



**Question (1)** **(50 Marks)**

For specific shaft with diameter ( $R$ ) rotates with angular speed ( $N$ ) and carried by journal bearing with length and radial clearance ( $c$ ), prove that friction coefficient depends on  $\left(\frac{NR}{Pc}\right)$ , (where  $P$  is the radial load per unit of projected bearing area). By using Petroff's hypothesis, show also how to calculate friction torque.

**Question (2)** **(50 Marks)**

- [2.1] Define fluid bearing and what is the difference between hydrodynamic fluid and hydrostatic fluid.
- [2.2] What is the difference between hydrodynamic and hydrostatic bearings.
- [2.3] Explain hydrostatic and hydrodynamic bearing theory.
- [2.4] Describe the characteristics of the common plain bearing materials.
- [2.5] What are the types of hydrostatic and hydrodynamic bearing and their applications.
- [2.6] What are the advantages and disadvantages of hydrostatic and hydrodynamic bearings.

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**Good Luck**

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