



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017**

COURSE NAME : INFRASTRUCTURE ENGINEERING
TECHNOLOGY

COURSE CODE : BNC31703/BNC40303

PROGRAMME CODE : BNB

EXAMINATION DATE : JUNE 2017

DURATION : 3 HOURS

INSTRUCTION : ANSWERS **FOUR (4)** QUESTIONS
ONLY

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

- Q1**
- (a) List out **THREE (3)** related standards for earthwork. (3 marks)

 - (b) Briefly explain **THREE (3)** main stages in earthwork process. (9 marks)

 - (c) Soil erosion is a naturally occurring process that affects all landforms. In agriculture, soil erosion refers to the wearing away of a field's topsoil by the natural physical or through forces associated with farming activities.
 - (i) State **THREE (3)** sources of soil erosion. (3 marks)

 - (ii) Sketch and label **FOUR (4)** erosion effects to the land due to poor earthwork. (4 marks)

 - (iii) Briefly discuss **THREE (3)** methods to control an erosion. (6 marks)

Q2 Table 2.1 shows ground levels and formation levels for a proposed road construction. Embankments are to be built with side slopes of 1:2.0 and cuttings with slopes of 1:1.5. The embankment crest width and cutting base width is 9 m. It may be assumed that the ground is horizontal across the section. Given, bulking factor = 0.7 and shrinkage factor = 1.0.

- (a) Calculate total equivalent volume (m^3) by using Table 2.2. (20 marks)

- (b) Draw a Mass Haul Diagram and label cut or fill slopes. (5 marks)

Q3 As an Engineering Technologist, you are required to prepare a planning for a small housing development. After completion of earthworks planning, drainage and road design will be made.

(a) Define MSMA (*Manual Saliran Mesra Alam*). (2 marks)

(b) State **THREE (3)** objectives of MSMA system. (3 marks)

(c) In MSMA chapter 14, drainage can be classified into three types. Draw and briefly explain the difference between these **THREE (3)** systems. (12 marks)

(d) Discuss and sketch **TWO (2)** types of pond or storage facilities can be applied to control stormwater drainage. (8 marks)

Q4 (a) In Malaysia, there are two types of road construction such as bituminous road and concrete road. Differentiate the road construction by:

(i) Sketching cross section for both roads. (6 marks)

(ii) Labelling and determine thickness of each layer of the road construction. (6 marks)

(b) Penggaram Town experiences traffic congestion especially during peak hours and festive season. You are required to create a suggestion to overcome the traffic congestion and state **FOUR (4)** factors in the selection of the proposal. (6 marks)

(c) Briefly explain **SEVEN (7)** processes to construct a road. (7 marks)

Q5 You are assigned to provide an infrastructure planning for a small residential site in Yong Peng. Population accommodate for 50 single storey dwelling houses. Ensure that your plans are in line with the national goal towards sustainable building and green technology. Sketch and briefly suggest only **ONE (1)** of your planning for each infrastructures below:

- (i) Building Layout.
- (ii) Roads and drainage.
- (iii) Dewatering.
- (iv) Water reticulation.
- (v) Sewerage system.

(25 marks)

-END OF QUESTIONS-

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Table 2.1 Levelling data.

Chainage	Ground Level (mAD)	Formation Level (mAD)
0	35	40
100	30	36
200	19	22
300	11	17
400	7	9
500	-3	5
600	-7	2
700	-10	2
800	15	8
900	21	11
1000	28	14

