marks)**

SECTION B

TRUE AND FALSE / SHORT ANSWER

Answer the following questions on the ANSWER paper provided.
Students must answer all questions in this section.

TRUE AND FALSE

Each question is worth 1 mark

1. Are all of the following listed considered to be forces;
Speed Mass Energy Weight T/F
 2. Tension is a force which tends to stretch a material. T/F
 3. An example of objects under compression is; Springs being squeezed. T/F
 4. The materials listed are ductile materials Gold, Copper and Glass. T/F
 5. A Force (F) causes a change in either shape or the motion of a body.
The Unit of measurement is grams. T/F
 6. Work (W) = Force x Distance moved in direction of the force.
Therefore the unit of measurement is Square feet. T/F
 7. A chemical reaction always produces new substances. T/F
 8. An element is a substance which cannot be separated into anything simpler by
radiation means T/F
 9. A steam engine driving a dynamo that lights a bulb is an example of work being
done? T/F
 10. Is Copper "Cu" an element on the periodic table? T / F
-
-

SHORT ANSWER

Each question is worth 1 mark

1. A force can either be a (1) _____ or a (2) _____. Weight is a force due to the
pull of the Earth's (3) _____.
2. A television set changes (1) _____ energy to (2) _____ and (3) _____ energy.
An electric kettle changes (4) _____ energy to (5) _____ energy.
3. The density of a liquid can be measured with a (1) _____. The lower it floats in
the liquid the (2) _____ dense it is.

SECTION C

Building Material

Answer the following questions on the ANSWER paper provided.
Students must answer all questions in this section.
Each question is worth 2 marks

Ques. 1

Which one of the following is essential for the prevention of dry rot in suspended timber ground floors?

- a. Treatment of timber over site concrete
- b. Over-site concrete and damp proofing
- c. Through ventilation and damp proof course
- d. Sleeper walls and honeycombing

Ques. 2

From the table below select the nonferrous metals

Metals			
a	b	c	d
Copper	Nickel	Alloys	Copper
Lead	Copper	Brass	Zinc
Iron	Zinc	Copper	Bronzes
Steel	Tin	Bronzes	Iron

Ques. 3

The best method for testing for the correct amount of water in a concrete mix is by using?

- a. Structure test
- b. Slump Test
- c. High water content test
- d. All of the above

Ques. 4

Timber is classified as hardwood or softwood according to its

- a. Structure
- b. Durability
- c. Workability
- d. Weight

Ques. 5

Cement stored on site must be

- a. Protected from frost
- b. Prevent from bulking
- c. Used within 2 days
- d. Kept dry

Ques. 6

Which of the following timber is most commonly used for floor joist in domestic dwelling?

- a. Mahogany
- b. Pitch pine
- c. Cedar
- d. Oak

Ques. 7

Traditional timber should have a moisture content of approximately 20% in order to

- a. Reduce expansion / contraction to a minimum
- b. Enable ease of cutting and working
- c. Prevent splitting during nailing
- d. Make sure it does not absorb water

Ques. 8

Which of the following defects occurs in timber?

- a. Corrosion
- b. Decay
- c. Waney edge
- d. Cutting

Ques. 9

What is the most common factor that reduces the strength of timber?

- a. Sapwood
- b. Defects
- c. A high cellulose content
- d. Not sufficient acid content

Ques. 10

Which of the following methods would be used for joining copper in a domestic water supply?

- a. Brass union
- b. Capillary fitting
- c. Soldering joints
- d. Brazed joints

Ques. 11

Which one of the following is not part of the anatomy of a tree?

- a. Sapwood
- b. Bark
- c. Heartwood
- d. Spine

Ques. 12

Of the following listed below which is not a method of sawing timber

- a. Through and through sawn
- b. Quarter cut sawn
- c. Pass through sawn
- d. Billet sawn

Ques. 13

Select the correct definition of “hydration”

- a. The general principle of mixing water
- b. The chemical process when the cement absorbs the water
- c. The pliability of the concrete
- d. None of the above/

Ques.14

Common furniture beetle attack on timber can be identified by

- a) A ticking sound
- b) Small holes in the timber
- c) White threads spreading across the surface
- d) Shrinkage between brown flakes

Ques.15

A plasticizer is added to cement mortar when for rendering in order to act as a ?

- a. Filler
- b. Strengthening agent
- c. Damp proof membrane
- d. Wetting agent

Ques.16

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 needed

Ques.17

Which one of the following primers should be used on galvanized steel?

- a. Zinc chromate
- b. Red oxide
- c. Aluminum
- d. White lead

Ques.18

To prevent timber from being destroyed by insect attack it should be

- a. Coated with glass water
- b. Painted with synthetic paints
- c. Pressure impregnated with a starch solution
- d. Pressure impregnated with copper sulphate

Ques.19

Organic impurities in concrete are likely to:

- a. Improve workability
- b. Impair the strength of the concrete
- c. Increase the density of the concrete
- d. Increase the amount of material needed to strengthen the concrete mix

Ques.20

Concrete is described as in-situ if it is

- a. Mixed on the site
- b. Pre-cast and fixed on the site
- c. Cast in final position
- d. Placed in formwork

Ques.21

Concrete test cubes help to determine the strength of concrete in testing

- a. Tensile strength
- b. Compression stresses
- c. Expansion conditions
- d. Impact loading

Ques.22

Heat treatment of iron and zinc powder is known as;

- a. Sand blasting
- b. Annealing
- c. Sulphonating
- d. Sherardizing

Ques.23

What is meant by rough cast?

- a. The wood grained appearance of an in situ concrete wall
- b. A finish coat with a concrete texture
- c. An external rendering undercoat
- d. An exposed aggregate finish

Ques.24

Which of the following is **not** a form of grade testing for timber?

- a. Ball testing
- b. Stress grading
- c. Visual stress grading
- d. Machine stress grading

Ques.25

The strength of a structural concrete made with Ordinary Portland Cement is based on the compressive strength at 28 days. What proportion of the 28 day strength is normally available at 7 days?

- a. 20%
- b. 49%
- c. 100%
- d. 60%

Ques.26

The basic difference between Ordinary Portland cement and rapid hardening cement is that rapid hardening cement:

- a. Hardens much faster
- b. Contains more gypsum
- c. Is grounded more finely
- d. Has a higher lime content

Ques.27

What is meant by the bulking of sand?

- a. Delivery by loads of 3m^3 or more
- b. Increasing the volume by including relatively large grains
- c. Particles held apart by the surface tension of the water in the sand
- d. Sand with 4-6% of silt present

Ques.28

Which one of the following materials would require 'curing' before being used in building?

- a. Clay bricks
- b. Hollow clay bricks
- c. Concrete blocks
- d. Clay quarry tiles

Ques.29.

One of the considerations in the formula for the minimum reinforcement cover is?

- a. Concrete and reinforcement must be exposed
- b. Diameter should be approximately 100mm
- c. Compression stresses of material is 50%
- d. It should be twice the diameter of the bar and at least 25mm

Ques.30.

What types of soils are poor for building on?

- a. Loam, clay sand and rock
- b. Rock, Gravel, Loose loam
- c. Sand, Clay, Silt
- d. All of the above.

Ques.31.

Multiple bonding of carbon is found in the molecular structure of?

- a. Cement
- b. Steel
- c. Glass
- d. Plastic

Ques. 32.

From the list below indicate which are hardwoods?

Types of Woods			
a	b	c	d
Cedar	Red Alder	King Wood	Copper
Maple	Black Ash	Hickory	Pitch Pine
Red Pine	Brazilian Walnut	Cypress	Bronze
Red Spruce	Mahogany	Fir	Sweet Birch

Ques.33.

Which one of the following factors does not affect the strength of hardened concrete?

- a. Water-cement ratio
- b. Compaction
- c. Aggregate cement ratio
- d. Volume of concrete

Ques.34.

The term 'weathering' when applied to a timber window sill refers to the?

- a. Capillary grooves
- b. Drip throating
- c. Splay on the upper surface
- d. Water bar

Ques.35.

Which one of the following sketches shows a normal cube failure?

