GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY
Faculty of Engineering
Department of Mechanical Engineering

BSc Engineering Degree
Semester 1(2nd Batch) Examination – July 2022
(Intake 39 - Engineering)

ME 1103- WORKSHOP TECHNOLOGY

Time allowed: 3 hours 11 July, 2022

INSTRUCTIONS TO CANDIDATES

This paper contains 5 questions on 4 pages

Answer ALL questions

This is a closed book examination

This examination accounts for 70% of the module assessment. A total maximum mark obtainable is 100. The marks assigned for each question and parts thereof are indicated in brackets

If you have any doubt as to the interpretation of the wordings of a question, make your own decision, but clearly state it on the script

Assume reasonable values for any data not given in or provided with the question paper, clearly make such assumptions made in the script

All examinations are conducted under the rules and regulations of the KDU

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Question 01

(a) Describe the basic metal classification. **(04 Marks)**

(b) Briefly describe two properties and two applications of following materials. **(08 Marks)**

i. Polymers

ii. Composites

iii. Semiconductors

iv. Biomaterials

(c) Explain the reason why the temperature of a work piece is maintained in a constant value while performing any machining process. **(04 Marks)**

(d) Briefly explain the process of obtaining cast iron using a furnace. **(04marks)**

Question 02

(a) Briefly describe five different types of work holding devices used in a lathe machine with neat sketches. **(05 marks)**

(b) Explain the difference between facing and turning as lathe operations. Use sketches where required. **(04 marks)**

(c) Briefly explain three properties required for a lathe machine tool. **(06 marks)**

(d) Discuss what are the safety practices to be followed to prevent accidents when operating the lathe machine. **(05 marks)**

Question 03

(a) Briefly explain the process of shell molding. **(06 marks)**

(b) Describe three advantages of vacuum casting over sand casting process. **(03 marks)**

(c)

i. What are the two main types of casting process. **(02marks)**

ii. Briefly describe die casting process. Use sketches where needed. **(04 marks)**

(d) Discuss five casting defects. **(05 marks)**

Question 04

(a) Describe three different types of rolling operations. **(06 Marks)**

(b) Explain the difference between direct and indirect extrusion process. **(04 Marks)**

(c) Briefly describe three advantages and three disadvantages of forging as a manufacturing method. **(06 Marks)**

(d) Explain two types of shearing operations. **(04 marks)**

Question 05

(a)

i. Briefly describe the main purpose of using flux during welding process. **(02 marks)**

ii. What are three main forms of welding flux. **(03 marks)**

(b) Explain three main types of flames which can be observed in oxy-acetylene welding. **(06Marks)**

(c) Write brief descriptions for topics mentioned below. **(06Marks)**

i. Submerged arc welding (SAW)

ii. Gas metal arc welding (GMAW)

iii. Gas tungsten arc welding

(d) Briefly describe points to be concerned in maintaining and transportation of oxygen/acetylene cylinders. **(03 Marks)**

End of question paper