## ME 322 Machine Design

## Assignment 6 (Set 2) Submission Date:19/04/22

1. What is reliability of bearings? Explain its relation with bearing life.
2. Explain Pitting and scoring in bearings.
3. Write a short note on mounting of bearings.
4. Explain the ISO plan for the dimension series of the bearing having bore diameter of 55 mm.
5. Write a short note on failure of bearings.
6. Differentiate between grease and lubricating oils.
7. Write about mounting of bearings.
8. Derive the expression for dynamic load capacity of ball bearings under varying loads and speeds.
9. Write some applications of needle bearings.
10. Write a short note on selection of tapper 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 15900 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.

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| --- | --- | --- | --- |
| Gear | Axial Load (N) | Radial Load (N) | % time engaged |
| First | 3250 | 4000 | 1% |
| Second | 500 | 2750 | 5% |
| Third | 50 | 2750 | 24% |
| Fourth | Nil | Nil | 70% |

1. In a particular rolling element bearing operation, the life of bearings, L in number of revolutions and the radial load, R are related by the expression, RL (1/p)= K, where K and p are constants. It withstands a radial load of 2 kN for a life of 540 million revolutions. Find the load for a life of 1 mil revolutions in case of roller bearing.