PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION – JAN 2023

Course Code: MEC 219

Course Name: Design of Machine Elements - II

Program : B. Tech. (Mechanical Engg.)

Date: 24-JAN-2023

Time: 9:30am to 12:30pm

Max Marks: 100

Weightage: 50%

Instructions:

(i) Read the all questions carefully and answer accordingly.
(ii) Use of Design Data Hand book permitted
(iii) Use of Scientific Calculator permitted.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries 5 marks. **(5Qx5M= 25M)**

1. Enlist any 2 advantages and disadvantages of Chain Drives. (C. O. No.1) [Knowledge]
2. Identify the different types of springs with diagram (C. O. No.2) [Knowledge]
3. Describe the Law of Gearing. (C. O. No.3) [Knowledge]
4. Define Clutch. Identify the advantages and disadvantages of a positive clutch.
(C. O. No.4) [Knowledge]
5. Enlist any three properties of Lubricants (C. O. No.5) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries 10 marks. **(3Qx10M=30M)**

5. Volvo Eicher wants to conduct the study of belt tension ratios in Belt drives Design. As An Engineer suggest and derive the suitable relation for ratio.

(C. O. No.1) [Comprehension]

6. A car crash test spring is drop tested as a chunk of metal weighing 1kN load is suddenly dropped on it from a height of 250mm. the spring has 20 turns and has a wire diameter of 20mm. Assuming spring index of 8 & Modulus of rigidity of 84 GPa. Predict the deflection experienced by the spring.

(C. O. No.2) [Comprehension]

7. Asia Motor Works (AMW) is a Heavy Commercial Manufacturing Company having manufacturing plant at Gandhidham, Bhuj. The company wants to re look into the clutch design procedures. As an Engineer suggest the criterions used for clutch design to AMW and explain any one with procedure

(C. O. No.4) [Application]

Part C [Problem Solving Questions]

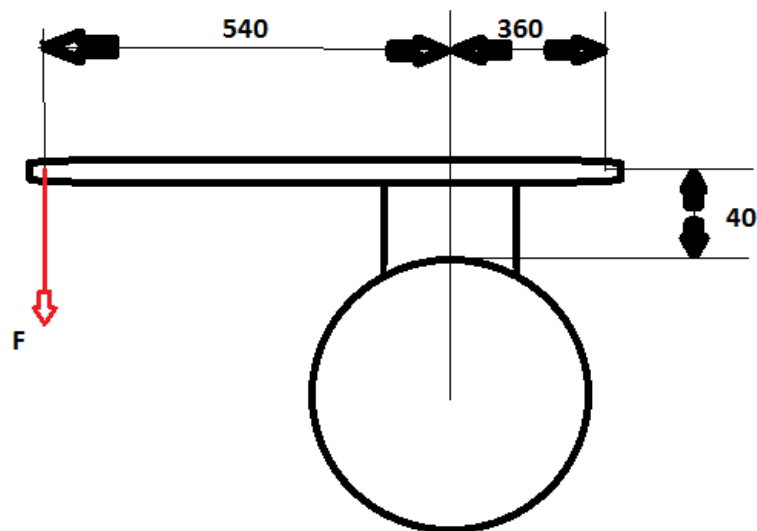**Answer all the Questions. Each question carries 15 marks.**   **(3Qx15M=45M)**

8. Design a pair of steel straight toothed gears to transmit 12 kW between parallel non-intersecting shafts at 1200 rpm of pinion. The velocity ratio required is 4:1. The pitch line velocity of gears is not to exceed 12 m/s.

(C. O. No.3) [Application]

9. A single plate clutch is used to connect or disconnect a machine to the source of 30 kW power running at 1200 rpm. The outer diameter of the friction lining used in clutch is 1.5 times the inner diameter. The friction lining material is woven asbestos and opposing plate material is steel. The shaft is made up of C40 steel having yield point strength 324 MPa and take fos= 2.5 Determine some of the main design parameters considering uniform wear criteria.

(C. O. No.4) [Application]

10. A shoe brake is used to stop a drum which receives 23.5 kW of power at 1000rpm. Diameter of brake drum is 720mm and the friction material is asbestos. Illustrate whether the brake will self-lock or not.

(C. O. No.4) [Application]