

Code No: RT31031

R13**SET - 1****III B. Tech I Semester Supplementary Examinations, May - 2018****DYNAMICS OF MACHINERY**

(Common to Mechanical Engineering and Automobile Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is compulsory3. Answer any **THREE** Questions from **Part-B****PART -A**

- 1 a) What is the function of Gyroscope? [4M]
- b) List the types of clutches? [4M]
- c) Define crank effort? [3M]
- d) Write about isochronism? [4M]
- e) Write about swaying couple? [4M]
- f) Explain about vibration isolation? [3M]

PART -B

- 2 a) An aeroplane makes a complete half circle radius towards left when flying at 210 km/h. The rotary engine and the plane is of 50 kg mass having a radius of gyration of 300 mm. The engine rotates at 2400 rpm clockwise as seen from the rear. Find the gyroscopic couple on the aircraft and its effect on the plane. [8M]
- b) Explain the working of a Gyroscope along with an example of its use and give its merits and demerits [8M]
- 3 a) A single plate clutch having both sides effective is required to transmit 45 kW at 1500 rpm. The outer diameter of the plate is limited to 300 mm and the intensity of pressure between the plates is not to exceed 0.07 MPa. Assuming uniform wear and a coefficient of friction 0.35, determine the inside diameter of the plate? [9M]
- b) Explain about boundary friction and film lubrication? [7M]
- 4 a) The torque exerted on the crank shaft of a two stroke engine is given by the equation $T = (14,500 + 2,300 \sin 2\theta - 1,900 \cos 2\theta)$ N-m where θ is the angle moved by the crank from I.D.C. If the resisting torque is constant find: [10M]
 - i) The power of the engine, when the speed is 150rpm.
 - ii) The moment of inertia of the flywheel if the speed variation is not to exceed $\pm 0.5\%$ of the mean speed.
 - iii) The angular acceleration of the flywheel when the crank has turned through 30° from the I.D.C.
- b) Explain about coefficient of fluctuation of speed and coefficient of fluctuation of energy. [6M]

SET - 1

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