



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(TAKE HOME)
SEMESTER I
SESSION 2020/2021**

COURSE NAME : TECHNICAL TEXTILES
COURSE CODE : BNH 40503
PROGRAMME CODE : BNH
EXAMINATION DATE : JANUARY/ FEBRUARY 2021
DURATION : 3 HOURS
INSTRUCTION : ANSWERS ALL QUESTIONS
OPEN BOOK EXAMINATION

TERBUKA

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

- Q1** (a) Fabrics are the largest component of the filter media where woven and needlefelt fabrics are commonly used. Compare the filtration mechanism of both fabrics. (6 marks)
- (b) The fibre selection are the most fundamental consideration when designing the filter fabric. Mr. Norman has three fibres option; polyester, polypropylene and cotton to produce a filter for liquid application that might be exposed to acids, alkalis and mild solvents. Argue the best fibre selection for that particular request. (10 marks)
- (c) Two spunbond filters; Filter A and B were tested to measure their performance. Quantity of particles at the upstream is 5 g while at the downstream, 0.2 g and 0.7 g were collected for Filter A and B, respectively.
- (i) Calculate the filtration efficiency and penetration percentage of the filters. (5 marks)
- (ii) Analyse the result in **Q1(c)(i)** and relate the answer on the formation of cake filtration (4 marks)
- Q2** (a) Two of synthetic fibres commonly used for geotextile application are polypropylene and polyester. Explain the important of these fibres in geotextile applications. (4 marks)
- (b) Natural fibres have the greatest potential for use in geotextiles. Discuss the advantages of using natural fibres in geotextiles. (3 marks)
- (c) Geocomposite comprises of woven/nonwoven and membrane/nonwoven were chosen for containment purpose.
- (i) Between needlepunched nonwoven and heat-bonded nonwoven, debate a suitable nonwoven fabric for this purpose. (4 marks)
- (ii) Explain the manufacturing process of nonwoven fabric chosen in **Q2(c)(i)**. (4 marks)
- (iii) Explain the composite structure of both geocomposite. (6 marks)
- (iv) Recommend composite structure that suitable for the containment purpose. (4 marks)

TERBUKA

- Q3** (a) Classify the following products into various segment of technical textiles. Justify your answer.
- (i) Bullet proof vest
 - (ii) Wipes
 - (iii) Wind breaker
- (6 marks)
- (b) Implantable materials are used in effecting repair to the body whether it be wound closure (sutures) or replacement surgery (vascular grafts, artificial ligaments, etc.) Give an example of an implantable material and explain the end uses and characteristics of the material.
- (6 marks)
- (c) Protective textile is one kind of technical textile which provides some protective functions like heat protection, ballistic protection, hazardous chemical protection, cold protection
- (i) Demonstrate how flame-resistant fabrics are designed?
- (5 marks)
- (ii) Discuss the fabric parameters that could influence the ultraviolet radiation protection.
- (4 marks)
- (iii) List out **FOUR (4)** important considerations in designing chemical protective clothing.
- (4 marks)
- Q4** (a) Discuss the design and functional requirement for tennis shirt. Please include the type of fibre, the mechanism and manufacturing technique.
- (6 marks)
- (b) Layering and zoning technique are two of the recent trends used in design aspects of sport tech. Illustrates and explain how the mechanism of the layering technique improve the functional and comfort performance of the garment.
- (4 marks)
- (c) Modern clothing sometimes includes electronic components such as solar panels in rucksacks, GPS Satellite Navigation tracking devices in outdoor clothing, Internet communication and entertainment devices in jackets. Explain in detail the benefits to the wearer of using this type of new technology
- (8 marks)
- (d) Refer to **Figure Q4(d)** and name a fabric that can be used to make this toy. List out and explain **THREE (3)** different ways to use electronic components to make this toy more exciting. An example has been given in **Table Q4(d)**.
- (7 marks)

-END OF QUESTION -

TERBUKA

FINAL EXAMINATION

SEMESTER / SESSION : SEM I / 2020/2021
COURSE NAME : TECHNICAL TEXTILES

PROGRAMME CODE : BNII
COURSE CODE : BNH 40503

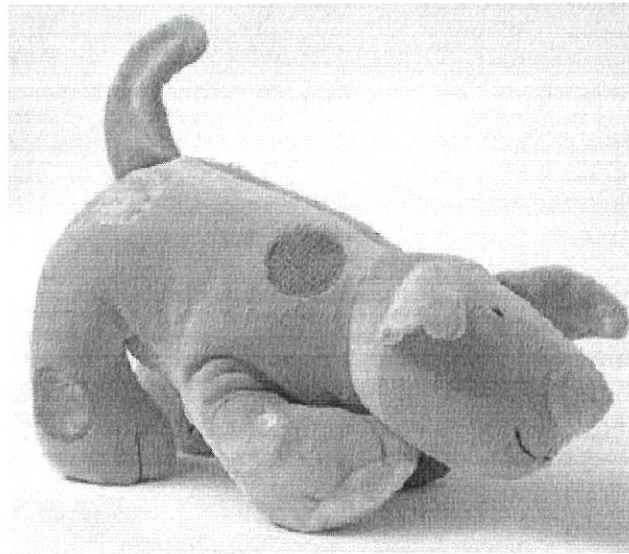


Figure Q4(d)

Table Q4(d)

Electronic component	Explanation
<i>A movement device is put in the toy</i>	<i>The toy dog can move its tail when walking</i>
1.	
2.	
3.	

TERBUKA