

ΑΠΑΝΤΗΣΕΙΣ  
ΣΤΟΙΧΕΙΑ ΜΗΧΑΝΩΝ

20/6/2020

**ΘΕΜΑ Α**

A1. 1. γ, 2. στ, 3. ε, 4. α, 5. β

A2. α. Λ, β. Σ, γ. Λ, δ. Σ, ε. Σ

**ΘΕΜΑ Β**

B1. 1. ε, 2. γ, 3. δ, 4. α, 5. β

B2. Σελ. 142 7 χρήσεις κοχλιών

Σελ. 192 4 από τους 6 σκοπούς που επιτελούν τα έδρανα

**ΘΕΜΑ Γ**

Γ1. α.  $\tau_{επ} = Q / (\eta * A * \kappa * z) \rightarrow 1000 = 12560 / (1 * A * 1 * 4) \rightarrow 1000 = 12560 / (4 * A)$

$\rightarrow 1000 * 4 * A = 12560 \rightarrow 4000 * A = 12560 \rightarrow A = 12560 / 4000 = 3,14 \text{ cm}^2$

$A = (\pi * d^2) / 4 \rightarrow 3,14 = (\pi * d^2) / 4 \rightarrow 1 = d^2 / 4 \rightarrow d^2 = 4 \rightarrow d = \sqrt{4} = 2 \text{ cm} = 20 \text{ mm}$

β.  $d_1 = d + 1 \text{ mm} = 20 + 1 = 21 \text{ mm} = 2,1 \text{ cm}$

Γ2. α.  $F = 0,6 * d_1^2 * \sigma_{επ} \rightarrow 3140 = 0,6 * 2^2 * \sigma_{επ} \rightarrow 3140 = 0,6 * 4 * \sigma_{επ} \rightarrow 3140 = 2,4 * \sigma_{επ}$

$\rightarrow \sigma_{επ} = 3140 / 2,4 = 31400 / 24 \approx 1308,334 \text{ daN/cm}^2$

$$\beta. p_{\text{επ}} = F / \left\{ \left( \frac{\pi}{4} \right) \cdot (d^2 - d_1^2) \cdot z \right\} \rightarrow 200 = 3140 / \left\{ \left( \frac{3,14}{4} \right) \cdot (3^2 - 2^2) \cdot z \right\}$$

$$\rightarrow 200 = 3140 / (0,785 \cdot 5 \cdot z) \rightarrow 200 \cdot 0,785 \cdot 5 \cdot z = 3140 \rightarrow 785 \cdot z = 3140$$

$$\rightarrow z = 3140 / 785 = 4$$

### ΘΕΜΑ Δ

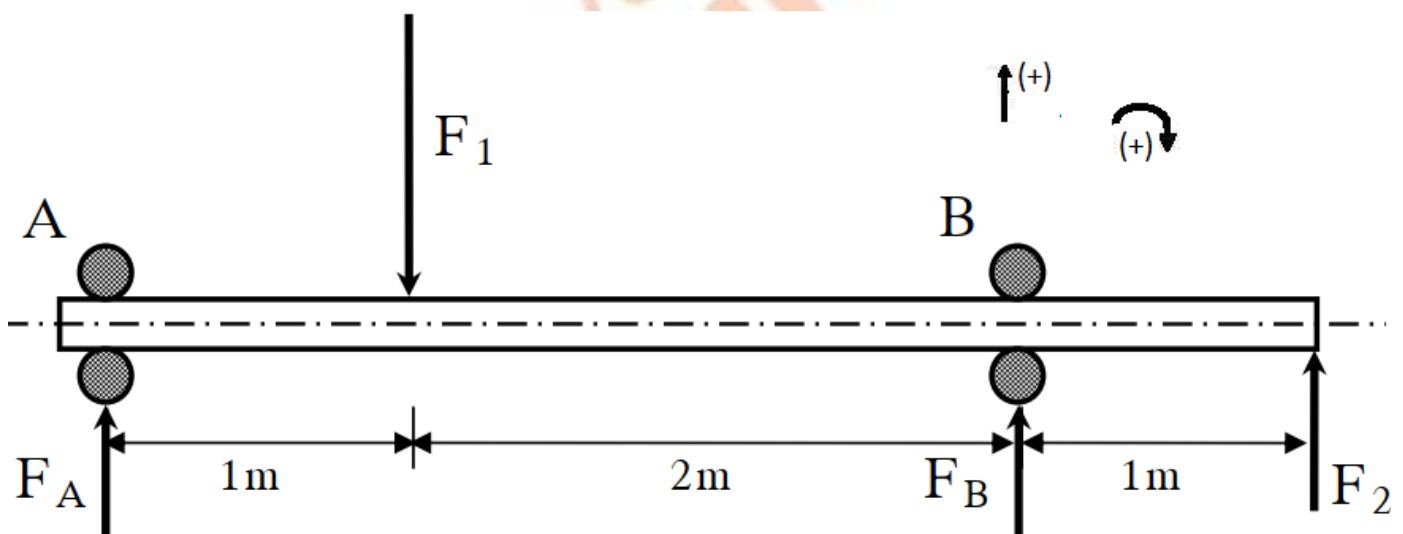
$$\Delta 1. \alpha. M_t = 71620 \cdot (P/n) \rightarrow 5000 = 71620 \cdot (50/n) \rightarrow n = 71620 \cdot (50/5000)$$

$$= 7162 \cdot (5/50) = 7162 \cdot 0,1 = 716,2 \text{ rpm}$$

$$\beta. M_t = 0,2 \cdot \tau_{\text{επ}} \cdot d^3 \rightarrow 5000 = 0,2 \cdot 200 \cdot d^3 \rightarrow 5000 = 2 \cdot 20 \cdot d^3 \rightarrow 5000 = 40 \cdot d^3$$

$$\rightarrow d^3 = 5000 / 40 = 125 \rightarrow d = 125^{1/3} = (5^3)^{1/3} = 5 \text{ cm}$$

Δ2.



α.

$$\Sigma M_A = 0 \rightarrow M_A + M_\Gamma + M_B + M_\Delta = 0 \rightarrow 0 + 700 \cdot 1 - F_B \cdot 3 - 100 \cdot 4 = 0$$

$$\rightarrow 700 - F_B \cdot 3 - 400 = 0 \rightarrow 300 - F_B \cdot 3 = 0 \rightarrow 300 = F_B \cdot 3 \rightarrow F_B = 300 / 3 = 100 \text{ daN}$$

$$\Sigma F_y = 0 \rightarrow F_A - 700 + 100 + F_B = 0 \rightarrow F_A - 700 + 100 + 100 = 0 \rightarrow F_A - 500 = 0 \rightarrow F_A = 500 \text{ daN}$$

β.

$$\frac{C_A}{F_1} = 10 \rightarrow \frac{C_A}{500} = 10 \rightarrow C_A = 500 \cdot 10 = 5000 \text{ daN} = 50000 \text{ N} \rightarrow A6312$$

$$\frac{C_B}{F_2} = 10 \rightarrow \frac{C_B}{100} = 10 \rightarrow C_B = 100 \cdot 10 = 1000 \text{ daN} = 10000 \text{ N} \rightarrow B16012$$