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

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE**

**RENEWABLE ENERGY TECHNOLOGY AND MANAGEMENT**

**SUPPLIMENTARY EXAM ACADEMIC YEAR 2015/2016**

**MAIN CAMPUS**

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**COURSE CODE: TET 3317**

**COURSE TITLE: INNOVATION AND DESIGN**

**EXAM VENUE: LAB 1** **STREAM: (BSc. Renewable Energy Tech & Mngt.)**

**DATE: 05/05/2016** **EXAM SESSION: 11.30 – 1.30 PM**

**TIME: 2.00 HOURS**

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**Instructions:**

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

**Question One (Compulsory)**

a) Outline any three things a supervisor will look at to justify that an idea is innovative. . (3 marks)

b) Outline Four features of a good engineering design. (4 marks)

c) Discuss five steps that are followed when carrying out scientific design. (5 marks)

d) According to many researchers it is important to understand the world around us to be successful in design and innovations discuss two approaches that are helpful in understanding the world around us. (4 marks)

e) Discuss three ways how prototypes will differ with the final product. (6 marks)

f) Outline four areas under which research can be undertaken when carrying design. (4 marks)

g) Outline four consequences of design obsolescence of a product. (4 marks)

**QUESTION TWO**

a) Safaricom is planning to launch a new product in the market. Discuss the steps and use an illustration to show the steps that Safaricom will follow during the prototyping of the new product. (12 marks)

b) Discuss the steps followed on product design. (8 marks)

**QUESTION THREE**

a) Kenya needs to support ant protect innovation to achieve vision 2030. Discuss any five legal and regulatory frameworks that the government needs to implement to achieve that goal. . (10 Marks)

b) Discuss any five types of design obsolescence that a designer should be conversant with and give an example for each. (10 marks)

**QUESTION FOUR**

a) Briefly discuss any five of the constraints that you would consider in the design process. (5 marks)

b) Discuss the engineering design process. (11 marks)

c) Discuss two types of knowledge that is crucial to accomplish product design cycle (4 marks)

**QUESTION FIVE**

a) Discuss any six factors that affect design. (12 marks)

b) Outline any four reasons why almost all manufacturing industries have opted to invest in prototypes. (4 marks)

c) Using an illustration discuss the product life cycle. (4 marks)