

ASSIGNMENT NO.1

1. Explain McKee brother's relation and also find out the expression for coefficient of friction.
2. What do you mean by bearing? Explain in Detail.
3. Design a journal bearing for a centrifugal pump from following data:
Load on bearing=20KN; Speed of journal=900r.p.m;
Absolute viscosity at 55°=0.017kg/m-s; Ambient temp. Of oil=15.5°
Maximum bearing pressure for pump =1.5N/mm².
Calculate also the mass of lubricating oil required for artificial cooling. If rise in temp. of oil be limited to 10°C. Heat dissipation coefficient=1232W/m²/°C.
4. A bronze spur pinion rotating at 600 r.p.m drives a cast iron spur gear at a transmission ratio 4:1.The allowable static stresses for the bronze pinion and cast iron gear are 84MPa and 105MPa respectively. The pinion has 16 standard 20° full depths in involute teeth of module 8mm. The face width of both gears is 90mm. Find the power that can be transmitted from the standpoint of strength.
5. A pair of helical gears is to transmit 15KW. The teeth are 20° stubs in diametral plane and have an helix angle of 45°. The pinion runs at 10000rpm and has 320mm pitch dia. If gears are made of cast steel having allowable static strength of 100MPa; determine suitable module and face width from static strength and wear consideration. Endurance strength is 618MPa
6. What do you mean by ANTI FRICTION bearing? Explain in Detail.
7. Explain different types of sliding contact bearing.
8. The load on journal bearing is 150KN due to turbine shaft of 300dia running at 1800 rpm. Determine length of bearing if max. Pressure is 1.6 N/mm².also find out heat generated if bearing temp. is 60° and viscosity of the oil at 60°is 0.02kg/m-s and bearing clearance is 0.25 mm.
9. A shaft rotating at constant speed is subjected to variable load .The bearing supporting the shaft are subjected to stationary equivalent radial load of 3KN for 10% of time, 2KNfor 20% of time, 1KNfor 30% of time, no load for remaining time of cycle .If total life expected for the bearing is 20*10⁶ revolution at 95% reliability, calculate dynamic load rating of the ball bearing.
10. A bronze spur pinion rotating at 600 r.p.m drives a cast iron spur gear at a transmission ratio 4:1.The allowable static stresses for the bronze pinion and cast iron gear are 84MPa and 105MPa respectively. The pinion has 16 standard 20° full depths in involute teeth of module 8mm. The face width of both gears is 90mm. Find the power that can be transmitted from the standpoint of strength.
11. Helical cast steel with 30°helix angle has to transmit 35KW at 1500rpm. If gear has 24 teeth, determine the module, pitch dia. And **face width** for 20° full depth teeth. The static stress for cast steel may be taken as 56MPa. The face width may be taken as 3 times of normal pitch. What would be the end thrust on the gear?
12. Design Procedure for Spur gear.
13. Explain Design Procedure for Helical gear.
14. Write short on
 1. Lewis equation
 2. Buckingham equation
 3. Wear load consideration