



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

Accredited by NAAC-UGC with 'A++' Grade (Cycle III) &

Accredited by NBA (B.E - CSE, EEE, ECE, Mech & B.Tech.IT)

COIMBATORE-641 035, TAMIL NADU



Reg. No:

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B.E/B.Tech- Internal Assessment – III
Academic Year 2024-2025 (Even Semester)
Sixth Semester

Mechanical Engineering

19MET303 – DESIGN OF TRANSMISSION SYSTEMS

Time: 1^{1/2} Hours

Maximum Marks: 50

Answer All Questions

B

CO Blooms

- | | | |
|---|-----|-----|
| 1. Define Progression Ratio | CO4 | REM |
| 2. Select the spindles for the 12 speed between 50 rpm to 600 rpm | CO4 | ANA |
| 3. List out the methods for changing speeds in gear box | CO4 | REM |
| 4. Compare brake and clutch | CO5 | ANA |
| 5. List out the functions of a clutch | CO5 | REM |

PART – B (2*13=26 Marks) & (1*14=14 Marks)

CO Blooms

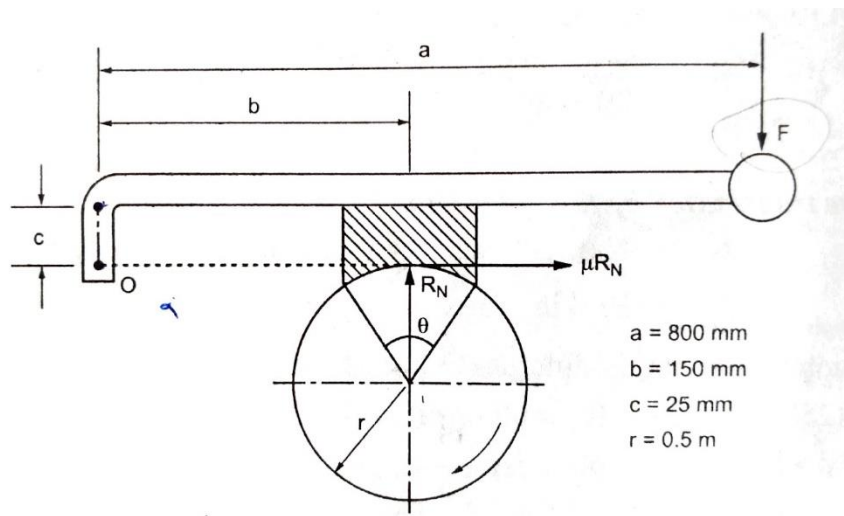
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|--|----|-----|-----|
| 6. (a) A nine-speed gear box, used as a head stock gear box of a turret lathe, is to provide a speed range of 180 r.p.m. to 1800 r.p.m. Using standard step ratio, draw the speed diagram, and the kinematic layout. | 13 | CO4 | ANA |
| (OR) | | | |
| (b) A six speed gear box is to provide a speed range of 100 rpm to 1000 rpm. Draw the speed diagram & kinematic layout of the gear box. | 13 | CO4 | ANA |
| 7. (a) A centrifugal clutch is to transmit 12 kW at 800 r.p.m. The shoes are four in number. The speed at which the engagement begins is $\frac{3}{4}$ th of the running speed The inside radius of the pulley rim is 180 mm and the centre of gravity of the shoe lies at 140 mm from the centre of the spider. The shoes are lined with Ferrodo for which the coefficient of friction may be taken as 0.35. Determine 1. Mass of the shoes, and 2. Size of the shoes, if angle subtended by the shoes at the centre of the spider is 70° and the pressure exerted on the shoes is 0.3 N/mm ² . | 13 | CO5 | ANA |

(OR)

- (b) An automotive single plate clutch consists of two pairs of contacting surfaces. The inner and outer radii of friction plate are 120 mm and 250 mm respectively. The coefficient of friction is 0.25 and the total axial force is 15 kN. Calculate the power transmitting capacity of the clutch plate at 500 r.p.m. using (i) Uniform wear theory, and (ii) Uniform pressure theory. 13 CO5 ANA
8. (a) Sketch the speed diagram and the kinematic layout for an 18 speed gear box for the following data : 14 CO4 ANA
 Motor speed = 1440 r.p.m.
 Minimum output speed = 16 r.p.m.
 Maximum output speed = 800 r.p.m.
 Arrangement = $2 \times 3 \times 3$.
 List the speeds of all the shafts when the output speed is 16 r.p.m.

(OR)

- (b) The diameter of the brake drum of a single block shown in Fig. 11.5 is 1 m. It sustains 240 N-m of torque at 400 r.p.m. The coefficient of friction is 0.32 Determine the required force to be applied when the rotation of the drum is (a) clockwise, (b) counter clockwise, and the angle of contact (i) 35° , and (ii) 100° . Given that $a = 800$ mm, $b = 150$ mm and $c = 25$ mm. Also find the new values of 'c' for self locking of the brake. 14 CO5 ANA

**Bloom's Taxonomy:**

REM – Remember **UND** – Understand **APP**– Apply **ANA**– Analyze **EVA** - Evaluate

CRT - Create

Faculty in-charge

Teaching Coordinator

HoD /Mech