



Sri Vidya College of Engineering and Technology
Sivakasi main road, Virudhunagar – 626 005
Department of Mechanical Engineering



Internal Test - I

Semester & Branch	05 / Mechanical Engineering	Date:	22.08.14
Subject Name	Dynamics of Machinery	Max. Marks	50
Subject Code	ME2302	Max. Time	90 min

Part A

(5X2 =10)

- 1 Differentiate between static and dynamic equilibrium (*outcome a , learning skill- remembering*)
- 2 State D'Alembert's principle (*outcome a, learning skill-remembering*)
- 3 What is meant by turning moment diagram or crank effort diagram? (*outcome a ,learning skill-remembering*)
- 4 Define coefficient of fluctuation of energy (*outcome a ,learning skill- remembering*)
- 5 What is free body diagram (*outcome a ,learning skill- remembering*)

Part B

- 6 (a) Four masses A, B, C, and D are completely balanced masses C and D makes angles of 90° and 195° respectively with B in the same sense. The rotating masses have the following properties: 16
- $m_A=25$ kg $r_A=150$ mm
 $m_B=40$ kg $r_B=200$ mm
 $m_C=35$ kg $r_C=100$ mm
 $r_D=180$ mm, Planes B and C are 250mm apart. Determine,
- (i) the mass A and its angular position
(ii) the position of planes A and D. (*outcome a, b ,learning skill - understanding and applying*)

Or

- 6 (b) The length and connecting rod of a horizontal reciprocating engine are 200mm and 1meter respectively. The crank is rotating at 400rpm. When the crank has turned 30° from the inner dead centre, the difference of pressure between cover end and piston rod is 0.4 N/mm². If the mass of the reciprocating parts is 100 kg and a cylinder bore is 0.4meters. Calculate 16
- (i) Inertia force (ii) Force on piston (iii) Piston effort (iv) Thrust on the side of the cylinder walls (v) Thrust in the connecting rod (vi) Crank effort (*outcome a, b , learning skill - understanding and applying*)



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- 7 (a) Four masses M_1 , M_2 , M_3 , and M_4 are 200kg, 300kg, 240kg and 260kg 16
respectively. The corresponding radii of rotation are 0.2m, 0.15m, 0.25m and
0.3m respectively and the angle between successive masses 45° , 75° , and
 135° . Find the position and magnitude of balance mass required if its radius of
rotation is 0.25m. (*outcome a, b, learning skill - understanding and applying*)

Or

- 7 (b) The turning moment diagram for a multi cylinder engine has been drawn to a 16
vertical scale of 1 mm = 650 N-m and a horizontal scale of 1 mm = 4.5 deg. The
areas above and below the mean torque line are: -28, +380, -260, +310, -300,
+242, -380, +265 and -229 mm². The fluctuation of speed is limited to + or -
1.8% of the mean speed which is 400 rpm. The density of the rim is 7000
kg/m³. The width of the rim is 4.5 times its thickness. The centrifugal stress
(hoop stress) in the rim material is limited to 6 N/mm². Neglecting the effect of
the boss and arms, determine the diameter and cross section of the flywheel rim.
(*outcome a, b, learning skill - understanding and applying*)

- 8 (a) Explain how to balance the several masses rotating in the same with neat sketch 08
(*outcome a, learning skill - understanding and remembering*)

Or

- 8 (b) Derive the expression for Angular velocity and angular acceleration of the 08
connecting rod in a reciprocating engine mechanism. (*outcome a, learning skill -
understanding and remembering*)

Prepared by

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