Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	GEO SYNTHETIC DESIGN
COURSE CODE	:	BFG40403
PROGRAMME CODE	:	BFF
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **FOUR (4)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 (a) In the past few years, the development of geosynthetic has emerged an exciting engineering materials for massive infrastructure applications worldwide and delivers high value added solutions. Determine **FOUR (4)** main functions of geosynthetics and explain in details their functions with some examples in civil engineering applications.

(8 marks)

(b) Geosynthetic is used in civil engineering as one of the materials for ground improvement method to provide great performance and other advantages.

i. Explain why we need to use geosynthetics for embankment of soft soil.

(6 marks)

ii. Discuss the possiblity of using high strength geotextile in embankment of soft soil with some sketches.

(5 marks)

iii. Explain the basic mechanism of geosynthetics as a filteration and separation in designing embankment of soft soil.

(6 marks)

Q2 (a) Determine the difference between non-woven and woven geosynthetics and their functions in civil engineering application.

(8 marks)

(b) List **TWO (2)** categories of non-woven geosynthetic and discuss how these geosynthetics are produced in manufacturer.

(8 marks)

(c) Determine **TWO (2)** applications of non-woven geotextiles and discuss their functions and engineering citeria.

(9 marks)

Q3 (a) Slopes may be manmade or natural. It may be unstable and failure may occur. In some cases, the conventional methods will be very expensive and sometimes it is very difficult to construct as per the desire of the owner. Explain the role of geotextile to solve problems when dealing with soil slope.

(8 marks)

(b) List the types of geosynthetics that can be used in designing of soil slope.

(6 marks)

(c) Placement of geosynthetics at the back of a reinforced soil wall can substantially increase the soil slope stability

i. Discuss the benefits of geosynthetics placement at the back of a reinforced soil wall.

(6 marks)

ii. Explain the basic mechanism of geosynthetics to construct a steep slope.

(5 marks)

Q4 (a) Explain in details the role of geosynthetics in designing pavement for road construction.

(8 marks)

(b) Discuss the benefits of geosynthetics placement over subgrade soil

(8 marks)

(c) Determine the design life of road by using geosynthetic and explain the construction procedures of geosynthetics over subgrade soil.

(9 marks)

Q5 (a) Define smear effect in designing prefabricated vertical drain (PVD) for ground improvement

(5 marks)

(b) Explain the principles and functions of prefabricated vertical drain (PVD) in ground improvement

(10 marks)

(c) Explain in details with sketches on how to construct an embankment of soft soil using prefabricated vertical drain (PVD).

(10 marks)

- END OF QUESTIONS –