

58

JAYA GROUP OF INSTITUTIONS-THIRUNINRAVUR  
6<sup>th</sup> SEM – B.E. / B.Tech  
INTERNAL ASSESSMENT-1(MODEL EXAM-1)

Sub. Name: High Temperature Materials  
Sub. Code: AE 2354  
Duration: 180 minutes

Date: 30-01-2015  
Branch: Aeronautical  
Max.Marks: 100

**PART-A (10x2=20)**

1. Define creep
2. Define slip and climb.
3. What are the factors influencing functional life of components at elevated temperature?
4. What are the problems associated with materials used at elevated temperature?
5. What is edge dislocation?
6. Which types of materials are preferred for creep application?
7. Draw a typical creep curve and mark the various stages.
8. Write any two high creep resistance materials.
9. What are Material aspects for creep resistance?
10. Distinguish between Ductile material and brittle material.

**PART-B (5x16=80)**

- 11.a) (i) What are the structural changes involved during creep? Explain in detail. (8)  
(ii) Briefly explain the three steps of creep with a creep curve.(8)

(OR)

b) It is well known that the functional life time of material put into service at high temperature are subjected to three dimensional damages by way of creep, corrosion and micro structural changes. For each type write on the various damage mechanisms and the method to combat them. (16)

- 12.a) Discuss the mechanism of creep deformation briefly with necessary sketches.(16)

(OR)

b) It is well known that at high temperature materials are subjected to creep corrosion and micro structural changes. Analyse each of the things in limiting functional life on components.(16)

13.a) Explain in detail about the factors influencing functional life of components at elevated temperatures.(16)

(OR)

b) List out the metallurgical factors influencing various stages of creep using a suitable diagram, explain these stages. (16)

14.a) (i) Briefly explain the influence of brittle and ductile materials on creep.(8)

(ii) Discuss the conditions favorable for creep cavitation. (8)

(OR)

b) i) Explain Monkman-Grant Relationship(8)

ii) Derive the various methods adopted in representing rupture life of creep(8).

15.a) Briefly explain the Mechanism of Hardening (16)

(OR)

b) (i) How will you obtain creep resistance through strain hardening? (8)

(ii) Explain stress rupture test at elevated temperature.(8)

62m  
year  
mod  
TII / Aero

AERO