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**B. TECH**  
**(SEM VII) THEORY EXAMINATION 2020-21**  
**DESIGN OF AGRICULTURAL MACHINERY**

*Time: 3 Hours**Total Marks: 100***Note:** Attempt all sections. If require any missing data; then choose suitably.

**SECTION - A**

- 1. Attempt all questions in brief. (2×10=20)**
- Define drawbar horse power.
  - What do you understand by 'happy seed drill'?
  - Define tilt angle.
  - Write the material composition of 'wood' and 'brass'.
  - What are the main functions of planter?
  - Define 'tempering'.
  - What is harvesting of the crops?
  - Write the basic difference between 'mower' and 'reaper'.
  - Define trailed type implement with the help of suitable example.
  - What do you understand by frictional safety hitch?

**SECTION – B**

- 2. Attempt any three of the following (10×3=30)**
- What are the different types of mechanical properties of materials? Write in brief.
  - Give a brief analysis of various forces acting on tillage implements with the help of a neat sketch.
  - Design a seed cum fertilizer drill for 35 hp tractor for sowing of wheat having seed rate 100 kg/ha. Assume any other data required.
  - Write step by step design procedure of manually operated planter.
  - Design a wheat thresher on rasp bar type threshing mechanism with capacity of threshing 5 quintal/hour. Find out its power requirement. Assume appropriate data wherever required.

**SECTION - C**

- 3. Attempt any one part of the following (10×1=10)**
- Explain the design procedure of combine harvester.
  - Design a disc harrow suitable for 50 hp tractor.
- 4. Attempt any one part of the following (10×1=10)**
- Describe step by step design procedure of tractor drawn mould board plough.
  - What do you mean by design of farm machines? Describe the factors which you should keep in your mind before designing a farm machine.
- 5. Attempt any one part of the following (10×1=10)**
- Define steel. Write its various types and also describe its heat treatment in detail.
  - A tractor is pulling a mould board plough at a forward speed of 5 km/hr and the force required to pull the plough is 15.6 KN. Determine the drawbar power required.
- 6. Attempt any one part of the following (10×1=10)**
- Design a disc plough for 35 hp tractors. Assume the necessary data required.
  - Determine the header length of a 5.5 kg/sec capacity self propelled combine harvester being used in harvesting of wheat crop (average yield 45.0 q/ha.) at a speed of 6 km/hr. Assume that 90% of cutting width is utilized during harvesting operation and straw factor for wheat crop as 1:1.15. Also threshing mechanism for the combine and power required to operate.
- 7. Attempt any one part of the following (10×1=10)**
- Write step by step design procedure of tractor drawn rotavator.
  - What are the main types of materials use for construction of agricultural machines? Describe.