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BME-050

DIPLOMA IN MECHANICAL ENGINEERING (DME)/DMEVI

Term-End Examination

December, 2015

BME-050 : ENGINEERING MATERIALS

Time : 2 hours *Maximum Marks : 70*

Note : *Question number **1** is **compulsory**. Attempt any **four** questions out of the remaining questions numbered 2 to 6. Use of calculator is permitted.*

1. Define any ***seven*** of the following : *7×2=14*

(a) Toughness

(b) Elastic limit and Proportional limit in ductile materials

(c) Charpy Impact Test

(d) Continuous Casting

(e) Plain carbon steels and its applications

(f) Tempering

(g) Age-Hardening of Aluminium Alloys

(h) Refractoriness

(i) Natural Polymers

2. (a) Distinguish between proportional limit and elastic limit. Which one is higher in stress – strain diagram obtained from tensile test of a mild steel specimen ?

(b) A steel specimen of 12 mm diameter and 60 mm gauge length was tested in tension and the following observations were recorded :

Load at upper yield point = 20900 N

Load at lower yield point = 19850 N

Maximum load = 36000 N

Gauge length after fracture = 63 mm

Calculate the modulus of resilience, modulus of toughness and % of elongation, if $E = 210 \times 10^3$ N/mm^2. *2×7=14*

3. (a) Distinguish between killed and semi-killed steels.

(b) Explain Annealing process. *2×7=14*

4. (a) Describe the following phases in iron-carbon phase diagram :

(i) Pearlite

(ii) Ferrite

(iii) Cementite

(iv) Austentite

(v) Leduberite

(b) What is quenching ? Why should quenched steel be tempered ? Discuss. *2×7=14*

5. (a) Describe the properties and uses of carborundum.

(b) Describe different methods of manufacturing ceramics. *2×7=14*

6. (a) What are the advantages and limitations of adhesive bonded joints ?

(b) What are the different types of mechanical cleaning processes used for the cleaning of casting ? *2×7=14*