

# KIBABII UNIVERSITY

2017/2018 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER

MAIN EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN RENEWABLE ENERGY AND  
BIOFUELS TECHNOLOGY

**COURSE CODE: IET 425**

**COURSE TITLE: Energy Auditing**

**DATE: 6/8/2018**

**TIME: 9-11AM**

## INSTRUCTIONS TO CANDIDATES

Answer question ONE and any other two questions

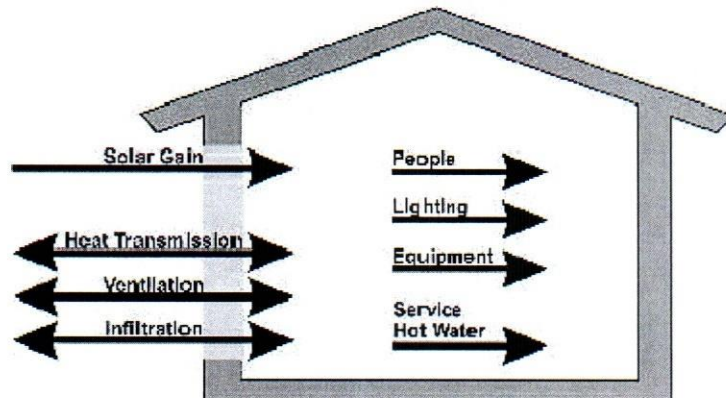
This paper consists of 4 printed pages. Please Turn over

### Question One

- (a) Explain the following terms as applied to energy management
- (i) Energy conservation **4 marks**
  - (ii) Energy audit **4 marks**
  - (iii) Energy policy **3 marks**
  - (iv) Energy intensity **3 marks**
- (b) State the instruments used for audit of electrical parameters **4 marks**
- (c) State the factors to be considered before procuring fuels for energy efficiency and economics **3 marks**
- (d) State the objective of energy management **3 marks**
- (e) State the important technical feasibility parameters that one should consider during analysis of energy conservation opportunities **6 marks**

### Question Two

- (a) State the steps involved in 'Energy management Strategy' **8 marks**
- (b) The figure below is a depiction of typical thermal loads in a room or building. Explain the features of thermal loads indicated. **12 marks**



### Question Three

- An energy auditor or an energy manager is trying to establish the power factor of a 7.5 HP induction motor. The instrument to measure electric parameters displays the three numbers 2.5 kW and 1 kVAr and PF = 92.9%.
- (a) **15 marks**  
Do you fully agree with the instrument display and its correctness?
- (b) Define the following terms related to lighting
- (i) Luminous Intensity **1 marks**
  - (ii) Luminous Flux **1 marks**
  - (iii) Illuminance (illumination) **1 marks**
  - (iv) Luminous Exitance **1 marks**
  - (v) Luminance (brightness) **1 marks**

### Question Four

- (a) List steps involved in 'detailed energy audit'. **14 marks**
- (b) Energy conservation and energy efficiency are separate, but related concepts. Justify the above statement in brief **6 marks**

### Question Five

- (a) Give a typical energy audit reporting format. **15 marks**
- (b) State any five components of the electricity bill charged to the industrial consumers by a electric supply company. **5 marks**