# R16

Set No. 1

**IV B.Tech II Semester Advanced Supplementary Examinations, October – 2021**
## 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 FOUR questions from Part-B*
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## PART−A *(14 Marks)*

1.  a)  Define young's modulus, shear modulus and shear stress                    [3]
    b)  What are linear and lateral strains?                                       [2]
    c)  Define lever? Enlist the types of levers.                                  [3]
    d)  What type of stresses induced in shafts?                                   [2]
    e)  Define tillage? List out any 5 secondary tillage implements.              [2]
    f)  Distinguish mower and reaper.                                              [2]

## PART−B *(4x14 = 56 Marks)*

2.  a)  Write the general considerations in while designing any machine.          [7]
    b)  Define machine design? Explain general procedure of designing of any farm
        machinery.                                                                 [7]

3.  a)  Explain the stress strain diagram in detail.                              [7]
    b)  Design a knuckle joint to transmit 150 kN. The design stresses may be taken as
        75 MPa in tension, 60 MPa in shear and 150 MPa in compression.            [7]

4.  a)  Find the diameter of a solid steel shaft to transmit 20 kW at 200 r.p.m. The
        ultimate shear stress for the steel may be taken as 360 MPa and a factor of safety
        as 8. If a hollow shaft is to be used in place of the solid shaft, find the inside and
        outside diameter when the ratio of inside to outside diameters is 0.5.    [7]
    b)  Discuss the function of a coupling. Give at least three practical applications.  [7]

5.  a)  Write about foot lever and cranked lever.                                 [7]
    b)  Explain the construction of leaf springs along with neat sketch.          [7]

6.  a)  Explain constructional features of M.B Plough.                            [7]
    b)  How to design a tractor operated seed cum fertilizer drill?               [7]

7.  a)  Explain power operated thresher components with the help of neat sketch.  [7]
    b)  Describe briefly about the tractor mounted boom sprayer.                  [7]