

Code No: RT42351

**R13**

**Set No. 1**

**IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019**

**DESIGN OF AGRICULTURAL MACHINERY**

**(Agricultural Engineering)**

**Time: 3 hours**

**Max. Marks: 70**

*Question paper consists of Part-A and Part-B*

*Answer ALL sub questions from Part-A*

*Answer any THREE questions from Part-B*

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**PART-A (22 Marks)**

1. a) What is moment of force? [2]  
b) Explain different terms used in limit system. [4]  
c) What are different functions of springs and list out different types of springs? [4]  
d) Explain factors to be considered while designing harvesting machinery. [4]  
e) Explain different types of keys. [4]  
f) Explain fluctuation of energy in fly wheel. [4]

**PART-B (3x16 = 48 Marks)**

2. a) What are the different qualities required for design engineer and consumers views to be consider while designing. [8]  
b) Explain compressive and tensile stress and strains in a machine parts. [8]
3. a) Explain about Rankine's and Guest's theories. [8]  
b) Explain different types of fits with neat diagrams. [8]
4. a) A foot lever is 1 m from the center of shaft to the point of application of 800 N load. Find (i) Diameter of the shaft, (ii) Diameter of the key, and (iii) Diameter of rectangular arm of the foot lever at 60 mm from the centre of shaft assuming width of the arm as 3 times thickness. The allowable tensile stress may be taken as 73 MPa and allowable shear stress as 70MPa. [8]  
b) Explain construction of leaf spring. [8]
5. a) Explain design procedure of seed hopper in seed drill. [8]  
b) Explain calibration procedure of tractor drawn sprayer. [8]
6. a) Derive the equation for equivalent twisting and bending moments if shafts subjected to both twisting and bending moments. [8]  
b) A solid shaft is transmitting 1 MW at 240 r.p.m. Determine the diameter of the shaft if the maximum torque transmitted exceeds the mean torque by 20%. Take the maximum allowable shear stress as 60 MPa. [8]
7. a) Explain different types of sliding contact bearings. [8]  
b) Explain relationship between bearing characteristic number and coefficient of friction with graph. [8]