

**BACHELOR OF TECHNOLOGY IN
MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)
B.Tech. (Aerospace Engineering)
(BTMEVI)**

Term-End Examination

December, 2012

BME-018 : ENGINEERING MATERIALS

Time : 3 Hours

Maximum Marks : 70

Note : Answer any five of the following questions. Use of Calculator is allowed.

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1. (a) Distinguish between ductile and brittle materials. Give examples for each of them. 4
 - (b) A steel wire having $\sigma_Y = 190 \text{ MPa}$ is required to have a modulus of resilience of $140 \times 10^{-6} \text{ N-M/m.m}^3$. The yield strength can be increased by strain hardening. What should be the % increase in yield strength $E = 210 \times 10^3 \text{ N/mm}^3$. 10
 2. (a) What is Mho's hardness scale? Why is it difficult to measure hardness of steel on Mho's scale? Explain. 7+7
 - (b) Explain how Brinell hardness and Vicker's hardness are similar. What is the difference in between two methods ?

3. (a) Describe BOF and its advantages. 7+7
(b) Distinguish between killed and semi-killed steels.
4. (a) Describe various materials used in manufacture of grinding wheels. 7+7
(b) Describe various methods of manufacturing ceramics.
5. (a) Differentiate between isostrain and isostress loading of a composites. State the conditions of stress and strain in two cases. 7+7
(b) Sketch and describe the process of Pultrusion.
6. (a) What is Griffith's criterion of fracture? Explain. 7+7
(b) Explain the existence of a small plastically deformed zone ahead of a crack tip.
7. (a) What are different methods of surface treatment? Explain any two of them in detail. 7+7
(b) Explain different types of mechanisms of lubrications.
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