

B.E. (Aeronautical Engineering) Eighth Semester (C.B.S.)

Elective-III : Fatigue & Fracture

P. Pages : 2

Time : Three Hours



NRT/KS/19/3736

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) Explain the relation between stress & life (S -N diagram) for any two materials with neat sketch. 7
b) Explain Soderberg line, Goodman line and Gerber parabola. 6

OR

2. a) What are the different methods to reduce stress concentration. 7
b) Differentiate between Neuber's and plastic stress concentration factor. 6
3. a) What do you understand by low cycle & high cycle fatigue. 6
b) Derive an expression for Manson's relation. 7

OR

4. a) Write short note on cyclic strain hardening & softening. 6
b) What are the different cycle counting techniques? Explain any one technique. 7
5. a) What is mean by fatigue life? Explain different phases in the fatigue life. 7
b) With the help of neat sketch. Explain crack initiation & propagation in metals. 7

OR

6. a) Explain the phenomenon of crack growth / crack propagation. 7
b) What is the influence of stress and temperature on creep behavior. 7
7. a) Explain the term potential energy & surface energy. 6

- b) Derive expression for Griffith's theory for ductile material. 7

OR

8. a) What are the effect of thickness on fracture toughness. 7
b) Write short note on intensity factors for typical geometrics. 6
9. a) State the different philosophies for safe design. 7
b) Which factors are consider for safe design. 6

OR

10. a) What is the importance of fracture mechanism in aerospace structure. 7
b) Explain the different application of aircraft materials & structures. 6
11. a) What are different components of propulsion system are induced in fatigue & facture. 7
b) Discuss the any one case study regarding fatigue & fracture included in all components. 7

OR

12. a) What is the effect of fatigue and fracture in aircraft structure. 7
b) Explain the different parameters and errors occure due to fatigue and fracture in landing gears. 7
