Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2016/2017

COURSE NAME	:	MATERIALS TECHNOLOGY AND SELECTION
COURSE CODE	:	BPC 21903
PROGRAMMECODE	:	BPB
EXAMINATION DATE	:	DECEMBER 2016 / JANUARY 2017
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWERS **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 (a) Distinguish the functions of matrix and dispersed phase in the composites materials.

(8 marks)

(b) Suggest **ONE (1)** suitable application for both the following composite and justify answer:

(i) Polymer matrix composites
(ii) Ceramic matrix composites

(12 marks)

Q2 (a) Explain the following terms with appropriate example in health industry.

(i) Nanotechnology
(ii) Advanced Materials

(12 marks)

(b) Explain the properties and applications of nanomaterials and advanced materials.

(8 marks)

Q3 (a) Illustrate the typical stress-strain behavior by showing the following important point:

(i) Maximum stress
(ii) Yield stress
(iii) Elastic region
(iv) Fracture point

(8 marks)

(b) You are required to conduct types of impact tests on a metal specimen.

Explain both of this impact tests by the assistance of appropriate illustration of the samples.

(4 marks)

(c) Differentiate between a fatigue test and a creep test.

(4 marks)

(d) Describe the concept of strength and ductility of materials

(4 marks)

Q4 (a) Describe Chemical Properties and Optical Properties with **TWO (2)** examples of each properties.

(6 marks)

(b) Distinguish between Thermal Expansion and Thermal conductivity.

(4 marks)

(c) Ceramic HIJ was sintered and weight 425 grams when dry, 335 grams when suspended in water, and 435 grams when wet. The true density of a ceramic is 4.97g/cm^3. Calculate the percentage of the following:

(i) Apparent porosity (3 marks)

(ii) Total porosity (4 marks)

(iii) Closed porosity (3 marks)

Q5 (a) Describe the following:

(i) Galvanic corrosion
(ii) Abrasive wear

(5 marks)

(b) Sketch and explain **TWO (2)** fracture modes that can occur in ferrous/nonferrous materials.

(5 marks)

(c) Discuss **TWO (2)** techniques to find the leak in the material using dye penetrant technique.

(10 marks)

-END OF QUESTIONS –