

**Reg. No:**

--	--	--	--	--	--	--	--	--

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year I Semester Regular & Supplementary Examinations Nov/Dec 2019**  
**DESIGN OF MACHINE ELEMENTS-I**  
**(Mechanical Engineering)**

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)**UNIT-I**

- 1 a Explain the general design procedure while designing a machine element. **7M**  
b What is meant by factor of safety? Explain how it can be used in design applications. **5M**
- OR**
- 2 a Derive an expression for the impact stress induced due to a falling load. **6M**  
b How do you classify materials for engineering use? **6M**

**UNIT-II**

- 3 a Discuss the factors affecting endurance limit. **6M**  
b Define the terms: (a) Notch sensitivity (b) fatigue stress concentration factor. **6M**
- OR**
- 4 a Determine the diameter of a circular rod made of ductile material with a fatigue strength (complete reversal),  $\sigma_e=265$  MPa and tensile yield strength of 350 MPa. The member is subjected to a varying axial load from  $W_{\min} = -300$  KN to  $W_{\max} = 700$  KN and has a stress concentration factor is 1.8. Use factor of safety as 2. **8M**  
b Theoretical stress concentration factor. **4M**

**UNIT-III**

- 5 a Explain briefly the method of riveting. **6M**  
b What is the difference between caulking and fullering? Explain with the help of neat sketches. **6M**
- OR**
- 6 a Write advantages and disadvantages of welded joint over riveted joints. **4M**  
b Discuss the standard location of elements of a welding symbol. **8M**

**UNIT-IV**

- 7 a How the shaft is designed when it is subjected to twisting moment only? **8M**  
b What are the applications of a cotter joint? **4M**
- OR**
- 8 a What type of stresses is induced in shafts? **6M**  
b A solid shaft is transmitting 1 MW at 240 r.p.m. Determine the diameter of the shaft if the maximum torque transmitted exceeds the mean torque by 20%. Take the maximum allowable shear stress as 60 MPa. **6M**

**UNIT-V**

- 9 a What is a key? State its function with neat sketch. **6M**  
b Draw the neat sketch of Sunk key, Saddle key and its applications. **6M**
- OR**
- 10 a Draw neat sketch of sleeve coupling and its application. **6M**  
b State the function of key way and splines. **6M**

\*\*\* END \*\*\*