

**DIPLOMA - VIEP - MECHANICAL
ENGINEERING (DMEVI)**

00706 Term-End Examination

June, 2015

BIME-024 : ENGINEERING METALLURGY

Time : 2 hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

1. (a) What are crystallographic planes and crystallographic directions ? Describe their significance. 7
- (b) How does the presence of dislocation affect the plastic deformation and strength of metals ? Describe. 7
2. (a) Define the following phases : 7
Austenite, Ferrite, Pearlite, Cementite and Martensite.
- (b) Describe the effect of P, S, Si, Mn, Mo and C on the properties of steels. 7
3. (a) What are Stainless Steels ? Why are they called so ? Give their broad classification and applications. 7
- (b) How are aluminium alloys classified ? Explain and mention their properties and applications. 7

4. (a) How does the concentration of carbon affect the hardenability of steels? Describe. 5
- (b) Explain the procedure for hardening of high carbon steel. 5
- (c) Briefly describe the role of quenching medium during hardening. 4
5. (a) Explain hot isostatic pressing. Give its major applications. 7
- (b) Briefly discuss the various processes/operations involved in powder metallurgy. 7
6. (a) Briefly describe the use of eddy currents in the detection of flaws in metallic parts. Give its limitations. 7
- (b) Briefly discuss the ultrasonic testing used in inspection. 7
7. Write short notes on any **four** of the following: $4 \times 3 \frac{1}{2} = 14$
- (a) Hot Working vs Cold Working
- (b) Iron-Carbide Equilibrium Diagram
- (c) Bearing Materials
- (d) Nitriding
- (e) Refractory Materials
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