MENOUFIA UNIVERSITY
Faculty of Engineering
Shebin El- Kom
Final Examination
Academic Year :2013-2014
Date : 4 / 6 / 2014

Minufiya University

Dept. of Production Eng.& Mech. Design
Second Year Mech. Power.
Subject : M/c Elements Design .
Code : PRE 228
Time Allowed : 3 Hours
Total Marks : 100

Tables & Charts are allowed.

Question No. 1 (35 Marks)

a- Design a casted Flat- belt pulley to transmit 30 HP at 740 r.p.m. The pulley diameter is 40 cm. The permissible tension for leather belt is 55.8 Kg / cm. width & T1 / T2 = 2.36 . (20 Marks).

b-Design a GIB-head key required to fixing the pulley, where , $[\tau]$ =800-1200 Kg/cm2 (15 Marks) .

Question No. 2 (15 Marks)

Two shafts are connected by means of a coupling to transmit 5 H.P at 1440 r.p.m. The flanges of the coupling are fastened by means of 4 bolts at a radius of 30 mm. Permissible shear stress in the bolts = 3 Kg / sq. mm. Design the bolts .

Good Luck , Dr. GABER M. SHEHA .

With our best wishes

This exam contributes by measuring the achieving Programme Academic Standards according															
Ques. Number	Q1	Q2				Q1	Q2				Q1	Q2			
Skills	a3-1	a4-1	a1-1			b1-1						c 3-1			
	Knowledge&Understanding Skills					Intellectual Skills					Professional Skills				

Question 3:- (15 mark)

Design a lap joint for a mild steel tie-bar 450mmx12mm thick. Assume allowable stresses in tension and compression of the plate material as 112MPa and200MPa respectively and shear stress of the rivets as 84MPa.Take $d_o=6xS^{½}$ and $t=3\ d_o$ and P =196KN.

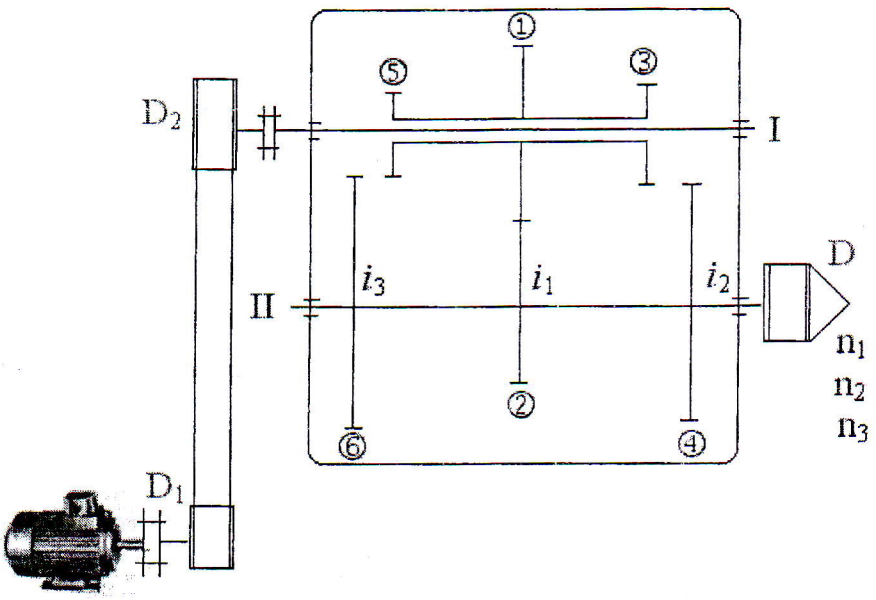
Question 4:- (10 mark)

Determine the requisite length of a lap welds joining a steel strip to a plate . The strip dimensions are 150x 10 mm. Load =60 ton. Material of strip and plate are St-3., and Electrodes EL- 42. τ shp =11 Kg/mm² ., σbrakep = 27 Kg/mm² , σ tenp = 18 Kg/mm².

C1	compression	Tension	shear
	1.00	0.90	0.60

Question5:- (25 mark)

An electric motor, its power is 3 KW. It runs a gear box with three speeds, through a belt connection. $D_1=150mm D_2= 2D_1$. $Z_1=Z_2=30$teeth. The chuck diameter is 200 mm , its speeds are n_1 , n_2 , n_3 Equal 750, 500, and 250 r.p.m respectively. Design the set of sliding gears. And determine the three linear speeds of the chuck. $\Psi=14$, σu driver=53kg/mm², σu driven=44kg/mm²,Kd=1.3, $\epsilon=0$,$\alpha=20°$, and $d_1=63mm$.



This exam contributes "by measuring" in achieving Programme Academic Standards according to NARS															
Question Number	Q3	Q4	Q5			Q3	Q4	Q5			Q3	Q4	Q5		
Skills	a4-1,a1 9-1	a4-1,a1 9-1	a4-1			b17-1	b17-1	b16-1,b1 7-1			c1-1	c1-1	c1-1		
	Knowledge & Understanding Skills					Intellectual Skills					Professional Skills				

with best wishes Dr.H.Gaffer4 june2014