

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B. Tech. Dairy Technology 2019-20**

Semester : **VII (New Syllabus)**  
Course No. : **DE - 712**

Academic Year : **2019-2020**  
Course Title : **Principles of Dairy  
Machine Design**

Credits : **2+1=3**  
Day & Date : **Wednesday, 15.01.2020**

Total Marks : **50**  
Time : **11.00 to 13.00 Hrs.**

- Note :
- 1) All questions from **Section 'A'** are compulsory.
  - 2) Solve **Any Five** questions from **Section 'B'**.
  - 3) Draw neat and well labelled diagram wherever necessary.

**SECTION - 'A'**

Q. 1 A) Choose the most appropriate answer from the options given below. (05)

- i) If number of coils are 8 and wire diameter of spring 3 mm, then solid length is given by?
  - a) 84 mm
  - b) 11 mm
  - c) 24 mm
  - d) 21 mm
- ii) White cast iron is formed when .....
  - a) Graphite flakes are formed
  - b) Most of the carbon content in the alloy forms iron carbide
  - c) No iron carbide is formed.
  - d) None of these
- iii) The force that brings all the given forces in equilibrium is called as .....
  - a) Equilibrant
  - b) Concurrent
  - c) Collinear
  - d) Coplanar
- iv) If uncompressed length of spring is 40 mm and number of coils 10 mm, then pitch of coil is .....
  - a) 4
  - b) 40/9
  - c) 40/11
  - d) 0.4
- v) The property of a material to absorb energy and to resist shock and impact load is known as .....
  - a) Flexural strength
  - b) Ultimate strength
  - c) Resilience
  - d) Ultimate stress

B) Define the following. (05)

- i) Co-efficient of Friction
- ii) Resilience
- iii) Strength
- iv) Angle of Friction
- v) Malleability

Q. 2 A) Give the formulae for the following. (05)

- i) Tensile Strain
- ii) Modulus of Rigidity
- iii) Ultimate Stress
- iv) Volumetric Strain
- v) Poisson's ratio

- B) State whether true or False. If false, rewrite the statement after making necessary corrections. (05)
- i) The stiffness of solid shaft is more than the stiffness of hollow shaft with same weight.
  - ii) When a material is loaded within elastic limit, then the stress is equal to strain.
  - iii) Two forces acting at a point are called concurrent forces.
  - iv) The longest leaf in a leaf spring is called as master leaf.
  - v) The proportional limit is defined as the stress at which strain curve begins to deviate from the straight line.

## SECTION - 'B'

- Q. 3 Write a short note on different types of beams, supports and loads. (06)
- Q. 4 What is spring? Write the use/functions of spring. Explain different types of spring with figure. (06)
- Q. 5 List the principal theories of failure of machine parts. Explain any one in detail. (06)
- Q. 6
- A) Give difference between Elastic modulus and shear modulus in brief. (02)
  - B) Give difference between Flat belt and V belt in brief. (02)
  - C) What are the major factors affecting on the design of shaft? (02)
- Q. 7
- A) Explain stress-strain diagram for steel. (03)
  - B) What are the general considerations in design of machine part? (03)
- Q. 8
- A) Enlist the important factors for selecting proper 'factor of safety' in equipment design. (02)
  - B) List the tests for determination of hardness of the material (02)
  - C) List the types of keys. (02)
- Q. 9
- A) Explain Lami's theorem. (02)
  - B) Write a short note on Bearings. (04)

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