

Code No: R1642351

R16

Set No. 1

IV B.Tech II Semester Advanced Supplementary Examinations, Aug/Sep - 2022

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

PART-A(14 Marks)

1. a) What is moment of force? [2]
- b) What are the advantages of knuckle joint? [2]
- c) What are different classes of levers? [2]
- d) What are the different types of shafts? [2]
- e) What are the components of MB Plough? [3]
- f) What are the factors to be considered while designing harvesting machinery? [3]

PART-B(4x14 = 56 Marks)

2. a) Explain tensile strain and shear strain with line diagrams [7]
- b) What are the different qualities required for design engineer and consumers view to be consider while designing. [7]
3. a) Explain different failures in socket and spigot cotter joint with equations. [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) Explain with equations if springs are connected in series and parallel [7]
- b) 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. [7]
5. a) Explain with neat sketches rectangular sunk key and splines [7]
- b) Explain the necessity of coupling and list various types of couplings [7]
6. a) Explain design procedure of seed hopper in seed drill. [7]
- b) Explain design procedure of different components of tractor drawn rotavator. [7]
7. a) Explain calibration procedure of tractor drawn sprayer. [7]
- b) Explain design procedure of different components of mower. [7]

