UNIVERSITI TUN HUSSEIN ONN MALAYSIA

PEPERIKSAAN AKHIR
SEMESTER II
SESI 2011/2012

KURSUS	:	KEJURUTERAAN POLIMER DAN SERAMIK
KOD KURSUS	:	BDB 4063
PROGRAM	:	4 BDD
TARIKH PEPERIKSAAN	:	JUN 2012
MASA	:	2 JAM
ARAHAN	:	JAWAB DUA (2) SOALAN DARI BAHAGIAN A DAN DUA (2) SOALAN DARI BAHAGIAN B

BUKU PEPERIKSAAN INI MENGANDUNGI ENAM (06) MUKASURAT

PART A (ANSWER TWO (2) QUESTIONS ONLY FROM PART A)

Q1 (a) Berikan definasi purata berat molekul, M_m bagi termoplastik.

Defines average molecular weight, M_m for a polymer (4 Marks)

(b) Kirakan purata berat molekul M_m bagi termoplastik yang mempunyai pecahan berat molekul seperti di dalam julat yang diberi:

Calculate the average molecular weight M_m for a thermoplastic that has the following weight fractions f_i for the molecular weight ranges listed:

Molecular Weight Range (g/mol)	f_i	Molecular Weight Range (g/mol)	f_i
0-5000	0.01	20,000-25,000	0.19
5000-10,000	0.04	25,000-30,000	0.21
10,000-15,000	0.16	30,000-35,000	0.15
5,000-20,000	0.17	35,000-40,000	0.07

(6 Marks)

(c) Bezakan dan lakarkan proses pempolimeran berikut:
(i) pukal,
(ii) larutan,
(iii) ampaian, dan
(iv) enapan

Differentiate and illustrate the following polymerization processes:
(i) bulk,
(ii) solution,
(iii) suspension, and
(iv) emulsion. (10 Marks)

(d) Berikan satu kaedah yang digunakan bagi menghasilkan Polietelina berketumpatan rendah. Apakah kelebihan process ini.

Give an example of method use to produce Low Density Polyethylene.
What are the advantages of this process. (5 Marks)

Q2 (a) Nyatakan perbezaan antara homopolimer dan copolymer.

Distinguish between a homopolymer and a copolymer. (4 Marks)

(b) Apakah hasil sampingan akhir yang biasanya dikeluarkan dari pempolimeran berperingkat.

What by-products are commonly produced by stepwise polymerization? (6 Marks)

(c) Huraikan dan lakarkan "fringed-micelle" dan "folded-chain" model bagi struktur yang mempunyai sebahagian termoplastik berkristal. Adakah terdapat persamaan dengan pembuatan BOPP?

Describe and illustrate the fringed-micelle and folded-chain models for the structure of partly crystalline thermoplastics. Is there any similarity with BOPP production? (10 Marks)

(d) Apakah yang menyebabkan BOPP menjadi popular pada masa kini.

Why BOPP becomes popular nowadays. (5 Marks)

Q3 (a) Apakah tiga (3) jenis tindakbalas utama yang berlaku semasa pempolimeran berantai?

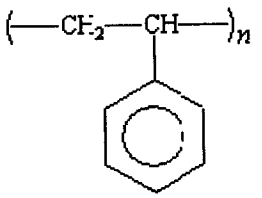
What are the three major reactions that occur during chain polymerization? (4 Marks)

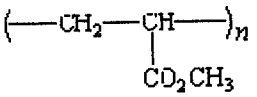
(b) Bagaimanakah pemprosesan termoplastik kepada bentuk tertentu berbeza berbanding pemprosesan termoset plastik.

How does the processing of thermoplastics into the desired shape differ from the processing of thermosetting plastics? (6 Marks)

(c) Kira berat molekul bagi *polystyrene and poly(methyl acrylate).*

Find the molecular weight of polystyrene and poly(methyl acrylate).





(10 Marks)

(b) The Yonex Nanogy 98 (NBG-98) has a sharp feeling with 0.66mm gauge. The Yonex Nanogy 98 (NBG-98) string has excellent repulsion for high clear and defensive shots. The NBG-98 uses an original Carbon nano Fiber that gives powerful repulsion combined with high durability. The Nanogy 98 (NBG-98) is suited for players who look for resilience to increase speed and durability for longer lasting string.

How the manufacturer of NBG-98 make this statement more realistic.

(5 marks)

PART B (ANSWER TWO (2) QUESTIONS ONLY FROM PART B)

Q4 (a) Apakah yang menyebabkan kerapuhan pada bahan seramik?

What would result the brittleness of ceramic materials? (4 Marks)

(b) Kategorikan bahan seramik berdasarkan kepada komposisinya.

Categorize ceramic materials based on its compositions (6 Marks)

(c) Sediakan suatu prosedur asas untuk menghasilkan silikon karbida daripada bahan mula polimer.

Prepare a basic procedure to produce silicon carbide from polymer precursor. (10 Marks)

(d) Ahmad mensinter sampel zirkonia pada suhu 1200°C selama 24 hours. Apakah hasil yang mungkin diperolehi dari kaedah Ahmad itu?

Ahmad is sintering a zirconia sample at 1200°C for 24 hours. What do you see as possible outcomes of Ahmad's method? (5 Marks)

Q5 (a) Membran seramik boleh dihasilkan menerusi tuangan pita. Apakah contoh kaedah lain yang membolehkan membran seramik dihasilkan?

Ceramic membrane can be made by using tape casting. What are another instance where ceramic membrane can be made? (4 Marks)

(b) Apakah fungsi sodium silikat di dalam tuangan slip?

What is the function of sodium silicate in slip casting? (6 Marks)

(c) Hasilkan carta alir bagi pengeluaran suatu bata poros menerusi kaedah *paperclay*.

Create a flow chart for the production of a porous brick using paperclay technique. (10 Marks)

(d) Ahmad mensinter suatu jasad alumina di dalam krusibel tanahliat pada suhu 1650°C. Apakah hasil proses tersebut?

Ahmad is sintering an alumina body placed in a clay crucible at 1650°C. What will be the outcome of the process? (5 Marks)

Q6 (a) Lakarkan satu rajah bagi menggambarkan proses pengisaran.

Sketch a diagram to illustrate milling process. (4 Marks)

(b) Bagaimanakah metalurgi serbuk mempunyai kebersamaan dengan pemprosesan seramik.

How was powder metallurgy similar to ceramic processings? (6 Marks)

(c) Apakah faktor-faktor yang akan anda pertimbangkan seandainya anda perlu menghasilkan seramik padat?

What factors will you consider if you need to produce dense ceramic? (10 Marks)

(d) Bagi mendapatkan serbuk silika bersaiz nano, Ahmad menggunakan pengisar bebola tenaga-tinggi semasa proses pengisaran. Kritik tindakan ini.

In order to obtain a nano-size silica powder, Ahmad uses a high-energy ball mill in grinding process. Critise this action. (5 Marks)