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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
MID TERM EXAMINATION - NOV 2023**

**Semester :** Semester V - 2021

**Course Code :** MEC4004

**Course Name :** Sem V - MEC4004 - Dynamics of Machines

**Program :** B. TECH

**Date :** 6-NOV-2023

**Time :** 9:30AM - 11:00AM

**Max Marks :** 50

**Weightage :** 25%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

**PART A**

**ANSWER ALL THE QUESTIONS**

**(5 X 2 = 10M)**

1. When will a distributed mass can be replaced by two point masses to have the same dynamical properties? (CO1) [Knowledge]
2. What is an Applied Force? (CO1) [Knowledge]
3. Write expression for the Force acting on Connecting Rod. (CO1) [Knowledge]
4. Define Coefficient of Fluctuation of speed in flywheel. (CO2) [Knowledge]
5. Define Coefficient of Fluctuation of Energy in flywheel. (CO2) [Knowledge]

**PART B**

**ANSWER ALL THE QUESTIONS**

**(2 X 10 = 20M)**

6. If the crank and the connecting rod are 300 mm and 3 m long respectively and the crank rotates at a constant speed of 200 r.p.m., determine: 1. The crank angle at which the maximum velocity occurs (CO1) [Comprehension]
7. Flywheel is used to store the Energy and release the Energy. Identify in which form it stores the energy and identify the relation for Fluctuation of Energy in Flywheel. (CO2) [Comprehension]

## PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. The crank-pin circle radius of a horizontal engine is 300 mm. The mass of the reciprocating parts is 250 kg. When the crank has travelled  $60^\circ$  from I.D.C., the difference between the driving and the back pressures is  $0.35 \text{ N/mm}^2$ . The connecting rod length between centres is 1.2 m and the cylinder bore is 0.5 m. If the engine runs at 250 r.p.m. and if the effect of piston rod diameter is neglected, calculate: 1. pressure on slide bars, 2. thrust in the connecting rod, 3. tangential force on the crank-pin, and 4. turning moment on the crank shaft.

(CO1) [Application]