

## **ME 322 Machine Design**

### **Assignment 6 (Set 4)**

**Submission Date: 19/04/22**

1. Write a short note on failure of bearings.
2. Differentiate between grease and lubricating oils.
3. What are the precautions to be taken during the mounting of rolling contact bearings?
4. What are the different methods used for preloading of cylindrical roller bearings?
5. Explain the ISO plan for the dimension series of the bearing having bore diameter of 75 mm.
6. Write the advantages of needle bearings.
7. Explain Pitting and scoring in bearings.
8. Write about different types of fits used in design of bearings.
9. Derive the expression for dynamic load capacity of ball bearings under varying loads and speeds.
10. Write a short note on selection of taper roller bearings.
11. A single row deep groove ball bearing is used to support the lay shaft of a four-speed automobile gearbox. It is subjected to loads in respective ratios as shown in table. The lay shaft is fixed to the engine-shaft and rotates at 1800rpm. The static and dynamic load carrying capacities of the bearing are 10900 N and 17600 N respectively. The bearing is expected to be in use for 4000 hours of operation. Find out the reliability with which the life could be expected.

Gear	Axial Load (N)	Radial Load (N)	% time engaged
First	3250	4000	3%
Second	500	2750	7%
Third	50	2750	25%
Fourth	Nil	2750	65%

12. A ball bearing is operating on a work-cycle consisting of three parts - a radial load of 3000 N at 1440 rpm for one quarter cycle, a radial load of 5000 N at 720 rpm for one third cycle and radial load of 2500 N at 1440 rpm for the remaining cycle. The expected life of the bearing is 10000 hr. Calculate the dynamic load carrying capacity of the bearing.