



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of Mechanical & Automotive Engineering
UNIVERSITY EXAMINATION FOR:
Diploma in Mechanical Engineering (Production Option, Y2S1)
EPR 2201 : Production Technology & Practice I (Paper 2)
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: SEPTEMBER 2018
TIME: 2 HOURS
DATE: Sep 2018

Instruction to Candidates:

You should have the following for this examination

- *Examination Pass & Student ID Card*
- *Answer booklet*
- *Non-Programmable scientific calculator*

This paper consists of **FIVE** questions. Attempt any **THREE** questions.
Maximum marks for each part of a question are as shown.

Do not write on the question paper.

Question ONE

- a) Define the following terms as used in Casting: **(3 marks)**
- Sand conditioning
 - Core
 - Core-binder
- b) List 4 reasons that make sand a suitable material for casting moulds. **(4 marks)**
- c) Explain any two casting defects **(4 marks)**
- d) Explain how a sub-merged plunger type die casting machine works **(6 marks)**
- e) List three limitations of Die casting. **(3 marks)**

Question TWO

- a) Define the following metal cutting operations: **(3 marks)**
- Orthogonal cutting
 - Oblique cutting

- b) Illustrate the geometry of a single point cutting tool (6 marks)
- c) List the four types of chips that are formed during metal cutting operation (4 marks)
- d) List four functions of coolants in metal cutting. (4 marks)
- e) Define the following tool angle: (3 marks)
 - i. Back rake angle
 - ii. Side rake angle

Question THREE

- a) Define the following terms with respect to plastics: (6 marks)
 - i. Thermosetting plastics
 - ii. Thermoplastic plastics
 - iii. Plastics
- b) Illustrate with the help of a well labelled sketch and briefly describe the injection moulding process as a basic process in plastic moulding. (6 marks)
- c) List four advantages of plastics as engineering material. (4 marks)
- d) With the aid of a well labelled diagram, illustrate the flash type compression moulding process as used with plastics. (4 marks)

Question FOUR

- a) List any three essentials of a gas mixer in a welding torch. (3 marks)
- b) Explain the different uses of the carburizing and oxidizing flame in gas welding applications. (3 marks)
- c) Differentiate the following two types of welding techniques used in gas welding:
 - i. Fore hand welding
 - ii. Backhand welding
 (4 marks)
- d) Explain the function of the following devices in the oxyacetylene equipment.
 - i. Welding torch
 - ii. Pressure regulator
 - iii. Cylinders
 (6 marks)
- e) List any four defects which are likely to be found in the arc and gas welds. (4 marks)

Question FIVE

- a) Define the following terms as used in drilling operations. (5 marks)
 - i. Drilling
 - ii. Reaming
 - iii. Boring
 - iv. Counter boring

v. Counter sinking

- b) Draw a clear sketch of a twist drill and indicate the following parts; **(7 marks)**
Tang; Land; Lip; Body; Flute; Rake Angle; Axis of Drill.
- c) Find the time required for drilling an 18 mm hole in a work piece having a thickness 50 mm. Assume cutting speed 12 metres/minute and feed 0.2 mm/revolution. Neglect the length of approach. **(5 marks)**
- d) List three precautions that should be observed to ensure best results while performing drilling operations. **(3 marks)**