

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B. TECH. (D.T.) DEGREE COURSE 2018-19**

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

Academic Year : **2018-2019**  
Course Title : **Principles of Dairy  
Machine Design**

Credits : **2+1 3**  
Day & Date : **Monday, 14/01/2019**

Total Marks : **50**  
Time : **15.00 to 17.00 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) In leaf springs, the longest leaf is known as .....
  - a) Lower leaf
  - b) Master leaf
  - c) Upper leaf
  - d) Eye leaf
- ii) The material commonly used for machine tools' bodies is .....
  - a) Mild steel
  - b) Aluminium
  - c) Copper
  - d) Cast iron
- iii) The forces which have same line of action are known as .....
  - a) Coplanar forces
  - b) Collinear forces
  - c) Concurrent forces
  - d) None of these
- iv) The centrifugal tension in the belt .....
  - a) Increases the power transmitted
  - b) Decreases the power transmitted
  - c) Has no effect on the power transmitted in the belt
  - d) Is equal to maximum tension
- v) If the sum of all forces acting on a body is zero, then the body may be in equilibrium provided the forces are .....
  - a) Concurrent
  - b) Parallel
  - c) Like parallel
  - d) Unlike parallel

B) Do as directed. (05)

- i) State the name of key with rectangular or square uniform section.
- ii) State range of Poisson's ratio for steel.
- iii) What should be the standard length of the shaft?
- iv) For which drives V-belts are particularly suitable?
- v) The maximum shear stress theory is used for which material?

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

- i) The formula for shear stress.
- ii) The moment of inertia of circular section of diameter (d).
- iii) Velocity of belt with maximum power transmission.
- iv) Thickness of rectangular key.
- v) Strain energy or resilience.

- B) State whether the following statements are True or False. If False, rewrite the statement after making necessary corrections. (05)
- i) A body is said to be in equilibrium, if it has no linear motion.
  - ii) Guest's theory is used for brittle material.
  - iii) In thrust bearings the load acts along the axis of rotation.
  - iv) The unit of weight is same as that of force.
  - v) Copper and their alloys falls in the categories of Non-ferrous metals.

### SECTION – 'B'

- Q. 3 Distinguish between centre of gravity and centroid. (06)
- Q. 4 A hollow circular section has an external diameter of 80 mm and internal diameter of 60 mm. Find its moment of inertia about the horizontal axis passing through its centre. (06)
- Q. 5 Describe the different types of keys with the help of neat sketch diagram. (06)
- Q. 6 Write short notes on the following.
- A) Bulk modulus (02)
  - B) Ultimate strength (02)
  - C) Creep (02)
- Q. 7. A) Enlist the different types of beam and explain cantilever beam in short. (03)
- B) Discuss the importance of shear force and bending moment diagrams. (03)
- Q. 8 A) Write short note on Lami's theorem. (02)
- B) Which types of stresses are induced in shaft? (02)
- C) Sketch the cross section of a V-belt and label its important parts. (02)
- Q. 9 A) Where leaf spring is used? (02)
- B) Discuss the stress strain diagram in brief. (04)

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