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POLITEKNIK
Jabatan Pengajian Politeknik

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]

(4 marks)

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)