EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION
(MINISTRY OF HIGHER EDUCATION)

CIVIL ENGINEERING DEPARTMENT

FINAL EXAMINATION

CC302 : HIGHWAY ENGINEERING

DATE : 24 NOVEMBER 2012
DURATION : 2 HOURS (8.30 AM – 10.30 AM)

This paper consists of FIVE (5) pages including the front page.
Section A: Subjective (10 questions – answer all questions)
Section B: Essay (4 questions – answer only 3 questions)

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(The CLO stated is for reference only)
SECTION A

SUBJECTIVE (40 marks)

INSTRUCTION:

This section consists of TEN (10) questions. Answer ALL questions.

QUESTION 1

State FOUR (4) road categories in Malaysia. [CLO1: C1] (4 marks)

QUESTION 2

Draw and label the road structure proposed by Thomas Telford. [CLO1:C4] (4 marks)

QUESTION 3

State TWO (2) materials used as binder in pavement. [CLO3:C1] (2 marks)

QUESTION 4

List SIX (6) tests conducted on pavement materials. [CLO3:C1] (6 marks)

QUESTION 5

State THREE (3) factors which may affect the strength of the road pavement. [CLO1:C1] (3 marks)
QUESTION 6
Give example of FIVE (5) types of road surface drainage system. [CLO1:C1]

(5 marks)

QUESTION 7
Describe the traffic control device requirement. [CLO2:C2]

(4 marks)

QUESTION 8
The two most widely used materials are conventional paints and hot-applied thermoplastics (including spray-plastics). Between 80-90 per cent of the road-lines laid in Malaysia are thermoplastic, whereas on Continent the reverse is generally true. List out TWO (2) advantages of conventional paints and hot-applied thermoplastics. [CLO2:C4]

(4 marks)

QUESTION 9
The road maintenance operation is specifically planned according to restorative and preventive methods. Classify FOUR (4) categories of road maintenance in Malaysia. [CLO1:C4]

(4 marks)

QUESTION 10
There are several road failures. List FOUR (4) types of road failures. [CLO1:C1]
SECTION B

ESSAY QUESTIONS (60 marks)

INSTRUCTION:

This section consists of FOUR (4) subjective questions. Answer THREE (3) questions only.

QUESTION 1

a) Based on BS5930:1981 (Code of Practice For Site Investigation), explain TWO (2) objectives of site investigation. [CLO 1:C4]

(4 marks)

b) State THREE (3) methods of soil stabilization and give an example for each method. [CLO 1:C1]

(6 marks)

c) Ground work is one of the operations in the pre-construction of roads. Explain in detail the purposes and the activities in ground work operation. [CLO 1:C4]

(10 marks)

QUESTION 2

a) Determine the types of materials used in flexible pavement road surface. [CLO2:C4]

(5 marks)

b) Explain the construction of wearing course and base course in road pavement construction. [ CLO2:C4 ]

(15 marks)
QUESTION 3

Concrete pavement also known as rigid pavement has used TWO (2) techniques of paving for base and sub-base layer. These techniques are known as Fixed Form Paver and Slip Form Paver. Explain FOUR (4) differences between the two types of paving techniques.  [CLO2:C4]

(20 marks)

QUESTION 4

A road with hierarchy of 05 has a surface width of 7.0 m and road reserve of 40.0m is to be built as a main road in a residential area. It has a initial average daily traffic of 7000 cv/day in both directions. The rate of traffic growth is 7% and the percentage of commercial vehicle is 25%. Design a flexible pavement for the road with a design life of 10 years. The CBR for sub-grade of the road is 5%. (Employ the JKR Malaysia Design Method).

Note:

Requirement of pavement layers:

i. Wearing Course = Asphalt Concrete.
ii. Road-Base Course = Crushed Aggregate.
iii. Sub-Base Course = Crushed Aggregate.  [CLO2 : C 4 ]

(20 marks)