# Rajasthan Institute of Engineering & Technology,Jaipur.

## Department of Mechanical Engineering

**I Mid Term examination**
**Session: 2018-19**
**VSemester & ME**
## Dynamics of Machines 5ME2A

Time: 2hrs.                                    Set-I                                    M.M.:20

**Instruction for students:**

1. No provision for supplementary answer book.

Q.1 What do you understand by Governors? Derive the equation of lift of sleeve for Porter Governor.

Or

Q.1 A porter governor has equal arms each 250 mm long & pivoted on the axis of rotation Each ball has a mass of 5 kg and the mass of central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift & 200 mm when the governor is at maximum speed .Find the minimum & maximum speeds & range of speed of the governor.

Q.2 Explain the working of Pickering Governor & write their formulas of deflection.

Or

Q.2 A Hartnell Governor having a sleeve spring & two right angled bell crank levers moves between 290rpm & 310rpm for a sleeve lift of 15mm The sleeve arms & the ball arms are 80mm & 120mm respectively. The lavers are pivoted at 120mm from the governor axis & mass of each ball is 2.5 kg The ball arms parallel to the governor axis at the lowest equilibrium speed .Determine loads on the spring at the lowest & highest equilibrium speed.

Q.3 Explain the effect of Gyroscopic Couple on a Naval ship during Steering ,Pitching and Rolling with neat sketch .

Or

Q.3 Drive a relation for stability of a four Wheel drive moving in a Curved Path.

Q.4 Derive a relation for Energy stored in a Flywheel

Or

Q.4 Differentiate Simple & Reverted gear train with neat sketch .

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Time: 2hrs.                                    Set-II                                    M.M.:20

**Instruction for students:**

1. No provision for supplementary answer book.

Q.1 Differentiate between Governor and Flywheel? Writedown the classification of Governors.

Or

Q.1 A porter governor has equal arms each 250 mm long & pivoted on the axis of rotation,Each ball has a mass of 5 kg & the mass of central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift & 200 mm when the governor is at maximum speed .Find the minimum & maximum speeds & range of speed of the governor

Q.2 In a Proell governor has equal arms of length 300 mm,The upper & lower arms are pivoted on the axis of governor.The extension arm of lower link each 80 mm long & parallel to to the axis of when the radious of rotation of balls is 150 mm and 200 mmm.The mass of each ball 10 kg & mass of the central load 100 kg.determine the range of governor

Or

Q.2. Write short notes:-Any two
(a) Isochronous Governor (b) Sensitiveness of governor (c) Governor Hunting

Q.3 Explain the effect of Gyroscopic Couple on a Naval ship during Steering ,Pitching and Rolling with neat sketch.

Or

Q.3The Controlling force $F_c$ in Newton & Radius of rotation( r) in meter for Spring controlled governor is expressed by-                    **$F_c = 2800r-76$**
The Mass of ball is 5 kg & extreme radius of rotation of balls is 100 mm & 175 mm .Find the Maximum & Minimum speeds of equilibrium.

Q.4 Established a relation for stability of a Two wheeler motorcycle moving in a Curved Path

Or

Q.4 Construct a table for calculating the Speed ration of Simle Epicyclic gear train with neat sketch.