UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCE

MAIN EXAMINATION PAPER DEC 2019

TITLE OF PAPER : BUILDING CONSTRUCTION TECHNOLOGY I

COURSE CODE : EHS 203

DURATION : 2 HOURS

MARKS : 100

INSTRUCTIONS : ANSWER ANY FOUR QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

: BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR

QUESTION ONE

a) Taking the example of metal as a building material explain in detail the LCA concept [9]

b) In construction there is often talk about climatic design. Discuss problems caused by each of the following climatic elements in a building:

   i. temperature [3]

   ii. wind [3]

   iii. precipitation [3]

c) In a few words explain the notion of "buildings as environmental envelope" [7]

QUESTION TWO

a) Describe the following basic methods of construction : [14]

   i. Solid construction

   ii. Framed or skeletal construction

   iii. Panel or boxed construction

   iv. Folded plate construction

   v. Insitu

   vi. Prefabrication

   vii. Applied methods of construction

b) Outline briefly the meaning of following properties of concrete:

   I. Settlement and bleeding **[2]**

   II. workability **[2]**

   III. Plastic shrinkage **[2]**

c) Recently Eswatini experienced severe draught. To mitigate this natural disaster the government has embarked on a number of dam construction projects. What are the possible environmental impacts of such projects? [5]

QUESTION THREE

a) Draw sketches to depict the following in brickwork terminology;

   i. Toothing [2]

   ii. Quoin [2]

   iii. Perpends [2]

iv. Lap [2]

b) All materials generally have construction failures. Briefly outline the construction failures of the following building materials:

i. timber [2]
ii. cement [2]
iii. metal [2]
iv. paint [2]

c) Giving examples of relevant building elements outline the type of uses that may be serviced by the following concrete strengths

i. 5MPa to15MPa [3]
ii. 20MPa to 40MPa [3]
iii. 50MPa and above [3]

QUESTION FOUR

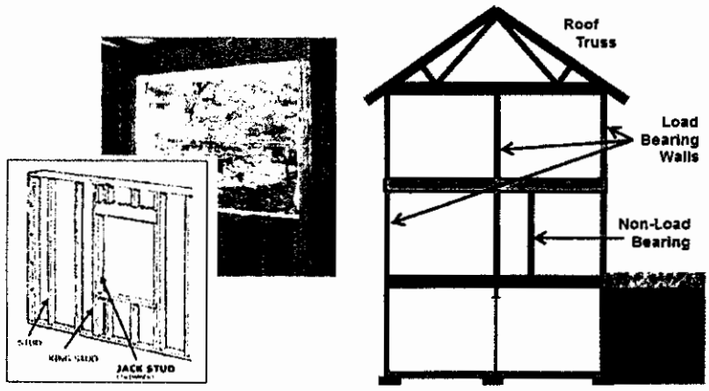
(a) Identify the bonds for the description given below:

i. This bond is used above doors and window openings. Bricks are placed with the headers facing the outside. **[3]**

ii. Bricks are placed with their longest side facing the outside of a wall. This bond is used for the main wall section **[3]**

iii. This bond consist of alternate course of headers and stretchers **[3]**

(b) Below you will find an example of Load bearing walls and non-load bearing walls.



i. What is the difference between the two [2]

ii. Where in a structure would you use a non-load bearing wall? **[2]**

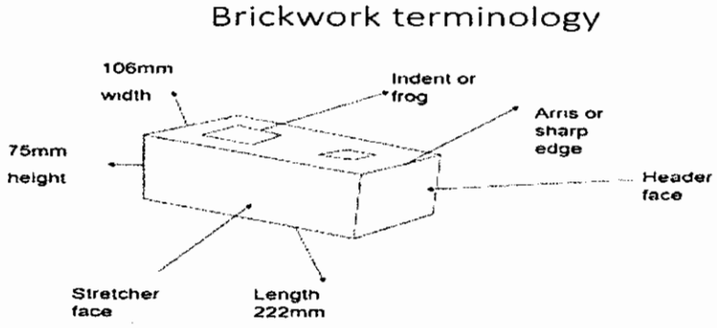
iii. What structural elements compensate for the removal of a load bearing wall? **[2]**

(c) Concerning Suspended Ceilings:

i. Name the three common types of suspended ceilings [3]

ii. Discuss three advantages of using suspended ceilings [3]

(d) Given that a brick has the following dimension.

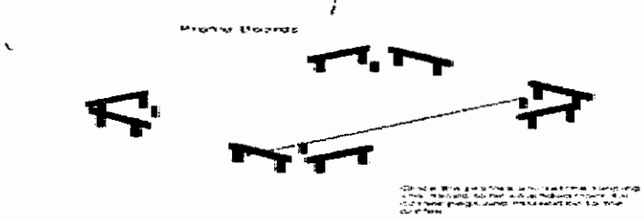


i. What is the size of a mortar joint? **[1]**

ii. What is the link between the mortar joint and brick bonding **[3]**

QUESTION FIVE

a) The following is a sketch of a profile board. State five uses of a profile board. **[5]**



b) Concerning roofs

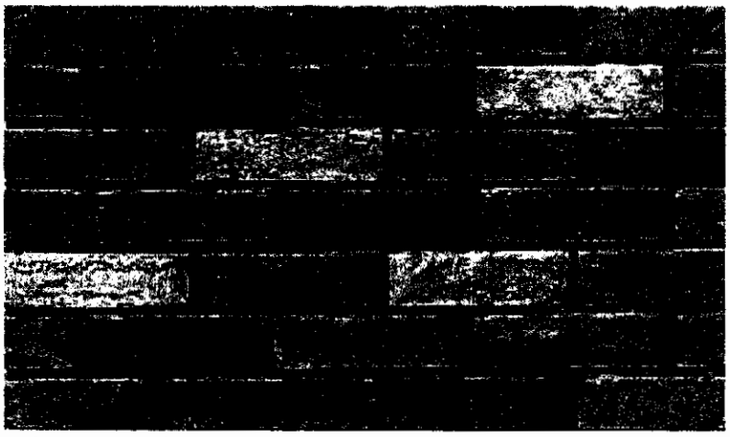
i. Distinguish between short, medium and long span roof structures **[3]**

ii. Outline five functions of a roof **[5]**

c) Explain the relevance of environmental considerations in the construction industry **[5]**

d) State the three classes of floor finishes. **[3]**

e) The picture following points to a burnt clay bricks.



i. State the three advantages of burnt clay bricks as a building material **[3]**

ii. Explain the type of bond being used here **[1]**