

Code No: R1622353

R16**SET - 1****II B. Tech II Semester Regular/Supplementary Examinations, April/May - 2019****THEORY OF MACHINES**

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B****PART -A**

1. a) Explain kinematic chain. (3M)
- b) Draw the turning moment diagram of a single cylinder double acting steam engine. (2 M)
- c) Give the applications of flywheel. (2 M)
- d) Explain the effect of centrifugal tension in a belt. (2M)
- e) Explain hunting in governors. (3M)
- f) What are the classifications of follower according to follower shape? (3M)

PART -B

2. a) What do you mean by rigid link? Explain types of links with examples. (7M)
- b) Draw a neat proportionate sketch of 'Whitworth mechanism'. Indicate clearly the positions of driver crank corresponding to the extreme positions of shaper tool. (7M)
3. a) Two involute gears of 20° pressure angle are in mesh. The number of teeth on pinion is 20 and the gear ratio is 2. If the pitch expressed in module is 5 mm and the pitch line speed is 1.2 m/s, assuming addendum as standard and equal to one module, find: i) The angle turned through by pinion when one pair of teeth is in mesh and ii) The maximum velocity of sliding. (7M)
- b) Explain precisely the uses of turning moment diagram of reciprocating engines. (7M)
4. a) Obtain an expression for the length of a belt in i) An open belt drive and ii) A cross belt drive. (7M)
- b) A belt drive consists of two V-belts in parallel, on grooved pulleys of the same size. The angle of the groove is 30° . The cross-sectional area of each belt is 750 mm^2 and $\mu=0.12$. The density of the belt material is 1.2 Mg/m^3 and the maximum safe stress in the material is 7 Mpa. Calculate the power that can be transmitted between pulleys 300 mm diameter rotating at 1500 r.p.m. Find also the shaft speed in r.p.m. at which the power transmitted would be maximum. (7M)
5. a) Explain the advantages and disadvantages of chain drive over belt drive. (7M)
- b) Which of the two assumptions-uniform intensity of pressure or uniform rate of wear, would you make use of in designing friction clutch and why? (7M)

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6. a) 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. (7M)
b) Explain controlling force and controlling force curves. (7M)
7. a) Explain the term 'Partial balancing of primary force'. Why is it necessary? (7M)
b) Define and explain the terms: cam profile, base circle, prime circle, pitch curve, lift and period of dwell. (7M)