Total No. of Questions : 4]

SEAT No. :

PC197

[Total No. of Pages : 2

[6361]-55
B.E. (Mechanical) (Insem)
DYNAMICS OF MACHINERY
(2019 Pattern) (Semester - VII) (402042)

Time : 1 Hour 15 Min.] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q.No.1 or Q.No.2, Q.No.3 or Q.No.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is balancing? Why there is the need of Balancing? **[5]**

b) A shaft carries four rotating masses A, B, C and D of magnitude 200kg, 300kg, 400kg and 200kg respectively. They are revolving at radii 80mm, 70mm, 60mm and 80mm in a plane measure from A at 300mm, 400mm and 700mm. The angles between the cranks measured in anticlockwise are A to B 45, B to C 70 and C to D 120. The balancing masses are to be placed in plane X and Y. The distance between the plane A and X is 100mm, between X and Y is 400mm and between Y and D is 200mm. If balancing masses revolve at a radius of 100mm find their magnitude and angular position. **[10]**

OR

Q2) a) Explain the concept of Balancing of several masses rotating in different planes? **[5]**

b) Four masses are fully balanced. The masses C and D are at 80º and 110º respectively with B in same sense. The masses at B, C and D are 60kg, 55kg & 80kg. The radii are r_a, r_b, r_c, r_d are 125mm, 170mm, 90mm and 170mm respectively. The planes B and C are 230 mm apart. Determine the masses A and its angular position, the positions of planes A and D? **[10]**

P.T.O.

Q3) a) What are different applications of gyroscope? **[5]**

b) Ship is propelled by turbine having mass of 5000kg and speed of 2200rpm. The direction of rotar is anticlockwise as viewed from bow end. The radius of gyration is 400mm. Determine gyroscopic effect when

i) Ship is steering to left in curve of 50m radius at speed of 15 knots (Take 1 knot = 1800m/hr)

ii) Ship is pitching in SHM with bow descending with maximum velocity. The time period of pitching is 16 seconds and ship pitches 8^o and 8^o below the normal position.

iii) Ship is rolling and at instant its angular velocity 0.04 rad/sec counter clockwise when viewed from stern. **[10]**

OR

Q4) a) Sate the principal gyroscope? Write note on gyroscopic effect on pitching of a ship? **[5]**

b) A disc of mass 10kg and of radius of gyration of 80mm is mounted centrally on a horizontal shaft of 100mm length between the bearings. The disc is spinning about the axis of the shaft at 600 rpm anticlockwise, when viewed from the right-hand side bearing. The shaft processes about a vertical axis at 35 rpm in the clockwise direction when observed from the top. Determine the resultant reaction at each bearing due to the mass and the gyroscopic effect. **[10]**

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