Q.P. Code: 16ME305 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations March-2021

DYNAMICS OF MACHINERY

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Define coefficient of fluctuation of speed and coefficient of fluctuation of energy	6M
	b	The radius of gyration of a fly wheel is 1meter and fluctuation of speed is not to exceed 1%of the mean speed of the flywheel. If the mass of the flywheel is 3340kg and the steam develops 150KW at 135rpm, then find (i).Maximum fluctuation of energy (ii). Coefficient of fluctuation of energy.	6M

OR

2		The turning moment diagram for Petrolengine is drawn to a scale of 1mm to 600N-m and the horizontal scale of 1mm to 1°.The turning moment repeat itself after every half revolution of the engine. The area above and below the mean torque line are 305, 710, 50,350,980and 276Mm.The mass of rotating parts is 40kg at a radius of gyration of 140mm.Clculate the coefficient of fluctuation of speed if the mean speed is 1500rpm.	12M

UNIT-II

3		A single disc clutch internal and external diameter as 200 and 300 mm. maximum intensity pressure as 0.06 N/mm².the coefficient of frictional surface shaft and plate surfaces as 0.03 N/mm².determine power lost in to the shaft. Assuming uniform wear. shaft speed rotating with speed of 1200 rpm.	12M

OR

4	a	Describe with neat sketch the lope brake dynamometer	6M
	b	Describe with sketches one form of torsion dynamometer and explain in detail the calculations involved in finding the power transmitted.	6M

UNIT-III

5		A porter governor has equal arms each 250mm long and pivoted on the axis of rotation. Each ball has a mass of 5kg and mass of the central load on the sleeve is 25kg. The radius of rotation of the ball is 150mm when governor is at maximum speed. Find the maximum and minimum speed and range of speed of the governor	12M

OR

6		A hartnell governor having a central sleeve spring and two right angled bell crank lever operates between 290rpm and 310rpm for a sleeve lift of 16Mm. The sleeve and ball arms are 80mm and 120mm respectively. The levers are pivoted at 120mm from the governor axis and mass of the ball is 2.5kg.The ball arms are parallel at lowest equilibrium speed. Determine (i) load on the spring at maximum and minimum speeds and (ii) Stiffness of the spring.	12M

UNIT-IV

7		A four cylinder vertical engine has cranks 300mm long. The plane of rotation of the first, third and fourth cranks are 750mm,1050mm and 1650mm respectively from that of the second crank and their reciprocating masses are 10kg,400kg and 250kg respectively. Find the mass of the reciprocating parts for the second cylinder and relative angular position of the cranks in order that the engine may be in complete balance.	12M

OR

8	A, B, C and D are four masses carried by a rotating shaft at radii 100mm,126Mm,200mm and 150mm respectively. The planes in which the masses revolve are spaced 600mm apart and the masses of B,C and D are 10kg,5kg and 4kgrespectively.Find the required mass A and relative angular setting of the four masses so that the shaft be in complete balance.	**12M**

UNIT-V

9	A cantilever shaft 50mm diameter and 300mm long has a disc of mass 100kg at its free end. The young's modulus for the shaft material is 200GN/m2.SDetermine the frequency of longitudinal and transverse vibration of the shaft.	**12M**

OR

10	A steel shaft 100mm in diameter is loaded and support in shaft bearing 0.4m apart. The shaft carries three loads: first mass 12kg at the centre, second mass 10kg at a distance 0.12m from the left bearing and third mass of 7kg at a distance 0.09m from the right bearing. Find the value of the critical speed by using Dunkerley's method. E=210GN/m2.	**12M**

*** END ***