



Nacionalni centar
za vanjsko vrednovanje
obrazovanja

Identifikacijska
naljepnica

PAŽLJIVO NALIJEPI TI

FIZ

FIZIKA
KNJIŽICA FORMULA
OGLEDNI ISPIT

DRŽAVNA MATURA 2021./2022.

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POPIS FORMULA I KONSTANTI

Kinematika

$$\bar{v} = \frac{\Delta s}{\Delta t}$$

$$\bar{a} = \frac{\Delta v}{\Delta t}$$

$$s = v_0 t + a \frac{t^2}{2}$$

$$v = v_0 + at$$

$$v^2 = v_0^2 + 2as$$

$$a_{\text{cp}} = \frac{v^2}{r}$$

$$f = \frac{1}{T}$$

Dinamika

$$F = ma$$

$$F_{\text{tr}} = \mu F_{\text{p}}$$

$$F_{\text{elas}} = kx$$

$$p = mv$$

$$F \Delta t = \Delta p$$

$$W = \Delta E$$

$$W = Fs \cos \alpha$$

$$E_{\text{k}} = \frac{mv^2}{2}$$

$$\Delta E_{\text{gp}} = mg \Delta h$$

$$E_{\text{ep}} = k \frac{x^2}{2}$$

$$P = \frac{W}{t}$$

$$F_{\text{G}} = G \frac{m_1 m_2}{r^2}$$

Hidromehanika

$$p = \frac{F}{S}$$

$$p = \rho gh$$

$$F_{\text{u}} = \rho g V$$

$$S_1 v_1 = S_2 v_2$$

$$p_1 + \frac{\rho v_1^2}{2} = p_2 + \frac{\rho v_2^2}{2}$$

$$\rho = \frac{m}{V}$$

Termodinamika

$$n = \frac{N}{N_A} = \frac{m}{M} \quad \overline{E_k} = \frac{3}{2} k_B T \quad U = \frac{3}{2} N k_B T \quad pV = nRT$$

$$l = l_0(1 + \alpha \Delta t) \quad Q = mc\Delta t \quad Q_t = m\lambda \quad Q_i = mr$$

$$Q = W + \Delta U \quad W = p\Delta V \quad \eta = 1 - \frac{T_2}{T_1}$$

Elektricitet i magnetizam

$$F = \frac{k}{\epsilon_r} \frac{q_1 q_2}{r^2} \quad k = \frac{1}{4\pi\epsilon_0} \quad F = qE \quad E = \frac{k}{\epsilon_r} \frac{q}{r^2}$$

$$W = qU \quad U = Ed \quad \varphi = \frac{k}{\epsilon_r} \frac{q}{r} \quad C = \frac{q}{U}$$

$$C = \epsilon_0 \epsilon_r \frac{S}{d} \quad W = \frac{CU^2}{2} \quad I = \frac{\Delta q}{\Delta t} \quad I = \frac{U}{R}$$

$$R = \rho \frac{l}{S} \quad I = \frac{\mathcal{E}}{R_u + R_v} \quad P = UI \quad B = \mu_0 \mu_r \frac{I}{2r\pi}$$

$$B = \mu_0 \mu_r \frac{NI}{l} \quad F = BIl \sin \alpha \quad F_L = qvB \sin \alpha \quad \Phi = BS \cos \alpha$$

$$U_i = -N \frac{\Delta \Phi}{\Delta t} \quad U_i = -Blv \sin \alpha \quad I = \frac{U}{Z} \quad R_L = L\omega$$

$$R_C = \frac{1}{C\omega} \quad Z = \sqrt{R^2 + (R_L - R_C)^2}$$

Titranje i valovi

$$T = 2\pi\sqrt{\frac{m}{k}}$$

$$T = 2\pi\sqrt{\frac{l}{g}}$$

$$T = 2\pi\sqrt{LC}$$

$$\omega = \frac{2\pi}{T}$$

$$x = A \sin(\omega t + \varphi_0)$$

$$v = v_0 \cos(\omega t + \varphi_0)$$

$$v_0 = \frac{2\pi A}{T}$$

$$v = \frac{\lambda}{T}$$

$$a = -a_0 \sin(\omega t + \varphi_0)$$

$$a_0 = \frac{4\pi^2 A}{T^2}$$

$$y = A \sin\left(\omega t - \frac{2\pi x}{\lambda}\right)$$

$$L = 10 \log \frac{I}{I_0}$$

$$f_p = f_i \frac{v + v_p}{v - v_i}$$

$$I = \frac{P}{S}$$

Optika

$$n = \frac{c}{v}$$

$$\frac{\sin \alpha}{\sin \beta} = \frac{n_2}{n_1}$$

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{f}$$

$$\frac{y'}{y} = -\frac{b}{a}$$

$$f = \frac{R}{2}$$

$$j = \frac{1}{f}$$

$$\lambda = \frac{sd}{a}$$

$$d \sin \alpha_k = k\lambda$$

$$\operatorname{tg} \alpha_B = n$$

Moderna fizika

$$L = L_0 \sqrt{1 - \frac{v^2}{c^2}}$$

$$T = \frac{T_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$E_f = hf$$

$$E_k = E_f - W_i$$

$$\lambda = \frac{h}{p}$$

$$E_f = E_n - E_m = -13,6 \text{ eV} \left(\frac{1}{n^2} - \frac{1}{m^2} \right); \quad n > m$$

$$E = \Delta mc^2$$

$$N = N_0 2^{-\frac{t}{T}} = N_0 e^{-\lambda t}$$

$$\lambda = \frac{\ln 2}{T}$$

$$A = \lambda N$$

Konstante

| | |
|---|--|
| gravitacijska konstanta | $G = 6,67 \cdot 10^{-11} \text{ Nkg}^{-2}\text{m}^2$ |
| ubrzanje slobodnoga pada pri površini Zemlje | $g = 9,81 \text{ ms}^{-2}$ (u zadacima uzeti 10 ms^{-2}) |
| masa Zemlje | $M = 6 \cdot 10^{24} \text{ kg}$ |
| polumjer Zemlje | $R = 6370 \text{ km}$ |
| normirani atmosferski tlak | $p_a = 101325 \text{ Pa}$ |
| unificirana atomska masa | $u = 1,66 \cdot 10^{-27} \text{ kg}$ |
| Avogadrova konstanta | $N_A = 6,022 \cdot 10^{23} \text{ mol}^{-1}$ |
| opća plinska konstanta | $R = 8,314 \text{ JK}^{-1}\text{mol}^{-1}$ |
| brzina svjetlosti u vakuumu | $c = 3 \cdot 10^8 \text{ ms}^{-1}$ |
| elementarni naboj | $e = 1,6 \cdot 10^{-19} \text{ C}$ |
| masa elektrona | $m_e = 9,11 \cdot 10^{-31} \text{ kg}$ |
| masa protona | $m_p = 1,67 \cdot 10^{-27} \text{ kg}$ |
| Coulombova konstanta | $k = 9 \cdot 10^9 \text{ Nm}^2\text{C}^{-2}$ |
| permitivnost vakuumu | $\varepsilon_0 = 8,85 \cdot 10^{-12} \text{ Fm}^{-1}$ |
| permeabilnost vakuumu | $\mu_0 = 4\pi \cdot 10^{-7} \text{ NA}^{-2}$ |
| prag čujnosti | $I_0 = 10^{-12} \text{ Wm}^{-2}$ |
| Boltzmannova konstanta | $k_B = 1,38 \cdot 10^{-23} \text{ JK}^{-1}$ |
| Planckova konstanta | $h = 6,626 \cdot 10^{-34} \text{ Js}$ |

Periodni sustav elemenata IUPAC

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|-------------------|-------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 H 1,01 | | 2 He 4,00 | | | | | | | | | | | | | | | |
| 3 Li 6,94 | 4 Be 9,01 | | | | | | | | | | | | | | | | |
| 11 Na 23,0 | 12 Mg 24,3 | | | | | | | | | | | | | | | | |
| 19 K 39,1 | 20 Ca 40,1 | 21 Sc 45,0 | 22 Ti 47,9 | 23 V 50,9 | 24 Cr 52,0 | 25 Mn 54,9 | 26 Fe 55,8 | 27 Co 58,9 | 28 Ni 58,7 | 29 Cu 63,5 | 30 Zn 65,4 | 31 Ga 69,7 | 32 Ge 72,6 | 33 As 74,9 | 34 Se 79,0 | 35 Br 79,9 | 36 Kr 83,8 |
| 37 Rb 85,5 | 38 Sr 87,6 | 39 Y 88,9 | 40 Zr 91,2 | 41 Nb 92,9 | 42 Mo 95,9 | 43 Tc [98] | 44 Ru 101 | 45 Rh 103 | 46 Pd 106 | 47 Ag 108 | 48 Cd 112 | 49 In 115 | 50 Sn 119 | 51 Sb 122 | 52 Te 128 | 53 I 127 | 54 Xe 131 |
| 55 Cs 133 | 56 Ba 137 | 57-71 lantanoidi | 72 Hf 178 | 73 Ta 181 | 74 W 184 | 75 Re 186 | 76 Os 190 | 77 Ir 192 | 78 Pt 195 | 79 Au 197 | 80 Hg 201 | 81 Tl 204 | 82 Pb 207 | 83 Bi 209 | 84 Po [209] | 85 At [210] | 86 Rn [222] |
| 87 Fr [223] | 88 Ra [226] | 89-103 aktinoidi | 104 Rf [261] | 105 Db [262] | 106 Sg [266] | 107 Bh [264] | 108 Hs [277] | 109 Mt [268] | 110 Ds [269] | 111 Rg [272] | 112 Cn [285] | | | | | | |
| | | | | | | | | | | | | | | | | | |
| 57 La 139 | 58 Ce 140 | 59 Pr 141 | 60 Nd 144 | 61 Pm [145] | 62 Sm 150 | 63 Eu 152 | 64 Gd 157 | 65 Tb 159 | 66 Dy 163 | 67 Ho 165 | 68 Er 167 | 69 Tm 169 | 70 Yb 173 | 71 Lu 175 | | | |
| 89 Ac [227] | 90 Th 232 | 91 Pa 231 | 92 U 238 | 93 Np [237] | 94 Pu [244] | 95 Am [243] | 96 Cm [247] | 97 Bk [247] | 98 Cf [251] | 99 Es [252] | 100 Fm [257] | 101 Md [258] | 102 No [259] | 103 Lr [262] | | | |

Prazna stranica

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