

5E6202

Roll No. : _____

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B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Mechanical Engineering
5ME2A Dynamics of Machines (AE, ME)

Time : 3 Hours**Maximum Marks : 80****Min. Passing Marks : 24**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL 2. NIL

UNIT - I

- 1 (a) Classify Governors in various categories. 6
(b) Derive the relationship between Height of the Governor and its speed for a proell Governor. 10

OR

- 1 Define any two terms :
(i) Sensitiveness
(ii) Isochronism and stability of Governor
(iii) Hunting of Governor.

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UNIT - II

- 2 (a) Discuss the effect of the Governor couple on a two wheeled vehicle taking a turn. 8
- (b) Derive an expression for the angular acceleration of the connecting rod of a Reciprocating engine. 8

OR

- 2 An aeroplane flying with the speed of 200 km/hr turns towards right and completes a quarter circle of 50 m radius. The mass of the rotary engine and the propeller of the plane amounts to 400 kg with a radius of gyration of 300 mt. The engine speed is 1500 rpm. clockwise when viewed from the front. Determine the gyroscopic couple on the air craft and state its effect. In what way the effect changed when the aeroplane turns towards left ? 16

UNIT - III

- 3 (a) With the help of a neat sketch derive the condition for minimum no. of teeth on wheel to avoid interference. 10
- (b) What do mean by undercutting of Gears ? 6

OR

- 3 A pinion of 32 involute teeth and 4 mm module driver a rack. The pressure angle is 20° . the Addendum of both pinion and of the Addendum to avoid interference. Also find the number of pairs of teeth in contact. 16

UNIT - IV

- 4 (a) Explain the working of a sliding mesh gear box. 8
- (b) Discuss the speed ratio of a compound gear train. 8

OR

- 4 Draw a neat sketch of sun and planet gear arrangement. Using tabular method derive the expression for speed of arm when sun wheel is fixed and when annular wheel is fixed respectively. 16

UNIT - V

- 5 (a) Explain the effect of partial balancing in locomotives. 8
- (b) Describe any one type of static balancing machine. 8

OR

- 5 The axis of a three-cylinder air compressor are at 120° to one another and their connecting rods are coupled to a single crank. The length of each connecting rod is 240 mm and the stroke is 160 mm. The reciprocating parts have a mass of 2.4 kg per cylinder. Determine the primary and secondary forces if the engine runs at 2000 rpm. 16