



ELIZADE UNIVERSITY, ILARA-MOKIN, ONDO STATE
FACULTY OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

FIRST SEMESTER EXAMINATION, 2017/2018 ACADEMIC SESSION

COURSE TITLE: RENEWABLE ENERGY

COURSE CODE: EEE 425

EXAMINATION DATE: 19TH MARCH, 2018

COURSE LECTURER: DR. O. M. Longe

A handwritten signature in black ink, enclosed within a rectangular box. The signature is stylized and appears to be 'O. M. Longe'.

HOD's SIGNATURE

TIME ALLOWED: 2 HOURS

INSTRUCTIONS

1. ATTEMPT ANY FOUR QUESTIONS ONLY.
2. ALL QUESTIONS CARRY EQUAL MARK.
3. SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAM.
4. YOU ARE NOT ALLOWED TO BORROW CALCULATORS AND ANY OTHER WRITING MATERIALS DURING THE EXAMINATION.

QUESTION ONE

- a. Mention two renewable and non-renewable energy sources. [4 mks]
- b. Describe a stand-alone microgrid with the aid of diagram. [5 mks]
- c. State the global warming effect (%) of the following greenhouse gases:
 - i. Carbondioxide
 - ii. Methane
 - iii. Ozone [3 mks]
- d. Mention one renewable energy resources found in the following regions of Nigeria:
 - i. North-East
 - ii. South-West
 - iii. South-South [3 mks]

QUESTION TWO

- a. With the aid of diagram describe a parabolic trough plant. [10 mks]
- b. Give three examples of solar collectors. [3 mks]
- c. Mention two advantages of solar thermal energy. [2 mks]

QUESTION THREE

- a. With the aid of diagram describe the principle of operation of a wind turbine. [8 mks]
- b. Use diagram to illustrate Horizontal axis wind turbine [4 mks]
- c. Explain any one environmental impact of wind energy. [3 mks]

QUESTION FOUR

- a. Explain the following methods by which biomass is converted to electricity:
 - i. Burning
 - ii. Decomposition [6 mks]
- b. Explain two environmental impacts of biomass energy. [6 mks]
- c. Mention three advantages of biomass energy. [3 mks]

QUESTION FIVE

- a. Briefly explain hydroelectric power generation. [5 mks]
- b. Explain two environmental impacts of hydroelectric power. [6 mks]
- d. Define the following:
 - i. Biofuel
 - ii. Bioelectricity [4 mks]

QUESTION SIX

- a. Give two similarities and dissimilarities between renewable and non-renewable energy sources? [4 mks]
- b. Explain two environmental impacts of solar energy. [6 mks]
- c. Mention any four components of a photovoltaic system. [4 mks]
- d. Mention one open-source software that can be used to model hybrid renewable sources. [1 mk]