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**University Examinations 2015/2016**

THIRD YEAR FIRST SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL ENGINEERING

**ECV 2304: HIGHWAY ENGINEERING I**

**DATE: NOVEMBER 2015 TIME: 11/2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions.*

*Use scientific non-programmable calculator.*

*Show all working on provided script.*

*Mobile phones are not allowed in the examination room.*

**QUESTION ONE (30 MARKS)**

1. Briefly explain the term highway engineering. (4 Marks)
2. State any five factors which would be considered in highway design. (5 Marks)
3. Describe the process for building a road embankment before the pavement is laid on it. (10 Marks)
4. State any five materials which can be used in construction of a road base. (5 Marks)
5. Briefly describe how roads are constructed to facilitate proper drainage on their surface. (6 Marks)

**QUESTION TWO (15 MARKS)**

1. Outline the term “depreciation” as it refers to construction equipment. (2 Marks)
2. A piece of construction equipment cost Kshs.1,224,000 and it can be usefully utilized for four years. The estimated salvage value of the equipment is Kshs.204,000. Calculate the depreciation and the book value of this equipment for each of the four years using the straight line depreciation method. (8 Marks)
3. Distinguish between resource leveling and resource allocation. (5 Marks)

**QUESTION THREE (15 MARKS)**

1. Explain how the aggregate crushing value test is carried out in the laboratory. (5 Marks)
2. Describe the following shapes of aggregate:-
3. Angular
4. Flaky
5. Elongated. (6 Marks)
6. Discuss the characteristics of good aggregates. (4 Marks)

**QUESTION FOUR (15 MARKS)**

1. Discuss the nuclear determination of moisture-density of compacted soil. (7 Marks)
2. Explain how the Califonia bearing ratio test is calculated out in the laboratory applying the static compaction method in preparation of the specimens. (8 Marks)