



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019**

COURSE NAME : ENGINEERING POLYMER
AND CERAMIC

COURSE CODE : BDB 40603

PROGRAMME CODE : BDD

EXAMINATION DATE : DECEMBER 2018 / JANUARY
2019

DURATION : 3 HOURS

INSTRUCTION : ANSWER FIVE (5)
QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

TERBUKA

- Q1**
- a) Explain the differences between monodisperse and polydisperse polymer with suitable diagrams. (5 marks)
- b) Interpret the important and unimportant property of polymers with low melting point. (5 marks)
- c) (i) A number of new polymers having unique and desirable combinations of properties have been developed over the past several years. State the categories of this newly develop materials. (5 marks)
- (ii) Evaluate on the above types of newly develop materials that is benefited in daily life. (5 marks)
- Q2**
- (a) (i) Write the structures and monomers for ABS. (5 marks)
- (ii) Draw a suitable diagram to differentiate the properties of ABS for tensile and impact strength with refer to rubber content (%). (5 marks)
- (b) (i) Evaluate the important property of PTFE. (5 marks)
- (ii) Write on the PTFE as compared to other polymer in recent trend application? (5 marks)
- Q3**
- (a) (i) Explain the important properties for *Kevlar*®. (5 marks)
- (ii) Choose the suitable application for *Kevlar*® that leads into the military or other important applications? (5 marks)
- (b) (i) Examine the advantages of polymers over metals or ceramics. (5 marks)
- (ii) Write the disadvantages of polymers relative to metals or ceramics. (5 marks)

- Q4** (a) Identify FIVE (5) advantages of ceramic material selection in various design applications. (5 marks)
- (b) Anisah mills the ceramic powders at a speed of 125 rpm. The critical speed for the milling process is 150 rpm. In your opinion, does Anisah use the appropriate milling speed? Explain your answers. (5 marks)
- (c) Faruq found that ceramic particles in the produced slurry were agglomerated and not distributed uniformly. Therefore, he used an additive and lubricant to overcome this problem. Justify whether the additive that has been applied by Faruq is suitable or not? Suggest TWO (2) additives that can overcome the particles agglomeration problem. (5 marks)
- (d) Improvement in ceramic materials is going to be seen when it comes to strength, nonreactivity, compatibility, durability, porosity for tissue growth or costs minimization. Distinguish the limitation of porosity for tissue growth application in ceramic material. (5 marks)
- Q5** (a) Explain the different in water composition for wet forming, plastic forming dry forming and state ONE (1) technique for each of these forming techniques. (5 marks)
- (b) Choose the most applied ceramics coating for metallic implants. (5 marks)
- (c) Examine the important of bone fillers. (5 marks)
- (d) Select the primary factors in avoiding defects in drying. (5 marks)
- Q6** (a) One component of green ceramic body is made from clay have gone through casting process will be heated at sintering temperature at 1200°C. Determine the required steps that need to be taken before and after sintering to ensure no defect and failure to this ceramic body. (5 marks)
- (b) Sketch the sintering profile plot for one ceramic product produced by using slip casting technique. Sintering temperature for this product is given as 1200°C. (5 marks)

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- (b) Sketch the sintering profile plot for one ceramic product produced by using slip casting technique. Sintering temperature for this product is given as 1200°C . (5 marks)
- (c) (i) State TWO (2) techniques of colour decoration process for glaze coating on the final surface of ceramic porous body. (5 marks)
- (ii) Formulate your own glass raw materials in general ratios. (5 marks)

-END OF QUESTION -