



**THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE**

***Faculty of Engineering & Technology***

**DEPARTMENT OF CIVIL AND BUILDING ENGINEERING**

**HIGHER DIPLOMA IN BUILDING AND CIVIL ENGINEERING  
(HD 2010)**

**SEMESTER EXAMINATIONS**

**APRIL/MAY 2010 SERIES**

**HIGHWAYS**

**TIME: 2 HOURS**

**Instructions to Candidates:**

This paper consists of **FOUR** questions.

Attempt Question **ONE** and any Other **TWO** Questions

### **Question ONE**

- (a). Briefly describe the two categories of traffic flow. **(4 Marks)**
- (b). Using mathematical expressions, describe the following terms;
- (i). Space mean speed,
  - (ii). Time mean speed,
  - (iii). Lane occupancy **(6 Marks)**
- (c). A vehicle travelling at a speed of 120kph notices a stationary vehicle ahead at a distance of 150m. Assuming a deceleration rate of  $4\text{m/s}^2$ , will the vehicle in time to avoid an accidents? **(12 Marks)**

### **Question TWO**

- (a). Name the **FOUR** basic types of bridges. **(4 Marks)**
- (b). State the **SIX** traffic flow characteristics. **(6 Marks)**
- (c). Briefly describe the negative socio-economic implications of the Likoni ferry crossing transportation problems to an Mombasa Polytechnic University College day scholar who resides in Likoni. Suggest some solutions to the problem. **(14 Marks)**

### **Question THREE**

- (a). State the **THREE** factors that influence safety on the road and briefly describe their interrelationship. **(6 Marks)**
- (b). Define the following acronyms:
- (i). ADT
  - (ii). DHV
  - (iii). AASHTO
  - (iv). LOS
- (c). Briefly describe the procedure for determining the culvert size for the drainage of a road section. **(10 Marks)**

### **Question FOUR**

- (a). State the **SIX** major controls governing the geometric design of a highway. **(12 Marks)**
- (b). Sketch and describe 6 road safety signs commonly used on Kenyan roads. **(12 Marks)**