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# KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS  
2020/2021 ACADEMIC YEAR

FOURTH YEAR FIRST SEMESTER  
MAIN EXAMINATIONS

FOR THE DEGREE OF BSC (RENEWABLE ENERGY AND BIOFUEL  
SYSTEMS)

**COURSE CODE:** *IET 421*

**COURSE TITLE:** *NETWORKING ENGINEERING, MODELLING AND  
MANAGEMENT*

**DURATION:** 2 HOURS

**DATE:** 21/07/2021

**TIME:** 2:00-4:00PM

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## INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of 4 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

### *QUESTION ONE*

- a) Briefly explain net metering. (5mks)
- b) Explain the contractual issues for grid connected system. (5mks)
- c) Briefly explain what is meant by an electric grid (2mks)
- d) What determines the choice of conductors in transmission networks? (4mks)
- e) Differentiate between the two protective devices in electrical transmission system. (4mks)
- f) Briefly explain how renewable energy projects can be connected to electricity distribution grids and state its benefits to the country. (5mks)
- g) State the economic factors which affect the energy transmission and distribution networks. (5mks)

### *QUESTION TWO*

- a) What is meant by an electric grid (2mks)
- b) Explain what is meant by an electrical power system (2mks)
- c) List and explain any three components of electrical power transmission. (6mks)
- d) Explain the two methods of electrical wiring systems (6mks)
- e) Explain the following terms as applied to electrical distribution systems. (4mks)
  - i) Electrical switchboards
  - ii) Distribution boards
  - iii) Circuit breakers and disconnectors
  - iv) Transformers

### *QUESTION THREE*

- a) Explain the shortcomings and limitations to the existing sources energy. (6mks)
- b) Explain the role of distributed generations in local and national energy supply. (8mks)
- c) What are the advantages of distributed energy resources. (6mks)

### *QUESTION FOUR*

- a) State and explain the requirements you may need to transmit electricity loads safely to comply with power providers rules and regulations. (6mks)
- b) What are the components you may need in balance off system. (6mks)
- c) Explain the importance of balance off system in electric power distribution. (8mks)

### *QUESTION FIVE*

- a) Briefly explain the non-conventional sources of energy (5mks)
- b) Explain briefly why electric power is transmitted in high voltages and state the advantages and limitations of high voltage transmission. (10mks)
- c) State the economic factors that affect the design and distribution of electricity. (5mks)