

## **AR117 - Building Science**

Date: Wednesday 9<sup>th</sup> June, 2021  
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)**

Why does man build? Explain

**Question No.2 (17 marks)**

- (a) Define thermal comfort (2 marks)
- (b) List the thermal comfort factors (15 marks)

**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 ( 3 marks)**

The process of **seeing** includes three things. Describe these 3 things

**Question No.5 ( 3 marks)**

Different functions require different working illuminances. Explain

**Question No.6 (4 marks)**

Identify the two main sources of light, outlining their advantages and disadvantages.

**Question No.7 ( 5 marks)**

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

**Question No.8 ( 2 marks)**

In room acoustics, speech intelligibility is dependent on two main factors. Identify and briefly describe these factors.

**Question No.9 ( 3 marks)**

The Utilisation Factor (UF) is a variable given in the Lumen Method. The UF is dependent on three factors. Identify and briefly describe these factors.

**Question No.10 ( 3 marks)**

List three (3) strategies that can be used to address external noise control problems.

**Question No.11 (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.