Code No: R1622353 **R16** SET - 1

II B. Tech II Semester Regular Examinations, April- 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) Explain the difference between higher pairs and lower pairs (3M)
   b) How does spur gear is different from helical gear (2M)
   c) What is the function of a governor? How does it differ from a fly wheel (2M)
   d) Define coefficient of fluctuation of energy (2M)
   e) Why is balancing necessary for rotors of high speed engines? (3M)
   f) Define the terms slip and creep (2M)

PART -B

2. a) Explain the difference between mechanism and machine. (4M)
   b) What is inversion? Explain with help of suitable sketches the inversion of slider crank chain mechanism. (10M)

3. a) Mention the important types of gears and discuss their applications, the materials used for them and their construction. (7M)
   b) Explain briefly the differences between simple, compound, and epi-cyclic gear trains. (7M)

4. a) Explain why flywheels are used in punching machines. Does the mounting of the flywheel reduce the stress induced in the shaft. (7M)
   b) Derive an expression for length of an open belt drive. (7M)

5. a) State advantages and disadvantages of chain drives over belt drives (6M)
   b) What is a clutch? Discuss the various types of clutches giving at least one practical application for each (8M)

6. For a spring controlled Hartnell type governor, following data is provided: (14M)
   Mass of the governor ball = 1.80 kg
   Length of the vertical bell crank lever = 8.75 cm
   Length of other arm of bell crank lever = 10.0 cm
   The speeds corresponding to radii of rotations of 12 cm and 13 cm are 296 and 304 r.p.m. respectively. Find the stiffness of spring.
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7. A rotating shaft carries four masses A, B, C and D which are radially attached to it. The mass centres are 30 mm, 38 mm, 40 mm and 35 mm respectively from the axis of rotation. The masses A, C and D are 7.5 kg, 5 kg and 4 kg respectively. The axial distances between the planes of rotation of A and B is 400 mm and between B and C is 500 mm. The masses A and C are at right angles to each other. Find for a complete balance, (14M)
i) The angles between the masses B and D from mass A,
ii) The axial distance between the planes of rotation of C and D,
iii) The magnitude of mass B.