



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL OF SPATIAL PLANNING  
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN  
WATER RESOURCE AND ENVIRONMENTAL MANAGEMENT  
SEMESTER 2016/2017 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: PWE 3321**

**COURSE TITLE: SOIL AND WATER CONSERVATION MANAGEMENT**

**EXAM VENUE:**

**STREAM: SPATIAL PLANNING**

**DATE:**

**EXAM SESSION:**

**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) Discuss the following types of soils in Kenya and state where they occur
  - i. Nitisols. (5 marks)
  - ii. Vertisols. (5 marks)
- (b) Discuss the predominant types of soils in semi-arid regions (Northern and North-Eastern Kenya). (5 marks)
- (c) Discuss the overview of Kenya precipitation patterns. (5 marks)
- (d) Discuss the overview of Kenya landscapes. (10 marks)

### QUESTION TWO

- (a) Discuss the following factors affecting erosion by water:
  - i. Climatic factors. (5 marks)
  - ii. Soil properties. (5 marks)
- (b) Explain the mechanics of raindrop erosion. (4 marks)
- (c) Explain the following forms of water erosion:
  - i. Sheet erosion including an equation for determining energy of sheet erosion. (3 marks)
  - ii. Rill erosion. (3 marks)

### QUESTION THREE

- (a) Discuss factors affecting wind erosion. (10 marks)
- (b) Discuss the control of wind erosion on grazing lands. (5 marks)
- (c) Discuss the development processes of gully erosion. (5 marks)

### QUESTION FOUR

- (a) Discuss control of deep and narrow gullies. (5 marks)
- (b) Discuss agronomic soil conservation measures. (5 marks)
- (c) Discuss soil conservation strategies for ecosystem approach. (5 marks)

### QUESTION FIVE

- (a) Discuss the objectives of watershed management. (5 marks)
- (b) Discuss various types of drainage systems. (5 marks)
- (c) Discuss design considerations of siltation ponds. (6 marks)
- (d) Describe a method for measuring soil erosion in a small size runoff plot test. (3 marks)