

Code No: R1622353

R16**SET - 1****II B. Tech II Semester Supplementary Examinations, November - 2018****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**

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**PART -A**

1. a) What is a kinematic chain (3M)
- b) Define law of gearing (2M)
- c) What is the difference between governor and a fly wheel? (2 M)
- d) Define turning moment diagram (2M)
- e) What is meant by static and dynamic unbalance in machinery? How can the balancing be done? (3M)
- f) Name two inversions of double slider crank chain (2M)

**PART -B**

2. a) Differentiate between sliding pair and turning pair (4M)
- b) Explain with help of sketches various inversions of slider crank chain (10M)
3. a) How are gears classified and what are the various terms used in spur gear technology? (7M)
- b) What is the difference between simple gear train and compound gear train? Explain with help of sketches (7M)
4. a) Derive an expression for length of a crossed belt drive (7M)
- b) Discuss the different types of belts and their material used for power transmission (7M)
5. a) State advantages and disadvantages of chain drives over rope drives (6M)
- b) Establish a formula for the frictional torque transmitted by a cone clutch (8M)
6. In a Hartnell type governor the two masses are 4 kg each and the load on the sleeve is 40N. If with the weight arms vertical, the path radius is 8 cm and the equilibrium speed neglecting friction 420 *r.p.m.* Find the corresponding compression force in the spring. Find also the friction force at the sleeve which can be overcome in this position for an increase in speed of 1%. If the sleeve movement is to be 1 cm for increase in speed of 5% from the 420 *r.p.m.* position, find the required spring stiffness, if gravity effect on the masses is neglected. (14M)

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7. Four masses A, B, C and D are completely balanced. Masses C and D make angles of  $90^\circ$  and  $210^\circ$  respectively with B in the same sense. The planes containing B and C are 300mm apart. Masses A, B, C and D can be assumed to be concentrated at radii of 360, 480, 240 and 300mm respectively. The masses B, C and D are 15kg, 25kg and 20kg respectively. Determine i) The mass A and its angular position ii) The positions of planes A and D (14M)

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