

Department of Mechanical Engineering
Birla Institute of Technology and Science, Pilani, Pilani campus
MF F316: Machining and Machine Tools
Mid Semester Examination (17/03/2023)
Time: 90 min; Max. Marks: 30

Note to Students:

1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
 2. This is an OPEN BOOK test.
 3. Assumptions made if any, should be stated clearly at the beginning of your answer.
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1. Merchant's Circle Diagram was derived for evaluating forces involved during machining. However, there were certain limitations in it due to which modified Merchant's theory (MMT) was established. 5+10 = 15
 - a) Explain the limitations of MCD
 - b) Derive the cutting forces and minimum energy consumption criteria for MMT.

2. Determine the co-efficient of friction between tool and chip.
 $t_1=0.25$ mm, $t_2=0.75$ mm, $w=2.5$ mm, $\alpha=0^\circ$, $F_C=1000$ N, $F_T=500$ N 5

3. Explain size effect with schematic. 10

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