UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017

COURSE NAME	:	ADVANCED NONWOVEN TECHNOLOGY
COURSE CODE	:	BNH 30703
PROGRAMME CODE	:	BNH
EXAMINATION DATE	:	JUNE 2017
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1   (a)   List **THREE (3)** main factors that influenced the nonwoven fabric structure.

(3 marks)

(b)   List out the nonwoven fabric properties that can be obtained from:

(i)   Mechanical properties analysis

(3 marks)

(ii)   Fluid handling properties analysis

(3 marks)

(iii)   Chemical properties analysis

(3 marks)

(c)   Explain the formation of bonded web by hydroentanglement process. Discuss the effects of water jet pressure towards the fabric structure.

(6 marks)

(d)   Propose the most suitable nonwoven manufacturing process for geotextiles application. Identify the bonding effect of this kind of method.

(2 marks)

Q2   (a)   Differentiate the bonding characteristic of thermal bonded fabric and chemical bonded fabric. Draw the bonded structure for each fabric.

(6 marks)

(b)   A nonwoven fabric structure is to be produced by needle punching process. Discover at least **THREE (3)** manufacturing parameters that need to be considered and explain the effects of each parameter towards the bonding structure.

(6 marks)

(c)   Identify **THREE (3)** types of nonwoven finishing under wet and dry finishing category.

(6 marks)

(d)   List the **TWO (2)** methods of chemical finishing on nonwoven fabric.

(2 marks)

Q3 (a) NV Sdn. Bhd. has produced a sample of thermally bonded fabrics for baby diapers. The fabrics turned out to be a bit stiff and the water penetration is too slow. State the parameters that should be improved to increase the performance of the fabrics.

(4 marks)

(b) As a textile engineering technologist, determine the most suitable finishing method to remove contamination of nonwoven fabric. Point out the key factors to improve the efficiency of the method.

(4 marks)

(c) Differentiate between the purpose of chemical finishing and surface finishing.

(4 marks)

(d) Nonwovens in automotive sector are used in car carpets, tray coverings, luggage compartment linings and many others.

(i) Identify the favoured method for web formation and web bonding for this kind of application.

(2 marks)

(ii) Plan a suitable finishing treatment to add strength, to provide durable flame retardants and to improve the fibre surface for the application.

(6 marks)

Q4 (a) There are several methods in measuring the pore size distributions of nonwoven fabric. Select **THREE (3)** of the methods and distinguish the test mechanisms.

(6 marks)

(b) "Intelligent nonwovens: Applications in technical sector". Discuss in detail on the topic.

(8 marks)

(c) Describe the mechanism of water vapour transmission analysis on nonwovens fabric. List **TWO (2)** factors affected the liquid permeability on the fabric structure.

(4 marks)

(d) Recommend the suitable nonwoven filter used in vacuum cleaner in terms of pore size and fabric weight.

(2 marks)

Q5 (a) As a textile engineering technologist, you are assigned to develop new baby diaper as one of the new product for your company. Plan a process involved starting from raw material selection, web formation method, web bonding method, treatment and finishing and the testing.

(10 marks)

(b) List the test methods needed for the following nonwovens application.

(i) Surgical Gowns

(3 marks)

(ii) Carpets

(3 marks)

(c) The fire resistance is defined as "the complex of physical and chemical transformations to which the material is subjected under the action of fire". In order to assess the fire resistance of nonwovens fabric behaviour, analyse **FOUR (4)** factors that have to be taken into account.

(4 marks)

-END OF QUESTIONS –

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