

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2018

Subject Code:2141907

Date:10/12/2018

Subject Name:Machine Design & Industrial Drafting

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) What is the difference between Drawing, Drafting and Design?	03
	(b) Define limits, fits and tolerance.	04
	(c) In a hub and pin assembly, the lower and upper limits on the inner diameter of the hub are 40.000mm and 40.021 mm respectively, while the lower and upper limits on the diameter of pin are 40.028 and 40.041mm respectively. Determine (i) The tolerance on hub diameter; (ii) The tolerance on pin diameter; and (iii) The allowance. With the figure state the type of the fit of the assembly.	07
Q.2	(a) What is key? What are the different types of key	03
	(b) What are the requirements of good couplings?	04
	(c) Design a cast iron protective type flange coupling to transmit 15 kW power at 900 r.p.m from an electric motor to a compressor. The service factor may be assumed as 1.7. The permissible stresses are as follows 1. Shear stress for shaft, bolt and key = 40 MPa 2. Crushing stress for bolt and key = 80 MPa 3. Shear stress for cast iron flange = 8 MPa Standard shaft diameters are: 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 Take number of bolts as 3.	07
	OR	
	(c) Draw and design a bushed pin type flexible coupling.	07
Q.3	(a) Define cotter. Why taper is provided on a cotter?	03
	(b) What is lever? What are the different types of lever?	04
	(c) Briefly explain the general procedure for lever design.	07
	OR	
Q.3	(a) Define factor of safety.	03
	(b) Determine the principal stresses for a 35mm diameter rod, supported at one end as a cantilever, subjected to an axial compressive load 15 kN and a twisting moment 250 N-m	04
	(c) Design a knuckle joint to connect two circular mild steel rods which are subjected to a tensile load of 63kN. The allowable stresses are: 80MPa in tension, 56 MPa in shear and 80MPa in crushing.	07

