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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : INTRODUCTION TO NONWOVEN TECHNOLOGY
COURSE CODE : BNH 30503
PROGRAMME CODE : BNH
EXAMINATION DATE : DECEMBER 2016 / JANUARY 2017
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : ANSWERS ALL QUESTIONS

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

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- Q1**
- (a) Explain the difference between conventional fabric production and non-woven fabric production. (2 marks)

 - (b) In terms of productivity rate, identify the advantages of non-woven process. You may support your answers with examples. (4 marks)

 - (c) Discuss the effects of low fibre extension towards web forming. (2 marks)

 - (d) Classify the following web forming processes with the suitable fibre type.
 - (i) Dry-laid
 - (ii) Wet-laid
 - (iii) Air-laid(6 marks)

 - (e) Principles of carding in web forming process can be explained in two basic actions; working and stripping actions. With the aid of diagram, demonstrate the process of working and stripping actions. (6 marks)

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- Q2** (a) Principles of wet-laying is almost similar to paper manufacturing process. Justify the reasons why wet-laying process was developed. Highlight **TWO (2)** products made of wet-laying process. (4 marks)
- (b) Air-laid processes was invented to overcome the high degree of anisotropy in fabrics made from carded web. Discuss the characteristic of web produced by air-laid process. (4 marks)
- (c) Construct the stages involved in spunbond production. List **FOUR (4)** primary factor in the production of spunbonded fabrics. (8 marks)
- (d) Meltblown technology is one of the newer and least developed nonwoven process. Explain the working principles of meltblown process. (4 marks)
- Q3** (a) Glass microfibers (inorganic fibres), need to be processed to produce filtration materials.
- (i) As this fibres are very small in diameter, rigid and easily broken, initiate the suitable web formation method to handle this fibres. (2 marks)
- (ii) Discuss the fibre preparation for this fibres (6 marks)
- (b) Differentiate the principles of needlepunching method and hydroentanglement method. (4 marks)
- (c) Sketch the felting needle structure and identify the components involved. (4 marks)
- (d) Distinguish between single reduction and double reduction felting needle. (4 marks)

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- Q4** (a) XYZ Enterprise is planning to produce apparel interlinings for domestic market next year and had chosen chemical bonding as web bonding method. There are several methods of applying binder system to a web such as saturation, foam, spray and print bonding. As a textile technologists, propose a suitable web bonding method to produce the product and give your reasons. (6 marks)
- (b) Products such as carpet underlay, insulation, mattress padding and rough blanket were usually made by needlepunching process. With aid of diagram, construct the basic principles of needle punching. (4 marks)
- (c) Barbs are the most important part of the needle in needlepunching process. State the purpose of barbs and sketch **TWO (2)** different types of barb shape. (4 marks)
- (d) Explain the needle action in a needle punching process. (2 marks)
- (e) Analyse **FOUR (4)** factors that gives effect on the puncture density on needlepunching process. (4 marks)
- Q5** (a) Identify **FOUR (4)** essential characteristics of the binder polymer for thermal bonding process. (4 marks)
- (b) Differentiate the area bonding and point bonding in thermal bonding method. (6 marks)
- (c) Debate the statement below.
- “Chemical bonding is significantly energy saving, less environmental impact, economically attractive and have high production rate compared to the thermal bonding”
- (10 marks)

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-END OF QUESTIONS -