

ITL 705 (Materials for tribological applications)
II Minor Exam 2014, 08/10/2014

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Time 1 hrs Marks 25

Q. I Answer followings

1. What could be the possible ways to protect the materials from degradation? (1)
2. What are characteristics of good bearing materials? (1)
3. Why soft metals are used in bearings? What is Babbitts? (1)
4. What is ceramics? Write their classifications? (1)
5. What is solid lubricant? How they can be applied to tribological? *Application* (1)
- did.* 6. Frictional heat affects the performance of friction materials. ? (1)
7. What are the important parameters for coatings under tribological contact? (1)
8. What is systematic approach for analysis for coatings under tribological contacts? (1)
9. What are the application of surface hardening? (1)
10. What are the materials for soft and hard coatings? (1)

Q.II Write short note on

(0.5x10 = 5)

1. White Cast Iron
2. Induction hardening
3. Carburizing
4. Nitriding
5. Alloying of copper
6. Tin bronzes
7. Leaded tin bronzes
8. Copper lead alloys
9. Beryllium copper
10. Aluminum Bronze

Q. III Differentiate between followings.

1. Metal matrix composites and Ceramic matrix composites. (1)
2. Particle reinforced composites and fiber reinforced composites. (1)
3. Soft coating on hard surface and hard coating on soft surface. (1)
4. Martempering and Austempering (1)
5. MoS_2 and hBN as solid lubricants (1)

Q. IV Explain why/How?

1. Spheroidizing improves machinability (1)
2. Scuffing of steel can be prevented by lead coatings (1)
3. Wear of rail-wheel tribo-pair under contact fatigue (1)
4. Zirconia is added to alumina based ceramics (1)
5. Multilayer and columnar coatings protects the surface (1)