KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food.Engg) 2013 Admission
Vth Semester Final Examination-January -2016

Cat. No: Meen 3107 **Marks: 50.00**
Title: Machine Design (2+1) **Time: 2 hours**

I Fill in the blanks **(10 x 1=10)**

1. Shock resistance of steel is increased by adding ……
   a) Nickel b) Chromium c) Nickel and Chromium d) Sulphur,Lead & Phosphorus
2. Hook's law holds good up to ……
   a) Yield point b) Elastic Point c) Breaking Point d) Plastic Point
3. A screw is specified by its ……
   a) Major Diameter b) Minor Diameter c) Pitch Diameter d) Pitch
4. The taper on cotter varies from ……
   a) 1 in 15 to 1 in 10 b) 1 in 24 to 1 in 20 c) 1 in 32 to 1 in 24 d) 1 in 48 to 1 in 24
5. Two shafts will have equal strength, if …… of both the shafts are same
   a) Diameter b) Angle of twist c) Material d) Twisting moment
6. All types of levers are subjected to ……
   a) Twisting moment b) Bending moment c) Direct axial load d) Combined twisting & bending moment
7. The included angle for the V-belt is usually …… Degrees
   a) 20-30 b) 30-40 c) 40-60 d) 60-80
8. Two shafts made of same materials,the diameter of 1st shaft is twice as that of IInd shaft. The power transmitted by the 1st shaft will be …… of IInd shaft
   a) Twice b) Four Times c) Eight Times d) Six Times
9. The material suitable for the belts used in agricultural equipment is ……
   a) Cotton b) Rubber c) Leather d) Belata
10. The energy stored in a body when strained with in elastic limit is known as ……
    a) Resilience b) Proof Resilience c) Strain Energy d) Input Energy

II Answer any Five questions **(5 x 2=10)**

1. Define the following:
   a) Ductility b) Toughness c) Hardness d) Creep
2. What are the general considerations in machine design?
3. What do you understand by factor of safety?
4. Define the following:
   a) Major dia b) Minor dia c) Pitch d) Lead
5. Discuss the functions of coupling

6. What do you understand by leverage?
7. Define slip of the belt

III Answer any Five questions **(5 x 4=20)**

1. What are the common materials used in mechanical engineering design.
   How can the properties of steel be improved
2. Define the following
   I) Poisson's ratio ii) Volumetric strain iii) Bulk modulus
3. Discuss the design procedure of spigot and socket cotter joint
4. How the keys are classified? Draw a neat sketch and state the applications
5. A hollow shaft has greater strength and stiffness than solid shaft of equal weight. Explain
6. Explain the design procedure of a lever for a lever safety valve
7. Explain the crossed belt drive with the help of neat sketch

IV Answer any one question **(1 x 10=10)**

1. A shaft made of mild steel is required to transmit 100KW at 300rpm. The supported length of shaft is 3m, it carries two pulleys each weighing 1500N supported at a distance of 1 m from the ends respectively. Assuming the safe value of stresses. Determine the diameter of shaft
2. Design a Knuckle joint for transmitting 150KN. The design stresses may be taken as 75mPa in tension. 60mPa in shear and 150mPa in compression