

Answer for Tutorial Problems**Tutorial Sheet 1**

1. 2.75 mm; **4.** 0.514mm, – 0.3 mm, – 1.928 mm; **5.** 142.05 MPa; **6.** 13.14 N/mm², 100.2 N/mm²; **7.** P/12, P/3, 7P/12; **8. a)** 201.79 N/mm², 72.65 N/mm², **b)** 0.106 mm; **9. a)** 1230.77 kg, 738.46 kg, **b)** 14269 kg (T), 31738 kg; **10.** 20 kN.

Tutorial Sheet 2

1. 207.23 GPa, 0.25, ...; **2. a)** – 0.0035 mm, **b)** 140 kN; **3.** 45 MN/m², 300.195 mm, 9.997 mm; **4.a)** – 12 μ m, – 18 μ m, **b)** 142.9 MPa; **5. a)** + 100 μ m, **b)** + 348 μ m, **c)** – 20.1 μ m, **d)** 2470 mm³; **6. a)** 168.75 μ , – 168.75 μ , 0, **b)** – 587.5 μ , 425 μ , 1349 μ .

Tutorial Sheet 3

1. 112.3 mm, 2.35; **2.** 49.37 kW; **3.** 1.7; **4.** (28TL)/(3 π d⁴G); **5.** 17.927 N/mm², 1.541°; **6.** 6.2 kNm; **7.** 75.5 Nm, 44.5 Nm; **8. i)** 17.472 N/mm², 27.597 N/mm², 2.054°.

Tutorial Sheet 5

1. i) 32.22 mm, 3142220 mm⁴, **ii)** 205.1 N/mm², 431.4 N/mm², **iii)** 292.4 kN, **v)** 67.25 mm; **2.** 900 kN; **3.** 8/9; **4.** 4; **5.** 43.84 N/mm² (on top); **6.** 29.65 MPa, 41.92 MPa; **7.** 86.42 MPa; **8. & 9. theory not discussed in class.**

Tutorial Sheet 6

1. 333.333 N; **3.** 55 kN; **6. b)** 4r/ π .

Tutorial Sheet 7

1. Beam top: 240 MN/m², 0, Beam NA: 0, 6 MN/m², Shaft: -10.2 MN/m², 122 MN/m²; **2. i)** 199.6 MN/m², 5.98 MN/m², **ii)** 30 MN/m², 110 MN/m²; **3. i)** 60, 20, 20, **ii)** 60.57, -46.57, 73.57, **iii)** 228.06, -28.06, 128.06, **iv)** 45.62, 4.38, 20.63 (all in N/m²); **4.** 54.74°; **5. i)** Strain: 0.00115145, -0.0001515, 0.0006515, Stress: 292.5323, 92.083, 100.2245 (all in N/m²); **6.** 38.6 MPa, -38.6 MPa, 14.3°; **7.** 43.56 MPa, -31.11 MPa, -30°.