



**JARAMOGI OGINGA ODONGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS FOR THE DEGREE IN SCIENCE IN RENEWABLE  
ENERGY TECHNOLOGY AND MANAGENT**

**3<sup>RD</sup> YEAR 1<sup>ST</sup> SEMESTER 2018/2019 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: TET 3315**

**COURSE TITLE: FOSSIL FUEL POWER PLANT TECHNOLOGY**

**EXAM VENUE: STREAM: BSc REN ENERGY TECH & MGT**

**DATE: ../12/2018 EXAM SESSION:**

**DURATION: 2 HOURS**

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### **Instructions**

- 1. Answer question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

#### QUESTION ONE

- a) 1 a) Briefly define what is fossil fuel (3mks)
- b) Outline some of the main types of fossil fuel power technologies available around the world (6mks)
- c) Using illustration, explain the how fossil fuel was formed (6mks)
- d) Coal based power plant is the most widely used and cheapest fossil fuel technology in the world. Highlight some of its advantages and disadvantages (7mks)
- e) What are the main important factors one should assess/evaluate before setting up a fossil fuel based power plant project (8mks)

#### QUESTION TWO

- a) Using illustration, define what is combined heat and power (3mks)
- b) As an upcoming renewable energy expert, what are some of the features you would assess to ascertain that a diesel power plant project is compliant with environment and energy conservation standards (8mks)
- c) Discuss the main components of a typical diesel power plant (9mks)

#### QUESTION THREE

- a) Using a diagram, explain how a typical combined gas and steam turbine system generates electricity (6mks)
- b) What are the advantages and disadvantages of combined gas and steam turbine system (7mks)
- c) As an upcoming Energy expert what are some of policies you would recommend to both national and private sector to formulate in order to stimulate more investment in combined heat and power systems (7mks)

#### QUESTION FOUR

- a) Differentiate between renewable and non-renewable energy sources (4mks)
- b) Most government globally are increasingly embracing alternative forms of energy while reducing dependency on fossil fuel. Describe in detail some of the alternative energy being embraced (8mks)
- c) What are some of the environmental impacts posed by diesel, natural gas and coal based power plants (8mks)

#### QUESTION FIVE

- a) Briefly define what is Occupational Health and Safety (3mks)
- b) You have been selected as a project manager for a diesel power plant project. Discuss some of the occupational health and safety measures you would formulate and enforce to avoid occupational hazards (9mks)
- c) Information/ data on commercial viability of any power plant project is crucial for most investors during decision making. What are the main economic tools used to assess the commercial viability of a power plant project (8mks)