SHAMBHUNATH INSTITUTE OF TECHNOLOGY, ALLAHABAD

MECHANICAL ENGINEERING DEPARTMENT

**ASSIGNMENT OF MACHNINE DESIGN-2 (**Last Date 29.02.2016)

Q1. What is virtual or formative gear? Analyze the forces on Helical gears. (2013)

Q2. With the help of neat sketch , explain how an axial thrust is generated in a helical gear. (2006)

Q3. What are the disadvantages of spur gear, how these difficulties are overcome in helical gears.

Q4. A helical cast steel gear with 300 helix angle has to transmit 35kW at 1500rpm.if gear has 24 teeth, find the necessary module, pitch diameter, and face width for 200 full depth teeth. The static stress for cast steel is 56MPa. The width of face may be taken as 3 times the normal pitch. What would be the end thrust on gear. (2014)

Q5. A pair of helical gear transmits 5kW, Teeth on pinion and gear is 25 and 50.Normal module is 4mm, Helix angle 200 , normal pressure angle is 200 . Determine the axial , Tangential and Radial components of tooth load If pinion rotates at 1200rpm. (2013)

Q6. A pair of helical gears consists of 25 teeth pinion meshing with 100 teeth gear. Normal pressure angle is 200 and helix angle 250 , The pinion rotates at 740rpm. Normal module of gear is 5mm and face width is 50mm. Both pinion and gear are made of steel with allowable bending strength of 330MPa. Gears are heat treated to a surface hardness of 380BHN. What power that can be transmitted by the gears if service factor is 1.3? Assume velocity factor suitably. (2013)

Q7.Two prcision cut forged steel helical gears have 250 full depth involute teeth. The helix angle is 230 and permissible static bending stress is 100MPa. If gear ratio is 3:1, module is 3 mm, face width is 300mm, and surface endurance strength is 630 MPa, Find the power transmitted and wear load, state wether the design is safe? The pinion rotates at 600rpm.

Q8. A pair of parallel helical gears made of 20 teeth pinion meshing with a 100 teeth gear. The pinion rotates at 720 r.p.m. The normal pressure angle is 200 and helix angle is 250 . The face width is 40mm while the normal module is 4mm. The pinion as well as gear are made of plain carbon steel with an ultimate tensile strength of 600N/mm2 . The gear pair is heat treated to a surface hardness of 300 BHN. If the service factor and factor of safety are 1.5 and 2.0 respectively. Determine the power rating of the gear pair and design gear pair. (2010)

Q9. Design a pair of helical gears of equal diameter, 200 stub tooth helical gears to transmit 40 kW power with moderate shock at 1200r.p.m. The two shaft are parallel and 45cm apart. Find module and face width of the teeth. (2009)

Q10. A pair of helical gears are used tp transmit 15kW at 3000r.p.m. of pinion. The teeth are 200 stub in diametral plane and the helix angle is 450 .The gear and pinion have a pitch diameters of 320mm and 80mm respectively. Both gear and pinion are made of cast steel with an allowable stress of 100MPa. The modulus of elasticity for cast steel is 2x105MPa. and its surface endurance strength is 618MPa. Suggest a suitable module and face width for gear pair and check for wear. (2007 and 2008)