Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

Course Code: AU411

Course Name: ENGINE AND DRIVELINE DESIGN

Max. Marks: 100   Duration: 3 Hours

Assume any missing data. Data book mentioned in syllabus is allowed

PART A

Answer any two full questions, each carries 15 marks.   Marks

1. Design a cast iron piston for a single acting four stroke for the following data   (15)

    Cylinder bore=100mm

    Stroke=125mm

    Maximum gas pressure =5N/mm$^{2.}$

    Indicated mean effective pressure=0.75N/mm^2

    Mechanical efficiency=80%

    Fuel consumption =0.15 kg per brake power per hour

    high calorific value of fuel= 42x10^{3}kJ/kg

    Speed=2000rpm

2. Design a cast iron cylinder for an IC engine whose bore diameter is 80mm and   (15)
    the maximum combustion pressure is 5.5MPa.

3. A 80 mm diameter full journal bearing support a radial load of 600N. The speed   (15)
    of the shaft = 1200rpm. Design the bearing.

PART B

Answer any two full questions, each carries 15 marks.

4. A single dry plate clutch is to be designed to transmit 8 kW at 1000 rpm.   (15)

    a) Find out the clutch dimensions assuming the ratio of the mean radius to the face
       width as 4.

    b) Also design spring for the same.

5. A multi plate disc clutch transmit 4kW at 1000rpm.The outer radius is limited to   (15)
    65mm.Assume any suitable material and design the clutch.

6.   Design a single deep groove ball bearing as per the specifications: radial load   (15)
     =4000 N and axial load =5000 N, speed =1600rpm and average life 3000 hours.
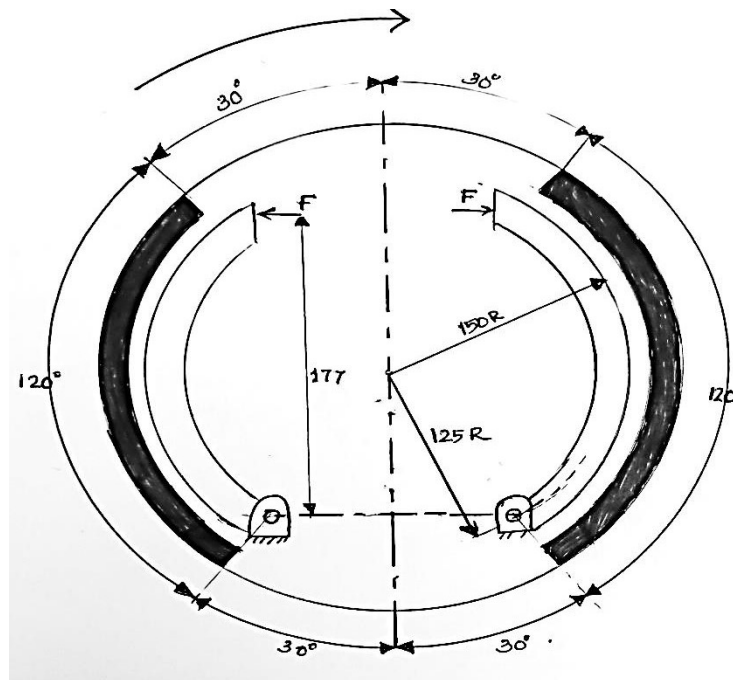
PART C

Answer any two full questions, each carries 20 marks.

7.   An automotive type internal expanding shoe is shown in the diagram. The face   (20)
     width of the friction lining is 60mm and the coefficient of fiction is 0.35.the
     maximum intensity of pressure is limited to 1.2 N/mm^2.Assume angle θ=0.
     Calculate

     (1) the actuating force 'F'

     (2) The torque capacity of the brake

8.   A pair of helical gear is required to transmit 15kW at 2000rpm. The output shaft   (20)
     is running at 500rpm. The helix angle is 30˚. Design the pair of gears.

9.   A pair of spur gear is required to transmit 10kW power. The input shaft rotates   (20)
     at 576rpm and the output shaft rotates at 144rpm. Design the spur gear.

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