

SSM COLLEGE OF ENGINEERING AND TECHNOLOGY

SUB: MACHINE DESIGN

SEM:6TH

BRANCH: MECHANICAL

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UNIT I

TOPIC: BEARINGS-- RECOMMENDED BOOK: SHARMA AGARWAL & R S KHURMI

Q1: Introduction of bearing and classification of bearing.

(Chapter 26 R S KHURMI 14TH Edition)

Q2: Journal bearing Design

Q3: Hydrodynamic Journal Bearing. Terms used in journal bearing.

Q3: Bearing characteristic number and bearing modulus for journal bearing.

Q4: Design a journal bearing for a centrifugal pump from the following data:

Load on journal =20000N, Speed of journal=900rpm, absolute velocity at 55°C=0.017kg/ms. Ambient temperature of oil=15. 5°C.Maximum bearing pressure for the pump=1.5N\mm².Calculate also mass of the lubricating oil required for artificial cooling, if rise of temperature be limited to 10°C.Heat dissipation coefficient =1232W/m²/°C. (Solved example No. 26.1, R S KHURMI)

Q5: Design a journal bearing to support a load of 4500N at 600rpm using a hardened steel journal and a bronze backed Babbitt bearing. The bearing is lubricated by oil rings. take room temperature as 21°C and the oil temperature as 80°C. (Ex. NO. 17.2, Sharma Agarwal 11th Edition)

Q6:A 80mm long journal bearing supports a load of 2800N on a 50mm diameter shaft. The bearing has a radial clearance of 0.05mm and the viscosity of the oil is 0.021kg\ms at the operating temperature. If the bearing is capable of dissipating 80J\s, determine the maximum safe speed. (EX. No.26.5 R S KHURMI)

(DO SIMILAR QUESTIONS FOR PRACTICE)

Q7: Rolling contact bearings. Advantages and disadvantages of rolling contact bearings over sliding contact bearing...(R S KHURMI)

Q7: Types of Rolling Contact Bearing. Standard Dimensions and designation of Ball Bearings.

Q8: Basic static load rating of Rolling Contact Bearing and Static equivalent load for Rolling Contact Bearing.

Q8: Life of a Bearing.

Q9: Comparison of Ball and Roller Bearings.

Q10: A bearing is required to carry 4500N stationary radial load. The shaft rotates at 1000rpm and life desired is 30000hrs.the running conditions are steady, no shock loading Select a suitable Bearing. (Ex No. 17.17 AGARWAL)

Q11: A bearing is required for a 35mm shaft .it is to operate for 8 hrs. per day ,5 days per week for 5 years and is to carry a stationary radial load of 2250N at 1500rpm, inner ring rotating. There is a possibility of light shock. Select a suitable bearing,(Ex No. 17.18 AGARWAL)

Q12: A radial ball bearing has a basic load rating of 50KN.If the desired rating life of the bearing is 6000hrs, what equivalent radial load can the bearing carry at 500rpm.(Ex No. 17.20 AGARWAL)

Q13: For a radial ball bearing, the desired rated life is 10000hrs for a speed of 600rpm and radial load of 5KN. Find the basic load rating for the bearing.(Ex No. 17.21 AGARWAL)

Q15: Select a suitable ball bearing to carry a radial load of 10000N and an axial load of 4000N.the shaft rotates at 1000rpm.average life is 5000hrs.Inner race rotates. Take mild shock.(Ex No. 17.23 AGARWAL)

UNIT II

TOPIC: Design of Gears Recommendedbook: Machine Design by R L Mott

Q1: Introduction to Gear Design.

Q2: Introduction to various terms used in Gear nomenclature

Q3: Design analysis for Spur Gear

Q4: Design analysis for Helical Gear

Q5: Design analysis for Bevel Gear.

Q6: Designanalysis for Worm Gear.

Q7: Do solved numerical on the above mentioned topics of R L MOTT

TOPIC: BRAKES RECOMENDED BOOK (R S KHURMI & SHARMA AGARWAL)

Q1: INTRODUCTION TO BRAKES. ... (CHAPTER 25 OF MACHINE DESIGN BY RS KHURMI)

Q2: How does the function of a brake differ from that of a clutch.

Q3: Type of brakes (brief introduction)

Q4: Study in detail SINGLE BLOCK OR SHOE BRAKE, PIVOTED BLOCK OR SHOE BRAKE, DOUBLE BLOCK OR SHOE BRAKE

Q7: NUMERICALS.... (QNO.25.2,25.3,25.4,25.6)KHURMI ...CHAPTER:25...EDITION:14TH

Q8: NUMERICALS ...(SHARMA AGARWAL 11TH EDITION)...EXAMPLE NO.18.12,18.13,UNSOLVED 34.

TOPIC: CLUTCHES..... RECOMMENDED BOOK (SHARMA AGARWAL & RS KHURMI)

Q1: Function of clutches(chapter 24,R S khurmi)

Q2: Type of clutches (POSITIVE CLUTCHES & FRICTION CLUTCHES)

Q3: Design of a Disc or Plate clutch.

Q4: Multiple Disc Clutch .

Q6: solved example 24.1 & 24.2 ...(Khurmi)

Q7: Design of a CONE CLUTCH. (page no. 903 khurmi 14th edition)

Q8: Solved Example NO. 24.12

Q9: Design of a centrifugal clutch

Q10.Solved Example 24.14

Q11: Solved Numerical –SHARMA AGARWAL(page no. 604: Example NO. 18.4 to 18.11)

TOPIC: CHAIN DRIVESR S KHURMI

Q1: Introduction. Advantages and disadvantages of Chain Drives (chapter no.21)

Q2: Design procedure of Chain Drive (page no. 773)

Q3: Solved Example 21.1

TOPIC: KEYS AND COUPLINGS ...(R S KHURMI CHAPTER NO. 13)

Q1: INTRODUCTION

Q2: Types of keys (saddle keys, tangent keys, round keys, splines)

Q3: Forces acting and Strength of a SUNK KEY.

Q4: Solved Example 13.1,13.2, 13.3

Q5: Shaft coupling. Types of shaft coupling.

Q6: Sleeve or Muff coupling and do solved example no.13.4

Q7: Clamp coupling and do solved example no.13.5

Q8: Flange coupling. Design of flange coupling. Do example no. 13.6,13.7,13.8

TOPIC: FLAT BELT DRIVES (R S KHURMI)

Q1: Introduction and types of Flat Belt Drives. (chapter 18)

Q2: Design of Flat Belt drives

Q3: Solved Example no.18.3 &18.4

TOPIC: FLAT BELT PULLEYS..... (Chapter 19 R S KHURMI)

Q1: TYPE OF PULLEYS FOR FLAT BELTS

Q2: Design of Cast Iron Pulleys

TOPIC: V BELT(CHAPTER 20 R S KHURMI)

Q1: Introduction and types of V Belts and Pulleys.

Q2: Solved Example 20.2

