KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food.Engg) 2012 Admission

Vth Semester Final Examination- January -2015

Cat. No:Meen.3107 **Marks: 80.00**

Title: Machine Design (1+1) **Time: 3 hours**

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

1. The maximum normal stress theory is used for _____materials
2. The resistance to fatigue of a material is measured by _____
3. The stretching in belt can be controlled by_____stress in the belt
4. A leaf spring in automobiles is used to absorb_____
5. In steam engine ,the piston rod is usually connected to the crosshead by means of a _____joint
6. The ratio of ultimate stress to the design stress is known as _____
7. Ratio of linear stress to linear strain called as_____
8. The material commonly used for crane hook is _____
9. The taper on cotter varies from_____to _____
10. Bevel gears are used to transmit power in between to shafts whose axes are _____

II Write short notes on any TEN questions **(10 x 3=30)**

1. Distinguish between shaft and axle from the design point of view
2. Define critical speed of shaft
3. What is nip and express its importance in leaf spring
4. Why are levers usually tapered
5. Explain about creep in belts
6. What is FOS ?Enumerate its features
7. Specify the types of gear failures
8. Define plane carbon steel
9. What are the applications of a cottered joint
10. Define tooth thickness ,tooth sapce and Backlash
11. What are the materials used for belts in power transmission
12. Differentiate between addendum and dedendum

III Write short notes on any SIX questions **(6 x 5=30)**

1. Explain about different types of coupling
2. Derive an expression for ratio of belt tensions Vs co-efficient of friction ($T1/T2= e^{\mu?}$)
3. Write the advantages and disadvantages of rolling contact bearing over sliding contact bearing
4. A hollow steel shaft tranmits 500 kw at 1000 rpm .The maximum shear stress is 50 N/mm^2. Find the outside and inside diameter of the shaft. If the outside diameter is twice the inside diameter ,assuming that maximum torque is 20 % greater than the mean torque
5. What are the methods of failure of knuckle joint
6. Write the advantages and disadvantages of V-belt drive over Flat -belt drive
7. Discuss the design procedure of spur gears
8. Discuss the important terms used in screw threads

IV Write an essay on any ONE **(1 x 10=10)**

1. Find out the diameter of cast iron pulleys and the thickness and width of a leather belt to transmit 128.7 KW power from a shaft that is directly connected to a steam engine running at 31.4 rad/sec to a centrifugal with a speed ratio of 1:3.5
2. Select a single row deep groove ball bearing for a radial load of 4000 N and an axial load of 5000 N,operating at a speed of 1600 r.m.p for an average life of 5 years at 10 hours per day. Assume uniform and steady load

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