

University Examinations 2018/2019 SCHOOL OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING SECOND YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN MECHANICAL ENGINEERING MEDPR 219: MATERIAL SCIENCE III

DATE: 8/5/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS:

Answer Question One (Compulsory) and Any Other Two Questions

QUESTION ONE (30 MARKS)

a)	Differentiate between Macro and Micro examinations		(4 marks)
b)	Define Polymeric materials		(2 marks)
c)	i	define ceramics	(2 marks)
	ii	State any four properties of ceramics	(4 marks)
d)	Describe the following classes of plastics;		
	i.	Thermosetting	
	ii.	thermoplastics	(4 marks)
e)	i	state four properties of Polymeric materials	(4 marks)
	ii	state any four applications of Polymeric materials	(4 marks)
f)	describe briefly the principle of micro-examination using a sketch (6		(6 marks)

QUESTION TWO (20 MARKS)

Describe the following thermal equilibrium diagrams using sketches;

a)	simple eutectic type;	(6 marks)
b)	combination type;	(7 marks)

QUESTION THREE (20 MARKS)

Explain the following material testing processes using sketches;

- a) Ultra-sonic testing
- b) Eddy current
- c) Magnetic particles
- d) Gamma rays method

QUESTION FOUR (20 MARKS)

- a) discuss the following types of ceramic materials;
 - i. crystalline
 - ii. non- crystalline (6 marks)
- b) Describe any three applications of and three products of ceramic engineering. (6 marks)
- c) Using sketches describe the etching process in metallography (8 marks)

QUESTION FIVE (20 MARKS)

Describe the following types of plastics stating properties, use and its application.

- a) Urea formaldehyde
- b) Melamine formaldehyde
- c) Phenolic formaldehyde
- d) Polypropylene
- e) Polytetrafluoroethylene