

Roll No.

OLE-24257

B. Tech. 5th Semester (ME) Examination – April, 2021

DYNAMICS OF MACHINES

Paper : ME-301-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. Explain : 5 × 4 = 20

- (a) Firing order
- (b) Star Engine
- (c) Indicator diagram
- (d) Inertia governors

UNIT – I

2. What do you understand by static and dynamic force analysis ? Give examples. 20
3. Draw and explain Klien's construction for determining the velocity and acceleration of the piston in a slider crank mechanism. 20

UNIT – II

4. In a laboratory experiment, the following data were recorded with rope brake : 20
Diameter of the flywheel 1.2 m;
Diameter of the rope 12.5 mm;
Speed of the engine 200 r.p.m. ;
Dead load on the brake 600 N;
Spring balance reading 150 N. Calculate the brake power of the engine.
5. A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance. 20

UNIT – III

6. Derive the following expressions for an uncoupled two-cylinder locomotive engine : 20
- (a) Variation in tractive force;
 - (b) Swaying couple, and
 - (c) Hammer blow.
7. Explain the term height of the governor. Derive an expression for the height in the case of a Watt governor. What are the limitations of a Watt governor ? 20

UNIT – IV

8. Explain the effect of the gyroscopic couple on an aeroplane while taking a left turn looking from the rear. 20
9. Explain the effect of the gyroscopic couple on ship while pitching upwards and rolling. 20
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