INDIAN MARITIME UNIVERSITY

(A CENTRAL UNIVERSITY, GOVT. OF INDIA)

SEMESTER- II, B.TECH. (MARINE ENGINEERING) – JUNE 2014 EXAMS

ENGINEERING MECHANICS - II (T 2206)

(AY 2013-14 batch onwards)

Time:- 3 HrsMax Marks : 100
Date: 30.06.2014Pass Marks : 50

PART - A (3 X10 = 30 Marks)
Compulsory Questions

1. a) Define co-efficient of friction and angle of friction.(3)
   b) Explain an open and closed belt pulley.(3)
   c) Define the terms Amplitude, Phase difference in S.H.M.(3)
   d) What is radius of gyration?(3)
   e) What is D'Alembert's e principle?(3)
   f) do you understand by 'open belt and crossed belt pulley?(3)
   g) What is the rise of a governor? How does a governor differ from that of flywheel?(3)
   h) What is a simple band brake? When it becomes self locking?(3)
   i) What is the moment of inertia? Why it is important in curvilinear motion? (3)
   j) What is centrifugal tension in a belt and how it affects the power transmitted? (3)

PART - B (5 X14 = 70 Marks)
Answer Any Five of the following

2. A thrust shaft of a marine ship has 6 collars of 600 mm external diameter and 300 mm internal diameter. The total thrust from the propeller is 100 KN. If the co-efficient of friction is 0.12 and speed of the engine is 90 R.P.M., find the power absorbed in friction at the thrust block, assuming a) Uniform pressureb) Uniform wear.(14)

3. Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 1.95 m apart and are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 R.P.M., if the maximum permissible tension in the belt is 1.0 KN and the coefficient of friction between the belt and pulley is 0.25?(14)

diameter that bisects the angle of contact.(14)

4. A point moves with SHM and when this point is 0.85 m from the mid path it's velocity is 15 m/s and when 2.5 m from the centre of its path its velocity is 5m/s. Find its angular velocity, amplitude, time period and maximum acceleration. (14)

5. A simple band brake operates on a drum of 600 mm in diameter that is rotating at 200 R.P.M. as shown in the figure 1. The coefficient of friction is 0.25. The brake band has a contact of 270_o, one end is fastened to a fixed pin and the other end to the brake arm 125 mm from the fixed pin.