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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2017/2018**

COURSE NAME : ADVANCED NONWOVEN  
TECHNOLOGY

COURSE CODE : BNH 30703

PROGRAMME CODE : BNH

EXAMINATION DATE : JUNE / JULY 2018

DURATION : 2 HOURS 30 MINUTES

INSTRUCTION : ANSWER ALL QUESTIONS

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

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- Q1**
- (a) Identify **THREE (3)** principles of thermal bonding. (3 marks)
  - (b) Select **SIX (6)** machine components in the Hydroentanglement bonding process for production of nonwoven fabric. (3 marks)
  - (c) Construct a new machine concept for producing 3-D stitch-bonded fabrics. (9 marks)
  - (d) Categories **FOUR (4)** important nonwoven fabric tests for each at the following properties.
    - (i) Mechanical properties
    - (ii) Fluid handling properties
    - (iii) Physical properties
    - (iv) Chemical properties
    - (v) Application specific performance(5 marks)
- Q2**
- (a) Describe **FOUR (4)** scope of fabric testing related to the end-use conditions of a fabric material. (4 marks)
  - (b) Draw the schematic diagram and prescribe the method of measurement for the mechanical test below:
    - (i) Bursting strength
    - (ii) Tensile strength(10 marks)
  - (c) Identify **TWO (2)** factor affecting abrasion resistance. (2 marks)
  - (d) Compare **FOUR (4)** traditional and new methods of testing the fabric content and composition. (4 marks)

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- Q3** (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”. Elaborate on the topic. (8 marks)
- (c) Describe the mechanism of water vapour transmission on nonwovens fabric. List **TWO (2)** factors affecting the liquid permeability on the fabric structure. (4 marks)
- (d) Identify the suitable nonwoven filter used in vacuum cleaner in terms of pore size and fabric weight. (2 marks)
- Q4** (a) As a textile engineering technologist, you are assigned to develop new baby diaper as one of the new product for your company. Plan the process involved starting from the raw material selection, web formation method, web bonding method, treatment and finishing and the testing. (10 marks)
- (b) Suggest the test methods needed for the following nonwoven applications.
- (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 nonwoven fabric behaviour, analyse **FOUR (4)** factors that have to be taken into account. (4 marks)

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- Q5** (a) State **FIVE (5)** advantages of using nonwovens in the agriculture sector. (5 marks)
- (b) The use of nonwovens in the automotive industry is continually growing due to the high speed production, low cost, recyclability and the ability to make composite materials. Propose nonwoven fabric innovation that has been made related to the automotive industry. (10 marks)
- (c) Discover the production of a sustainable insulating nonwovens for roofing or wall, in order to promote green and sustainable technology in building and construction area. (5 marks)

-END OF QUESTIONS -

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