GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER- III• EXAMINATION – SUMMER 2015

| Su | bject | Date: 03/06/2015 | | |
|-----|------------|------------------------------------|-----------------------|----|
| Su | bject | Name: Machine Design & | & Industrial Drafting | |
| Ti | me:0 | Total Marks: 70 | | |
| Ins | tructio | ons: | | |
| | 1. | Attempt all questions. | | |
| | 2. | Make suitable assumptions wh | nerever necessary. | |
| | 3. | . Figures to the right indicate fu | ll marks. | |
| Q.1 | (a) | Define following terms: | | 07 |
| • | | 1. Creep | 2. Plasticity | |
| | | 3. Hardness | 4. Fatigue | |
| | | 5. Resilience | 6. Malleability | |
| | | 7. Toughness | - | |
| | (b) | Discuss various stress relieving | es. 07 | |

- Q.2 (a) Explain the failures of riveted joint with neat sketch. 07
 - (b) A plate 75 mm wide and 12.5 mm thick is joined with another plate by a single transverse weld and a double parallel fillet weld as shown in Fig. 1. The maximum tensile and shear stresses are 70 MPa and 56 MPa respectively. Find the length of each parallel fillet weld, if the joint is subjected to both static and fatigue loading.



(b) Discuss the design procedure for spigot & socket cotter joint.

07

- Q.3 (a) What is a key? How the keys are classified? Discuss the stresses subjected to key 07 failure.
 - (b) A solid circular shaft is subjected to a bending moment of 2800 N-m and a torque of 9000 N-m. the allowable tensile stress for shaft material is 110 MPa and allowable shear stress of 80 MPa. Determine the diameter of the shaft.

OR

Q.3 (a) Classify the shaft couplings. Explain the design procedure for protective type 07 flange coupling.

| | (b) | Explain Oldham Coupling with the help of neat sketch. | | | |
|-----|---|--|----------|--|--|
| Q.4 | (a) (b) | Explain the design procedure for hand lever. A foot lever is 1 m from the centre of shaft to the point of application of 800 N load. Find : Diameter of the shaft, Dimensions of the key, and Dimensions of rectangular arm of the foot lever at 60 mm from the centre of shaft assuming width of the arm as 3 times thickness. The allowable tensile stress may be taken as 73 MPa and allowable shear stress as 70 MPa. Assume suitable data if required. | 07 07 | | |
| Q.4 | (a) Explain different screw threads with neat sketches. (b) Explain design procedure for toggle jack | | 07 07 | | |
| Q.5 | (a) (b) | Differentiate shaft and axle. Design the shaft when it is subjected to bending moment only. What is fit? Explain different types of fits with neat sketch. | 07 07 | | |
| | OR | | | | |
| Q.5 | (a) | Explain following AutoCAD command with example: (Any FOUR) 1. Rotate 2. Base line diameter 3. Offset 4. Trim 5. Circle | 07 | | |
| | (b) | Explain creating and modifying 3D objects using AutoCAD. | 07 | | |
