

QP CODE : 555600

(3 Hours)

[Total Marks : 80

- N. B. 1) Question No. 1 is compulsory.
2) Attempt any three questions from remaining five questions.
3) Figures at right indicate marks.
4) Draw neat well labeled sketches.
- Q. 1 Write note on any four:- (5x4=20)
a) Thermal fatigue of metal
b) Andrade's analysis of classical creep curve
c) Effect of Alloy on Eutectoid temperature and composition
d) Critical resolved shear stress
e) Dislocation Interaction
- Q. 2 A) What do you mean by Nano-materials? Explain their properties (10)
and practical applications.
B) What is Fatigue? Explain fatigue testing in detail. (10)
- Q. 3 A) Draw Fe-Fe₃C Diagram and Explain cooling of 0.9 % C alloy in (10)
the Fe-Fe₃C Diagram.
B) What is the difference between case hardening and surface (10)
hardening? Explain pack carburizing.
- Q. 4 A) Draw and explain construction of Time Temperature (10)
Transformation (TTT) diagrams of 0.8 % C alloy.
B) Derive an expression for Griffith theory of brittle fracture. Explain (10)
Orowan's Modification.
- Q. 5 A) What is plastic deformation? Distinguish between slip and twin (10)
mechanism of plastic deformation.
B) Classify crystal Imperfections. Distinguish between Edge and (10)
Screw dislocation.
- Q. 6 Write short note on any four (5x4=20)
a) Composite materials
b) Ausforming
c) Yield point phenomenon
d) Hardenability test
e) Normalizing