



Nacionalni centar
za vanjsko vrednovanje
obrazovanja

Identifikacijska
naljepnica

PAŽLJIVO NALIJEPI

FIZIKA

PROBNI ISPIT DRŽAVNE MATURE
šk. god. 2023./2024.

KNJIŽICA FORMULA

FIZ.57.HR.R.T1.08



57240

POPIS FORMULA I KONSTANTI

Kinematika

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

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

$$s = v_0 t + \frac{1}{2} a t^2$$

$$v = v_0 + a t$$

$$v^2 = v_0^2 + 2 a s$$

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

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

Dinamika

$$a = \frac{F}{m}$$

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

$$F_{\text{elas}} = k x$$

$$p = m v$$

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

$$W = \Delta E$$

$$W = F s \cos \alpha$$

$$E_{\text{k}} = \frac{m v^2}{2}$$

$$\Delta E_{\text{gp}} = m g \Delta h$$

$$E_{\text{ep}} = \frac{1}{2} k x^2$$

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

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

Hidromehanika

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

$$p = \rho g h$$

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

$$S_1 v_1 = S_2 v_2$$

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

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

Termodinamika

$$n = \frac{N}{N_A} = \frac{m}{M}$$

$$\overline{E_k} = \frac{3}{2} k_B T$$

$$U = \frac{3}{2} N k_B T$$

$$pV = nRT$$

$$\ell = \ell_0 (1 + \alpha \Delta t)$$

$$Q = mc \Delta t$$

$$Q_t = m \lambda$$

$$Q_i = m r$$

$$Q = W + \Delta U$$

$$W = p \Delta V$$

$$\eta = 1 - \frac{T_2}{T_1}$$

Elektricitet i magnetizam

$$F = \frac{k}{\epsilon_r} \frac{q_1 q_2}{r^2}$$

$$E = \frac{F}{q}$$

$$E = \frac{k}{\epsilon_r} \frac{q}{r^2}$$

$$W = qU$$

$$E = \frac{U}{d}$$

$$\varphi = \frac{k}{\epsilon_r} \frac{q}{r}$$

$$C = \frac{q}{U}$$

$$C = \epsilon_0 \epsilon_r \frac{S}{d}$$

$$W = \frac{CU^2}{2}$$

$$I = \frac{\Delta q}{\Delta t}$$

$$I = \frac{U}{R}$$

$$R = \rho \frac{\ell}{S}$$

$$I = \frac{\mathcal{E}}{R_u + R_v}$$

$$P = UI$$

$$B = \mu_0 \mu_r \frac{I}{2r\pi}$$

$$B = \mu_0 \mu_r \frac{NI}{\ell}$$

$$F = BI \ell \sin \alpha$$

$$F_L = qvB \sin \alpha$$

$$\Phi = BS \cos \alpha$$

$$U_i = -N \frac{\Delta \Phi}{\Delta t}$$

$$U_i = -B \ell v \sin \alpha$$

$$I = \frac{U}{Z}$$

$$R_L = L \omega$$

$$R_C = \frac{1}{C \omega}$$

$$Z = \sqrt{R^2 + (R_L - R_C)^2}$$

Titranje i valovi

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Optika

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

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

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

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

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

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

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

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

Moderna fizika

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

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

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

$$E_f = hf$$

$$E_f = W_i + E_k$$

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

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

$$E = \Delta mc^2$$

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

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

$$A = \lambda N$$

Konstante

gravitacijska konstanta	$G = 6,67 \cdot 10^{-11} \text{ N kg}^{-2} \text{ m}^2$
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	$\epsilon_0 = 8,85 \cdot 10^{-12} \text{ F m}^{-1}$
permeabilnost vakuumu	$\mu_0 = 4\pi \cdot 10^{-7} \text{ T m A}^{-1}$
prag čujnosti	$I_0 = 10^{-12} \text{ W m}^{-2}$
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

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

Prazna stranica

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