JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DEGREE IN SCIENCE IN RENEWABLE ENERGY TECHNOLOGY AND MANAGEMENT

2ND YEAR 1ST SEMESTER UNIVERSITY EXAMINATIONS 2021-2022 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

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COURSE CODE: TCB 1207

COURSE TITLE: BUILDING SCIENCE

EXAM VENUE: **STREAM: B.Sc IN CONSTRUCTION MANAGEMENT**

DATE: **EXAM SESSION: December 2021**

DURATION: 2HOURS

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Instructions

1. **Answer question 1 (compulsory) and ANY other two questions**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand their answer booklets to the invigilator while in the examination room**

QUESTION 1 (30 Marks) Compulsory

1(a) Define the term daylight factor. (2 Marks)
(b) State and explain the four main categories of heat insulating products (4 Marks)
(c). Briefly describe the five factor that light quantity depends upon. (10 Marks)
(d) Describe three ways of insulating structure borne sound (6 Marks)
(e). State and explain four conditions of a good acoustic for an auditorium (8 Marks)

QUESTION 2

a) Calculate the total heat energy required to completely convert 2 kg of ice at 0^{o}**C** to steam at 100^{o}**C**. The specific heat capacity of water is 4190 J/kg ^{0}C. The specific latent heats are 335kJ/kg for ice and 2260 kJ/kg for steam (4 Marks)
b) Outline six (6) factors that heat gained in a building by radiation from the Sun depends upon (6 Marks)
c) Sun controls are parts of a building that help prevent excessive heat gain and glare caused by direct sunshine. Describe the main type of devices. (10 Marks)

QUESTION 3

a) Outline the three main functions of artificial lighting (6 Marks)
b) Briefly describe five factors may be relevant to the design of a particular lighting System (10 Marks)
c) State four factors that govern quantity of natural light inside a room (4 Marks)

QUESTION 4

a) The natural illuminance at a point inside a room is 430 lx and the illuminance given by an unobstructed sky is assumed to be 5380 lx. Calculate the daylight factor at that point. (5marks)
b) Many of the reasons for not wanting a particular sound can be identified by the effects that it can have on the listener or on the environment. Some of these effects (15marks)

QUESTION 5

a) Calculate the total sound level caused by the combination of sound levels of 95 dB and 90 dB. Threshold of hearing intensity= 1 x 1 0^{-12} W/m^2 (6 Marks)
b) State and explain four classification of sound absorbing materials based on mode of their performance (8 Marks)
c) By use of a sketch, describe three components of daylight factor (6 Marks)