MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.
Tel: 020-2069349, 061-2309217. 064-30320 Cell phone: +254 712524293, +254 789151411
Fax: 064-30321
Website: www.must.ac.ke Email: info@must.ac.ke

University Examinations 2013/2014

THIRD YEAR, SECOND SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL ENGINEERING

ECV 0253: HIGHWAY ENGINEERING II

DATE: APRIL 2014 **TIME: 1 ½ HOURS**

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

QUESTION ONE – (30 MARKS)

(a) How are CBR values utilized in new road construction? Describe any three methods used in carrying out CBR test. (3 Marks)

(b) Briefly describe the following materials as used in road construction:

(i) Dense bitumen macadam (DBM) (1 Mark)

(ii) Prime coat (1 Mark)

(iii) Tack coat (1 Mark)

(iv) Graded crushed stones (1 Mark)

(c) Name four types of traverse joints and their uses in rigid pavement construction. (4 Marks)

(d) Describe two ways in which bitumen can be used as a stabilizing agent in road construction. (2 Marks)

(e) Mention any four factors you would consider in choosing the premix surfacing type. (2 Marks)

(f) Explain the term 'plastic' and 'liquid' limit states of a soil. (2 Marks)

(g) State any four benefits that can be realized from recycling bituminous pavements. (2 Marks)

(h) State four uses of lime when used in stabilizing road construction materials. (2 Marks)

(i) Using a schematic flow chart, describe the process of bitumen manufacturing. (6 Marks)

(j) Distinguish between fire and flash points as used in bitumen quality control. What is their significance in road construction? (3 Marks)

QUESTION TWO– (15 MARKS)

(a) Describe the following types of bitumen in road construction:
  (i) Straight run bitumen (2 Marks)
  (ii) Cut-back bitumen (2 Marks)
  (iii) Bitumen emulsions (2 Marks)
(b) State any other four alternative uses of bitumen. (2 Marks)
(c) State any three properties desirable of a bituminous mix. (4 Marks)
(d) What constitutes a bituminous mix? (3 Marks)

QUESTION THREE - (15 MAKS)

(a) What are the objectives in carrying out design mix of a bituminous mix? (6 Marks)
(b) Name and describe any one method used in performing design mix of a bituminous mix. (9 Marks)

QUESTION FOUR – (15 MARKS)

(a) Explain five benefits derived in recycling bituminous pavement. (5 Marks)
(b) Describe any five methods used in recycling bituminous mixes. (5 Marks)
(c) Describe any five aggregates properties desirable in the production of a bituminous mix. (5 Marks)