



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Engineering & Technology

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATIONS FOR DEGREE IN
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING
(YR. IV)

EMG 2421: PRODUCTION TECHNOLOGY II

END OF SEMESTER EXAMINATIONS

SERIES: APRIL 2015

TIME: 2 HOURS

INSTRUCTIONS:

- This paper consists of FIVE questions.
- Answer any **THREE** questions
- You should have: Drawing instruments, scientific calculator for this examination.

This paper consists of Three printed pages

QUESTION 1

a) Briefly describe the following methods of cleaning metals:

- i) Abrasive blasting
- ii) Electrolytic pickling
- iii) Alkaline descaling
- iv) Brushing
- v) Tumbling

(10 marks)

b) Describe the following mechanical finishing processes:

- i) Polishing
- ii) Buffing
- iii) Shot peening
- iv) Burnishing

(10 marks)

QUESTION 2

- a) Describe the following pressure welding techniques;
- i) Spot welding
 - ii) Butt welding
- (14 marks)**
- b) A mild steel tube, 2.0mm thick is to be seam welded, using a circular electrode 210mm diameter. The welding cycle consists of 3 cycles “on” and 2 cycles ‘off’, and the welding speed is 4 welds per 10mm. when the frequency of power supply is 50Hz and assuming the effective resistance between electrodes as $100 \mu\Omega$ calculate:
- i) The work speed
 - ii) Revolution per minute of the electrode
 - iii) Energy requirement.
- 2.0mm requires a current of 12,000A.
- (6 marks)**

QUESTION 3

- a) Distinguish between D. C welding and AC arc welding. **(7 marks)**
- b) State the precautions to be observed during arch welding. **(3 marks)**
- c) Explain submerged arc welding. **(10 marks)**

QUESTION 4

- a) Explain the principles of electro-discharge machining (EDM). **(7 marks)**
- b) Describe the operations of relaxation spark generator of an EDM machine. **(6 marks)**
- c) State any **THREE** factors which affect metal removal during EDM machining. **(4 marks)**
- d) i) List any **THREE** functions of a dielectric fluid and
ii) List any **THREE** properties of a dielectric fluid
iii) Name any **TWO** dielectric fluids used in E.D. M. machining. **(4 marks)**

QUESTION 5

- a) Describe Abrasive Jet Machining (AJM). **(8 marks)**
- b) State the effect of any **FOUR** parameters on the metal removal rate in AJM. **(4 marks)**
- c) Explain Ultrasonic Machining (USM.) **(8 marks)**