

AR117 - Building Science

Date: Thursday 6th June, 2022
Time: 8.20am
Room: Architecture Studio 1
Duration: 3 hours

Instruction to Candidates:

- 1.0 You have 10 minutes to read the paper.
You must not begin writing during this time.
- 2.0 All answers must be written on the answer book(s) provided
- 3.0 Print your name and student identification number on the answer book(s) provided. Do it now.
- 4.0 No reference material is allowed in the examination room.
- 5.0 No mobile phones allowed in the Examination Room. Alternatively, switch off and put in your bag and leave at the front of the room.
- 6.0 Attempt All Questions

Question No.1 (2 marks)

Man builds for many reasons, however, there are two (2) critical reasons why he has to build. Identify and briefly describe these two reasons.

Question No.2 (2 marks)

Thermal comfort is an important consideration in building design and construction. Explain.

Question No.3 (12 marks)

Provide correct equations for:

- (a) Conduction heat flow rate, Q_c (4 marks)
- (b) Ventilation heat flow rate. Q_v (4 marks)
- (c) Solar radiation through glass window, Q_s (4 marks)

Question No.4 (2 marks)

Explain the main building design objectives for these situations:

- (a) Heat loss situation
- (b) Heat gain situation

Question No.5 (3 marks)

The process of *seeing and understanding* involves three things. Describe these 3 things.

Question No.6 (3 marks)

Activities and functions in rooms do not require the same required working plane illuminances. Explain

Question No.7 (4 marks)

Natural daylight and artificial lighting have their advantages and disadvantages. Highlight these advantages and disadvantages.

Question No.8 (5 marks)

Good lighting in the workplace promotes five (5) things. List these 5 things

Question No.9 (4 marks)

In room acoustics, speech intelligibility is dependent on clarity and sound power. Explain what affects clarity and sound power.

Question No.10 (3 marks)

The Utilisation Factor (UF) is a variable given in the Lumen Method. Why is it an important variable?

Question No.11 (4 marks)

Explain how air-borne noise and structure-borne noise can be addressed.

Question No.12 (2 marks)

In order to address a noise problem, we can consider three (3) elements: *the source, the path, and the receiver*.

One of the elements listed above is considered the most effective in addressing a noise problem. Identify this element and state why this is so.