



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF SPATIAL PLANNING**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE**  
**IN WATER RESOURCES AND ENVIRONMENTAL MANAGEMENT**  
**SEMESTER 2018/2019 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: PES 3323**

**COURSE TITLE: SCIENTIFIC AND ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL MANAGEMENT**

**EXAM VENUE:**

**STREAM: WATER**

**DATE: 26/4/19**

**EXAM SESSION: 3.00 – 5.00PM**

**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer question 1 (compulsory) 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

- a) Explain five reasons why environmental assessment at policy level is important (10 marks)
- i. Increases the level of scrutiny of environmental and social concerns (i.e., to a comparable level as economic, technological, and financial considerations)
  - ii. Provides an opportunity to proactively guide development in ways that are sustainable (e.g., incorporate sustainability considerations into upper levels of decision making, increases opportunities to affect projects)
  - iii. Provides an opportunity for genuine consideration of a broad range of alternatives which are often ignored or not feasible in project EIA (e.g., sites, technology, lifestyle choices, resource use)
  - iv. Improved analysis of cumulative, large-scale (i.e., regional, national and global), and non-project impacts (e.g., agricultural practices)
  - v. Encourages consideration of environmental objectives within all government agencies (i.e., not just environmental departments)
  - vi. Facilitates and increases consultation between different government agencies
  - vii. Provides an opportunity to identify views of the public
  - viii. Strengthens project-level EIA (i.e., limitations are due primarily to the relative late stage in decision making at which EIA takes place when only limited consideration can be given to the need of the project and alternative possibilities, or to the cumulative effects of related actions)
  - ix. Enhances efficiency via tiering (i.e., makes project specific EIA more efficient)
- b) Give five barriers to effective implementation of environmental management systems (10 marks)
- i. Lack of management support and commitment
  - ii. Inadequate resources
  - iii. Lack of support from staff
  - iv. Inadequate awareness and culture within the organisation
  - v. Lack of clear responsibilities and authorities
  - vi. EMS too complex for the organisation
  - vii. Organisational
- c) Explain the 5 types of environmental audits (10 marks)

## Question two

- a) Give five reasons why an environmental management system is important (10 marks)
- i. Improve management of environmental impacts
  - ii. Set targets to reduce energy use, water use & waste to landfill – improve efficiency in general
  - iii. Define key responsibilities for achieving targets
  - iv. Monitor and measure environmental performance against key indicators
  - v. Ensure due diligence and on-going consideration of legal and other environmental requirements
  - vi. Assist with environmental reporting
  - vii. Contribute to preferred employer status
  - viii. Achieve cost savings

- ix. Show leadership, nationally and/or internationally
  - x. Obtain competitive advantage over competitors
  - xi. May be required by clients, customers and/or regulators – legal requirement
- b) Discuss document control in environmental management system (10 marks)
- i. Document approval
  - ii. Document review, update and re-approval
  - iii. Identification of changes and current revision status
  - iv. Availability at points of use
  - v. Legibility and identification
  - vi. Identification and distribution of external documents
  - vii. Management of obsolete documents

### Question three

- a) Discuss your understanding of Product Life Cycle Assessment (4 marks)
- b) Explain the three basic inputs into a life cycle of a product (6 marks)
- i. Energy
  - ii. Materials
  - iii. Labour
- c) Explain five indicators that will help you know if a product is eco-friendly (10 marks)
- i. If it is made of recycled materials
  - ii. If it is of greater energy efficiency than its counterparts
  - iii. It is made of biodegradable ingredients
  - iv. It is ozone friendly
  - v. If it is recyclable

### Question four

- a) Discuss the two principles of payment for ecosystem services (6 marks)
- Those who provide environmental services get paid for doing so ('provider gets')
  - Those who benefit from environmental services pay for their provision ('user pays')
- b) Describe the following components of a payment for ecosystem services
- i. Supervision mechanism (8 marks)
  - ii. Financing mechanism (3 marks)
  - iii. Payment mechanism (3 marks)

### Question five

- a) Discuss any two direct ecosystem services valuation methods (10 marks)
- b) Discuss any two indirect ecosystem services valuation methods (10 marks)