



TECHNICAL UNIVERSITY OF MOMBASA

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

FOUR YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE
IN BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING (BSME)

EMG 2421 PRODUCTION TECHNOLOGY II

END OF SEMESTER EXAMINATIONS

SERIES: DECEMBER, 2013

TIME: 2 HOURS

INSTRUCTION TO CANDIDATES

1. You should have the following for this examination:-
 - Answer Booklet
 - Scientific Calculator
 - Drawing Instruments
 2. This paper consists of **FIVE** questions.
 3. Answer **ANY THREE** Questions.
 4. Maximum marks for each part of Question are as shown.
 5. This paper consists of **TWO** printed pages.
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Question ONE

- (a) Describe the following pressure welding techniques.
 - (i) Spot welding
 - (ii) BUH 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 TWO

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

Question THREE

- (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 rate during EDM machining. (3 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 FOUR

- (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)

Question FIVE

- Explain **FIVE** methods used for cleaning metals. (20 marks)