KERALA AGRICULTURAL UNIVERSITY

B.Tech (Agrl.Engg) 2013 Admission

IVth Semester Final Examination-June/July -2015

Crse. No: Fpme.2210 Marks: 50.00

Title: Machine Design (2+1) Time: 2 hours

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

1. _____percent of zinc is present in brass
2. The metal is heated at a temperature about _____during hardening
3. The SI unit of tensile strength is _____
4. The greater the percent of elongation the greater the _____of the material
5. The main constituent of bronze is copper and _____
6. S.I unit of tension is _____
7. _____roller bearing is used where bearing space is small
8. Due to slip of the belt ,the velocity ratio of the belt drive_____
9. The power transmitted by a belt is maximum when the maximum tension in the belt is equal to _____fold of centrifugal tension
10. The velocity ratio of two pulleys connected by an open belt of crossed belt is _____proportional to their diameter

II Write short notes on any FIVE questions (5 x 2=10)

1. What is phases of design
2. Explain the phenomena of 'slip' and 'creep' in a belt drive
3. Differentiate between : failure stress, design stress and working stress
4. What is the function of a coupling
5. What is the function of a spring? In what type of springs the loaded deflection curve is not a straight line
6. What is the difference between a shaft and axle
7. Explain what do you understand by 'initial tension in belt'

III Write short notes on any FIVE questions (5 x 4=20)

1. Find the width of the belt ,necessary to transmit 7.5 kW to a pulley 300 mm diameter ,if the pulley makes 1600 rpm and the co-efficient of friction between the belt and the pulley is 0.22.Assure the angle of contact as 210^0 and the maximum tension in the belt is not to exceed 8 Nmm^{-1} width
2. A V-belt drive consists of three V-belts in parallel on groove pulleys of the same size. The angle of groove is 30^0 and the co-efficient of friction 0.12 .The cross sectional area of each belt is 800 mm^2 and the possible safe stress in the material is 3MPa.Calculate the power that can be transmitted between two pulleys 400 mm in diameter rotating at 960 rpm.

3. Write short note on (i) Bronze (ii) Aluminum
4. What is the purpose of 'standardization'
5. Differentiate between a close coiled and open coiled helical spring
6. What do you understand by cold rolled and cold drawn shafting
7. Give the application and limitation of sliding bearings.

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

1. Obtain an expression for the length of a belt in
   a) An open belt drive; and
   b) A cross belt drive
2. A journal bearing is proposed for a centrifugal pump. The diameter of the journal is 150 mm and the load on it is 400 kgf and its speed is 900 rpm. Complete the design calculation for the bearing

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