

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2023)

CLASS: BTECH
BRANCH: MECHANICAL

SEMESTER: V
SESSION: MO/2023

SUBJECT: ME367 INDUSTRIAL TRIBOLOGY

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL
Q.1(a)	Differentiate between lays and flaws in a surface.	[2]	1 4
Q.1(b)	For a sinusoidal profile of maximum amplitude unity, find out the ratio of R_a/R_q . Here R_a denotes the center-line average roughness while R_q denotes root mean square roughness.	[3]	1 3
Q.2(a)	Distinguish between average peak to valley height, ten-point height and average peak to mean height.	[2]	1 4
Q.2(b)	Explain deformed layer and chemically reacted layer from tribological perspective illustrating them with a sketch.	[3]	1 2
Q.3(a)	Explain sliding, rolling and spin with respect to rolling friction giving suitable illustration.	[2]	2 2
Q.3(b)	Formulate the expression for coefficient of friction given by Bowden and Tabor's simple adhesion theory stating the limitations thereof.	[3]	2 3
Q.4(a)	Two hard conical sliders of semi-angles 70° and 80° are slid against a lubricated metal surface. The ratio of the coefficient of friction obtained using the two sliders is 1.2. Calculate the adhesive component of the coefficient of friction. Assume that the dominant sources of friction are adhesion and ploughing and that these are additive.	[2]	2 3
Q.4(b)	Find out an expression for the ploughing component of friction considering a hard transverse cylindrical asperity ploughing through a softer material.	[3]	2 3
Q.5(a)	Classify the different forms of wear.	[2]	3 2
Q.5(b)	Illustrate and explain two-body and three-body abrasion.	[3]	3 2

:::27/09/2023 M:::