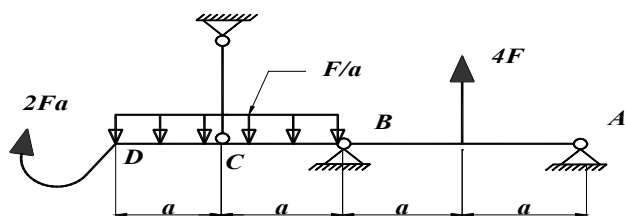


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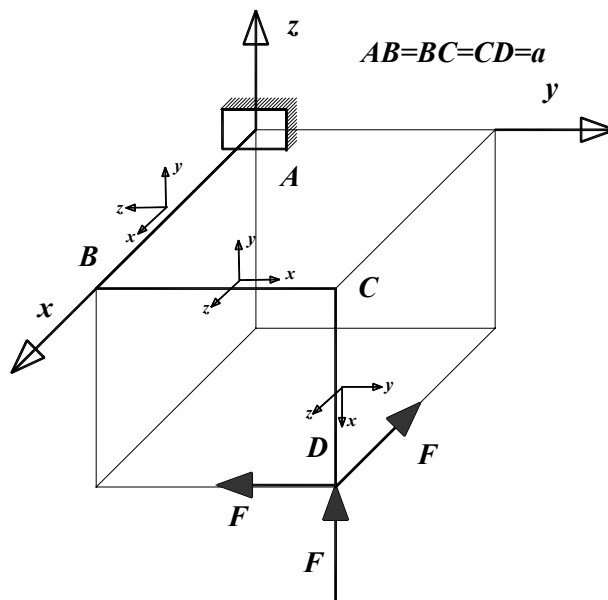
Usmeni (teorijski) deo ispita iz **TEHNIČKE MEHANIKE 1**
(pismeni održan 30.09.04.)

1.ZADATAK(uslovni 40%): Za date nosače i opterećenje nacrtati dijagrame sila u preseku:

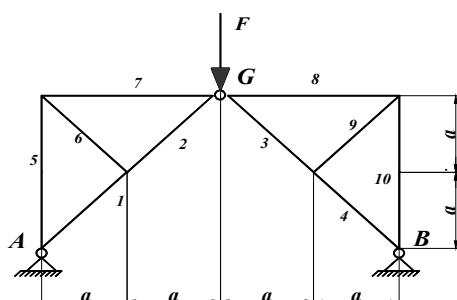
a)



b)

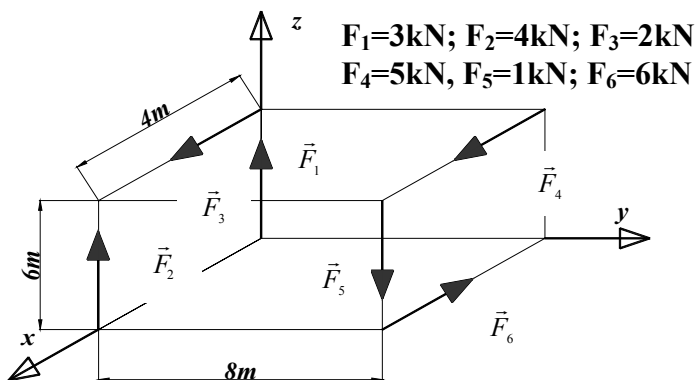


c)

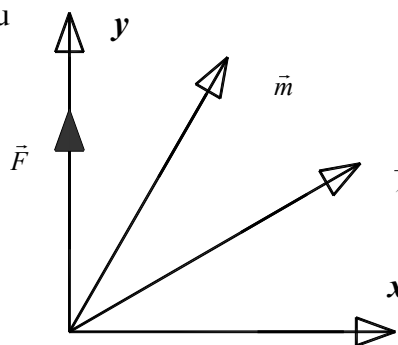


2.ZADATAK(35%=5+30): a)Navesti sve mogućnosti na šta se svodi proizvoljan sistem sila u prostoru redukcijom na proizvoljnu tačku?

b)Ispitati na šta se svodi dati sistem sila na slici redukcijom na koordinatni početak, zatim odrediti statičke invarijante; u slučaju rezultatne naći napadnu liniju rezultante a u slučaju diname naći jednačinu centralne ose?



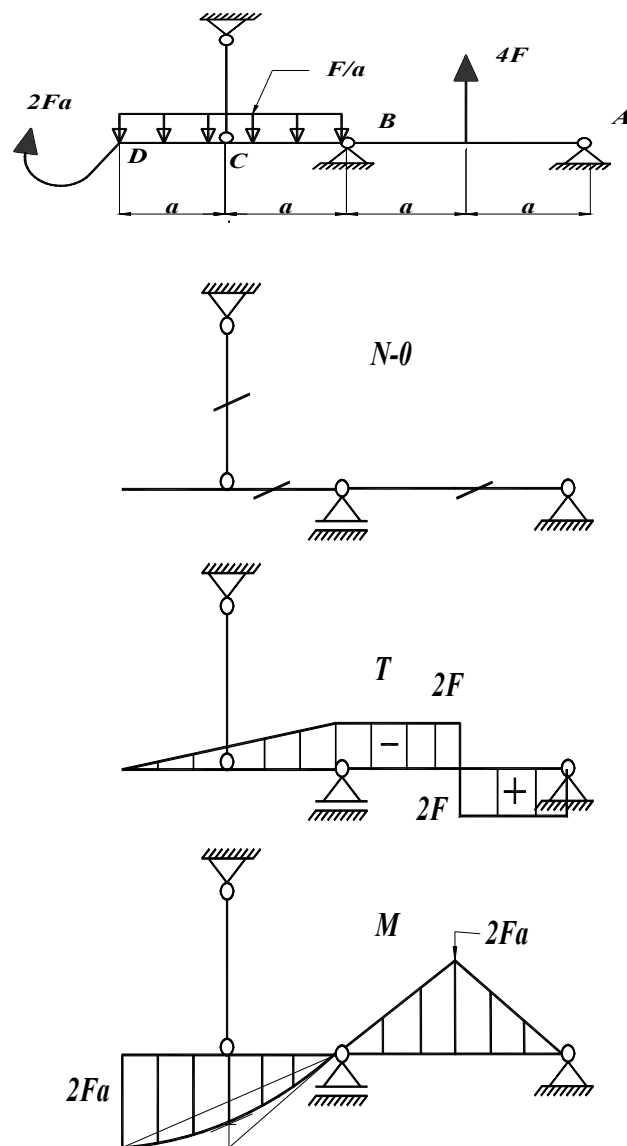
3.ZADATAK(25%): a) Objasniti razlaganje sile na komponente u ravni; b) Datu silu $\vec{F} = \{0; 7\} kN$ razložiti na komponente u odnosu na dva nekolinearna pravca u ravni $\vec{\ell} = \{\sqrt{3}/2; 1/2\}$, $\vec{m} = \{1/2; \sqrt{3}/2\}$;



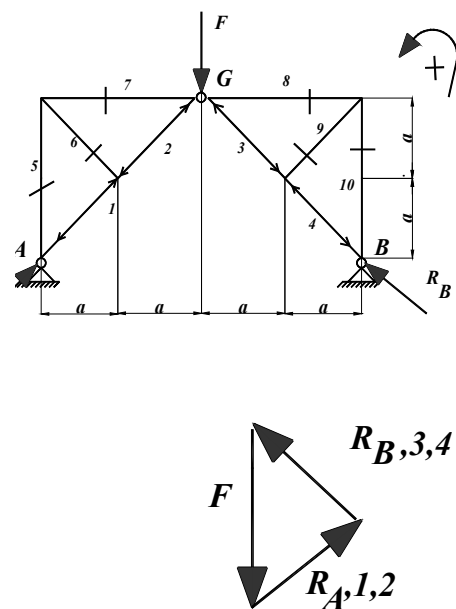
Usmeni (teorijski) deo ispita iz **TEHNIČKE MEHANIKE 1**
(pismeni održan 30.09.04.)

1.ZADATAK(uslovni 40%): Za date nosače i opterećenje nacrtati dijagrame sila u preseku:

a)

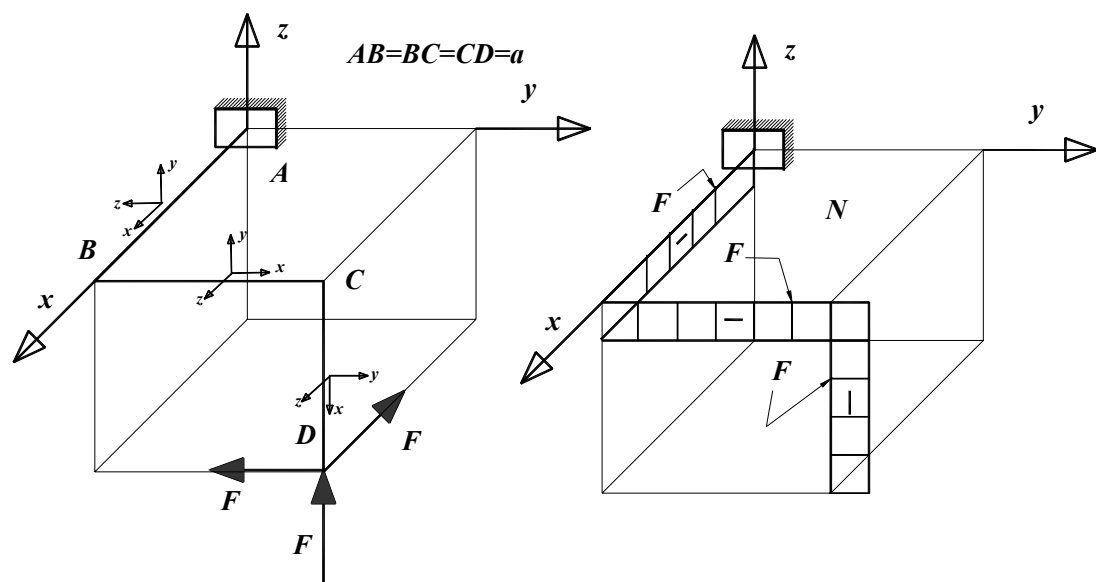


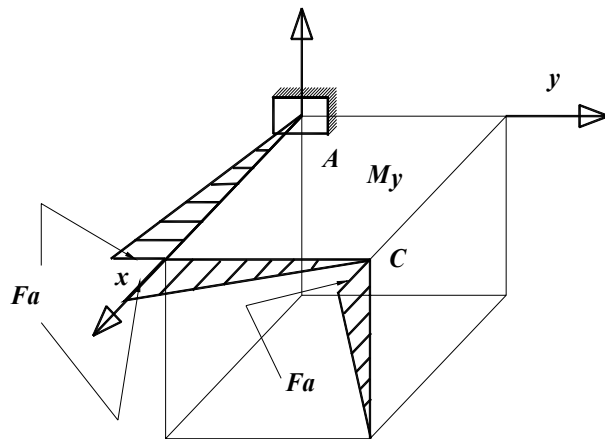
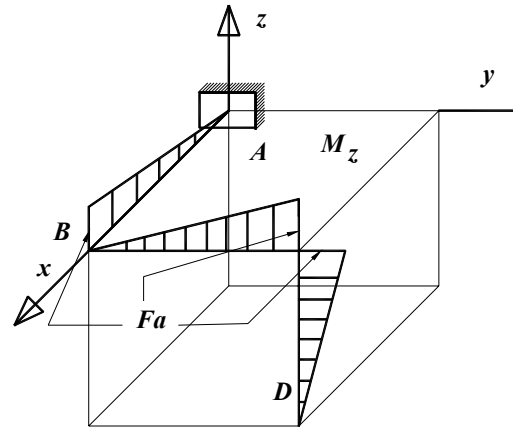
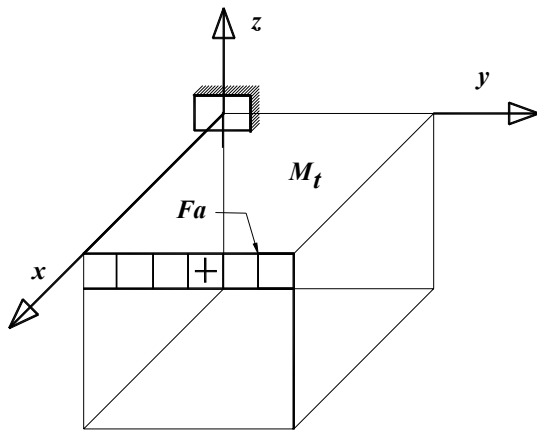
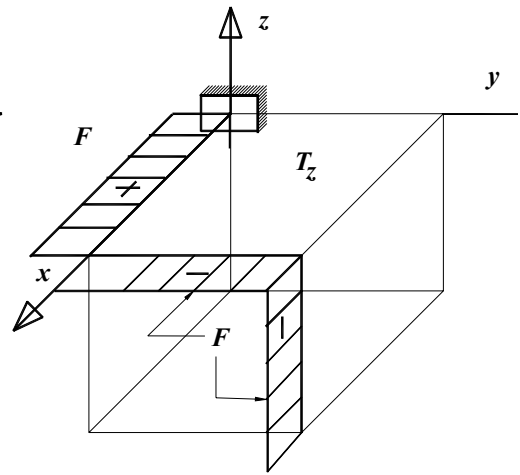
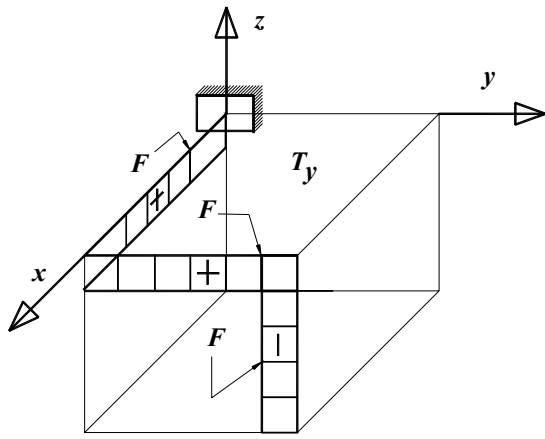
c)



ŠTAP	1	2	3	4
SILA	- 0.707F	- 0.707F	- 0.707F	- 0.707F

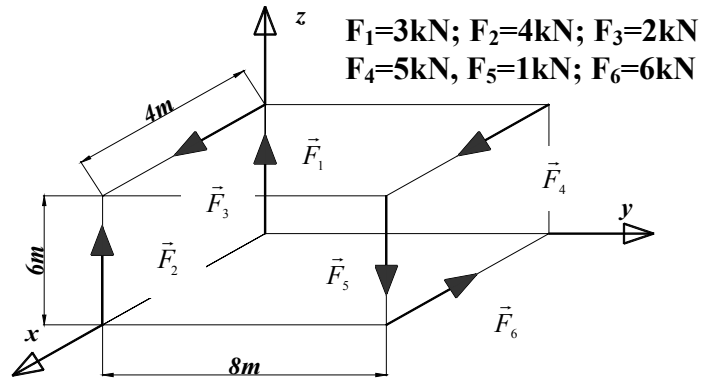
b)





2.ZADATAK(35%=5+30): a)Navesti sve mogućnosti na šta se svodi proizvoljan sistem sila u prostoru redukcijom na proizvoljnu tačku?

b)Ispitati na šta se svodi dati sistem sila na slici redukcijom na koordinatni početak, zatim odrediti statičke invarijante; u slučaju rezultantne naći napadnu liniju rezultante a u slučaju dinamne naći jednačinu centralne ose?



$$\vec{F}_1 = \{0;0;3\} \quad \vec{M}_1 = \{0;0;0\}$$

$$M_o = \frac{\vec{M}_R^{(o)} \cdot \vec{F}_R}{|\vec{F}_R|} = 6.578 kNm \rightarrow \text{DINAMA}$$

$$\vec{F}_2 = \{0;0;4\} \quad \vec{M}_2 = \{0;-16;0\}$$

$$\vec{M}_o = \{1.081;0;6.486\}$$

$$\vec{F}_3 = \{2;0;0\} \quad \vec{M}_3 = \{0;12;0\}$$

$$\vec{\mu}_R = \vec{M}_R^{(o)} - \vec{M}_o = \{-9.081;30;1.514\}$$

$$\vec{F}_4 = \{5;0;0\} \quad \vec{M}_4 = \{0;30;-40\}$$

$$\vec{F}_5 = \{0;0;-1\} \quad \vec{M}_5 = \{-8;4;0\}$$

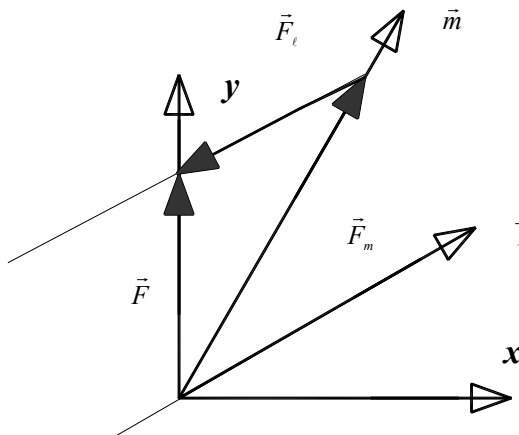
$$x + \frac{\mu_{Ry}^o}{Z_R} = \frac{y - \frac{\mu_{Rx}^o}{Z_R}}{Y_R} = \frac{z}{Z_R}$$

$$\vec{F}_6 = \{-6;0;0\} \quad \vec{M}_6 = \{0;0;48\}$$

$$\vec{F}_R = \{1;0;6\} \quad \vec{M}_R = \{-8;30;8\} \text{ kNm}$$

$$\frac{x+5}{1} = \frac{y+1.51}{0} = \frac{z}{6} \quad \text{JED. CENT. OSE.}$$

3.ZADATAK(25%): a) Objasniti razlaganje sile na komponente u ravni; b) Datu silu $\vec{F} = \{0;7\}$ kN razložiti na komponente u odnosu na dva nekolinearna pravca u ravni $\vec{\ell} = \{\sqrt{3}/2; 1/2\}$, $\vec{m} = \{1/2; \sqrt{3}/2\}$;



$$\vec{F} = F_l \cdot \vec{\ell} + F_m \cdot \vec{m} / \vec{i}, \vec{j}$$

$$X = F_l \cos \alpha_1 + F_m \cos \alpha_2$$

$$Y = F_l \cos \beta_1 + F_m \cos \beta_2$$

$$\Delta = \begin{vmatrix} \cos \alpha_1 & \cos \alpha_2 \\ \cos \beta_1 & \cos \beta_2 \end{vmatrix} = \begin{vmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{vmatrix} = \frac{1}{2} \neq 0$$

$$\Delta_1=\begin{vmatrix} X & \cos\alpha_2 \\ Y & \cos\beta_2 \end{vmatrix}=\begin{vmatrix} 0 & \frac{1}{2} \\ 7 & \frac{\sqrt{3}}{2} \end{vmatrix}=-\frac{7}{2} \qquad \Delta_2=\begin{vmatrix} \cos\alpha_1 & X \\ \cos\beta_1 & Y \end{vmatrix}=\begin{vmatrix} \frac{\sqrt{3}}{2} & 0 \\ \frac{1}{2} & 7 \end{vmatrix}=\frac{7\sqrt{3}}{2}$$

$$F_\ell=\frac{\Delta_1}{\Delta}=-7\,;F_m=\frac{\Delta_2}{\Delta}=7\sqrt{3}$$