lZdepm ke^ml jZaheZZv \ hlql_ gihkj^lk\ggh
ihke_ l_dkZ , \ dhljlf hgZ nihfhgZlky \i_j\u_ , lob gZ
ke^nsc kljZgp_ .

CZ \k_ lZdepu ^he`gu [uv kaeob \ hlql_ . Ijb kaed_
ke^ml ihkZv kehh «lZe .1» k ndZZgf _ gfjZ .

lZdepu , aZ bdexqgbf lZdep ijlehì_gbc , ke^ml
gfnjhZv ZZldfb pnjZb kdhagbc gfnjZpbc lob
^inkdZlky gfnjhZv lZdepu \ ij^_eZo jZa^eZ . < vlf
kaeqZ_ gfj lZdepu kdkhb la gfjZ jZa^eZ b ihjy^dhlh
gfjZ lZdepu , jZa^_eggo lhqbc .

lZdepu cZ^lh ijlehì_gby hlhagZZl hl^_evgbc
gfnjZpbc ZZldfb pnjZb k ^lZe_gbf i_j^ pnjhc
hlhagZqgby ijlehì_gby .

Nhjfmeu ke_^ml \u^_eyl v ba l_dkl Z \ hl^_evgmx kljhdm
<ur_ b gì_ dZ^bc nhjfmeu lob njZggby ^he`gh [uv
hlZegh g_ f_g_ h^gbc kl[h^gbc kljlob . ? kob njZggb_ g_
nfsZlky \ h^gmkljhdm , lh hgh ^he`gh [uv i_j_g_kgh ihke_
agZZ jZ_gl\Z (=) lob ihke_ agZ^h iekk (+), flgha (-),
nfgì_gby (o), ^_egby (:), lob ^jnjlo fZ_fZbqkdo agZ^h ,
ijlqf agZl \ gZZe_ ke^nsc kljlob ih\lljyxl . Ijb
i_j_gk_ nhjfmeu gZ agZl_ , kf\lebajnsf ihjZpbx
nfgì_gby , ijlf_gyxl agZl «O».

Ihylgg_ agZqgbc kf\leh b qkehuo dwmpb_gh\
ke^ml ijl\h^lv gihkj^lk\ggh ih^ nhjfmebc \ lhc `_
ihke_^hZ_egkkb , \ dhljhc lgb ^Zgu \ nhjfme_ .

Nhjfmeu \ hlql_ ke^ml gfnjh\Zv ihjy^dhlc
gfnjZpbc \ ij^_eZo \k_h hlqlZ ZZldfb pnjZb \
qnhuo kdqdZo \ qjZgf ijZf ihehì_gb gZ kljld_ .

Kkuedb \ l_dkl_ gZ ihjy^dh\u_ ghf_jZ nhjfme ^
kdqdZo .

>hinkdZlky gfnjZpby nhjfme \ ij^_eZo jZa^eZ . < vlf
kaeqZ_ gfj nhjfmeu kdkhb la gfjZ jZa^eZ b ihjy^dhlh
gfjZ nhjfmeu , jZa^_eggo lhqbc , gZjf_j (3.1).

Kkuedb gZ bihevh\Zgu_ bkhqgbb ke^ml ijl\h^lv \
dZjZgo kdqdZo . K^gby lq[bkhqgdZo ke^ml
jZaheZZv \ ihjy^l_ ihy^egby kaeku gZ bkhqgbb \ l_dkl_
hlqlZ b gfnjh\Zv ZZldfb pnjZb [_a lhqb b i_qZZv k
Z_aZqgh hkkuiZ .

Ijbeh_gby hmjfeyl dZd ijh^he_gb_ hlqlZ gZ
ih^he_nsbo _]h ebkZo . < l_dk_ hlqlZ gZ \k_ ijbeh_gby
^he`gu [uv ^Zgu kaeb . Ijbeh_gby jZbhe]ZZl \ ihjy^d_
kaedl gZ_gbo \ l_dk_ . lZZ^h_ ijbeh_gb_ ke_^ml gZdgZv k
g\hc kijZgpu k ndZ^fbf gZ_jcm kijZZ kijZgpu ke\Z
@Ijbeh_gb_ » b _]h gf_j b ijbeh_gb_ ^he`gh lf_lv
a]he\ld .
>hndZlky h[hagZqgb_ ijbeh_gbc [ndZb e]gkdjh
Ze]ZblZ , aZ_bdexqgbf [nd l bO.
< kaqZ_ ihgjh bkievh\Zgy [nd jnkdjh b e]gkdjh
Ze]Zblh ^hndZlky h[hagZqv ijbeh_gby]Zqkdfb
pbnjZb .
? keb \ ^ndfhd_ h^gh ijbeh_gb_ , hgh h[hagZqlky
@Ijbeh_gb_ : ».
Ijbeh_gby ^he`gu lf_lv h[sxa k hkZe\gbc qZlvx
^ndfhdZ kdhagxa gfhjZpbx kijZgp .
<ghjb ingdlh fh]jn [uv ijb\^gu i_jqhe_gby .
I_j^ dZ^f i_jqhe_gbf ke_^ml kZbv ^_nk beb ,
ijb gh[dnbfkb kaeb \ l_dk_ ^ndfhdZ gZ h^gh ba
i_jqhe_gbc , kjhagxa [ndm (aZ_bdexqgbf z , a, h, l, v, c, u,
t), ih^he_ dhjbc kZbky kdh[dZ .
>ey ^Zegbc_c ^l]ebaZbb i_jqhe_gbc g[h[dnfh
bkievh\Zv]Zqkdb_ pbnju , ih^he_ dhjuo kZbky kdh[dZ , Z
aZbv ijbba\hbky k]aqg]h hlkniZ , dZd ihdZgh \
ijbf_j .

Ijbf_j

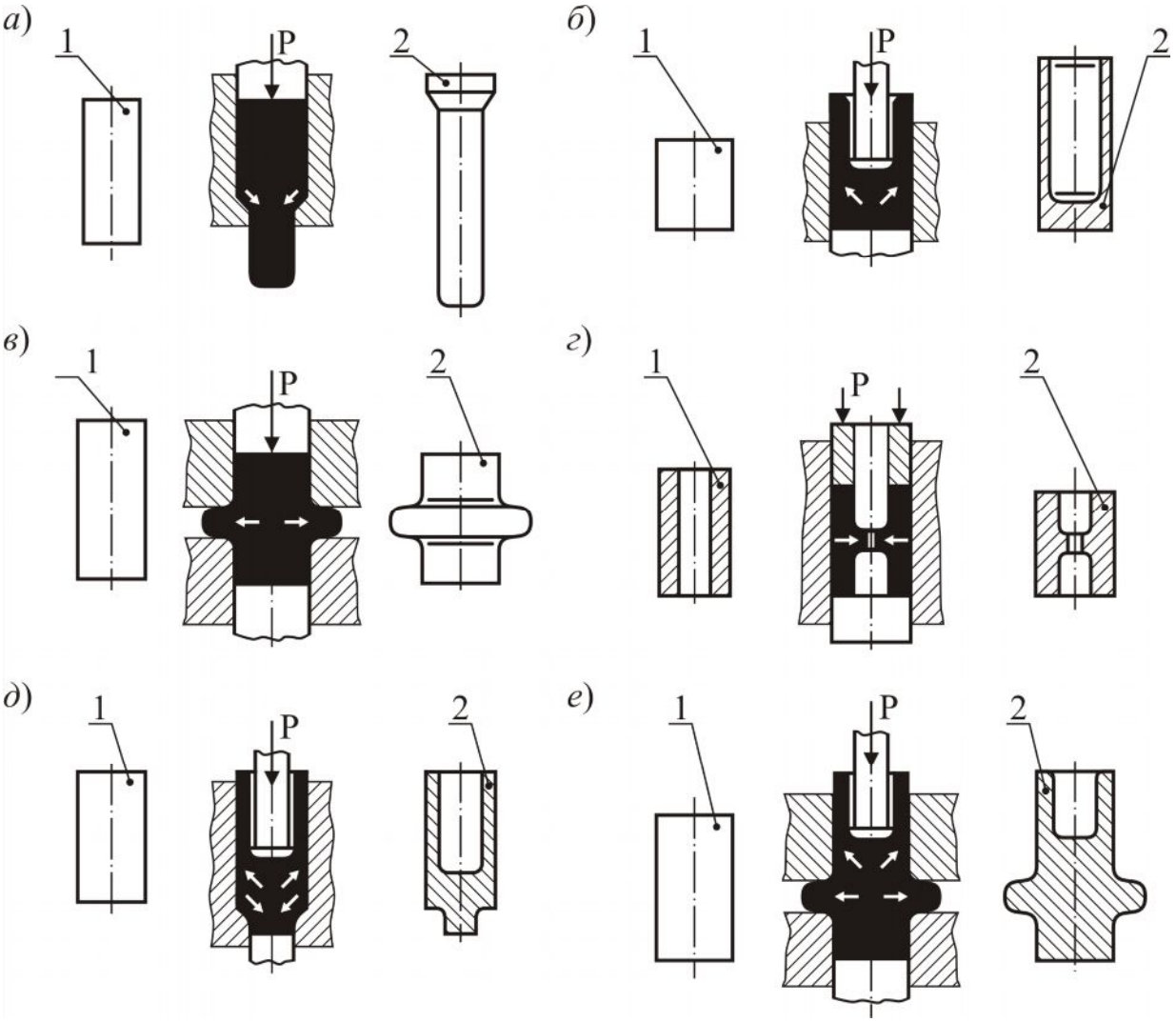
Z) _____;

[) _____ :

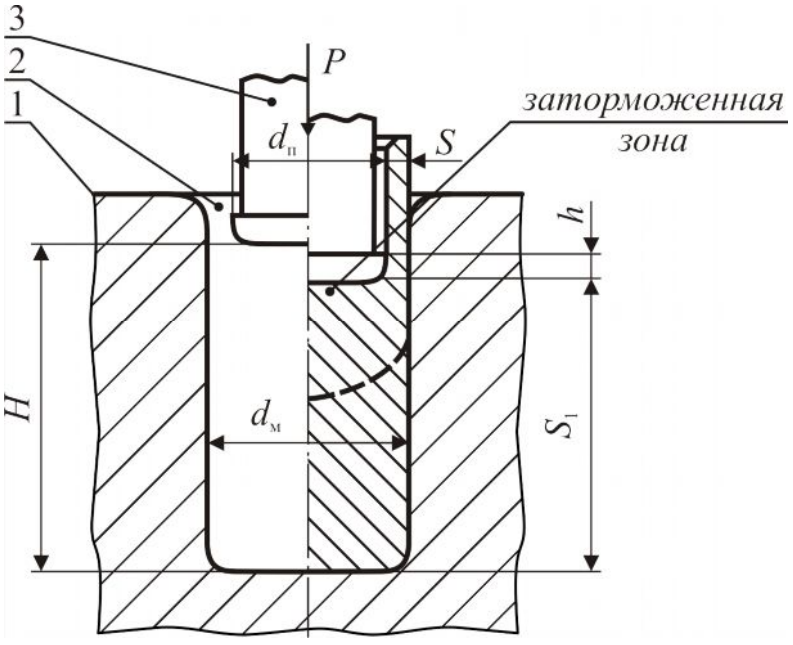
1) _____;

2) _____ ;

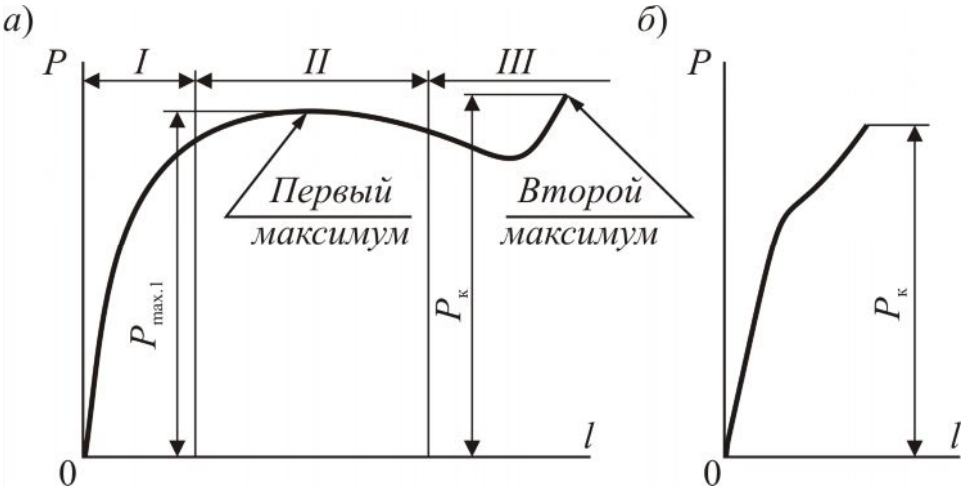
\) _____ .


а)
1
P
2
б)
1
P
2
в)
1
P
2
г)
1
P
2
д)
1
P
2
е)
1
P
2

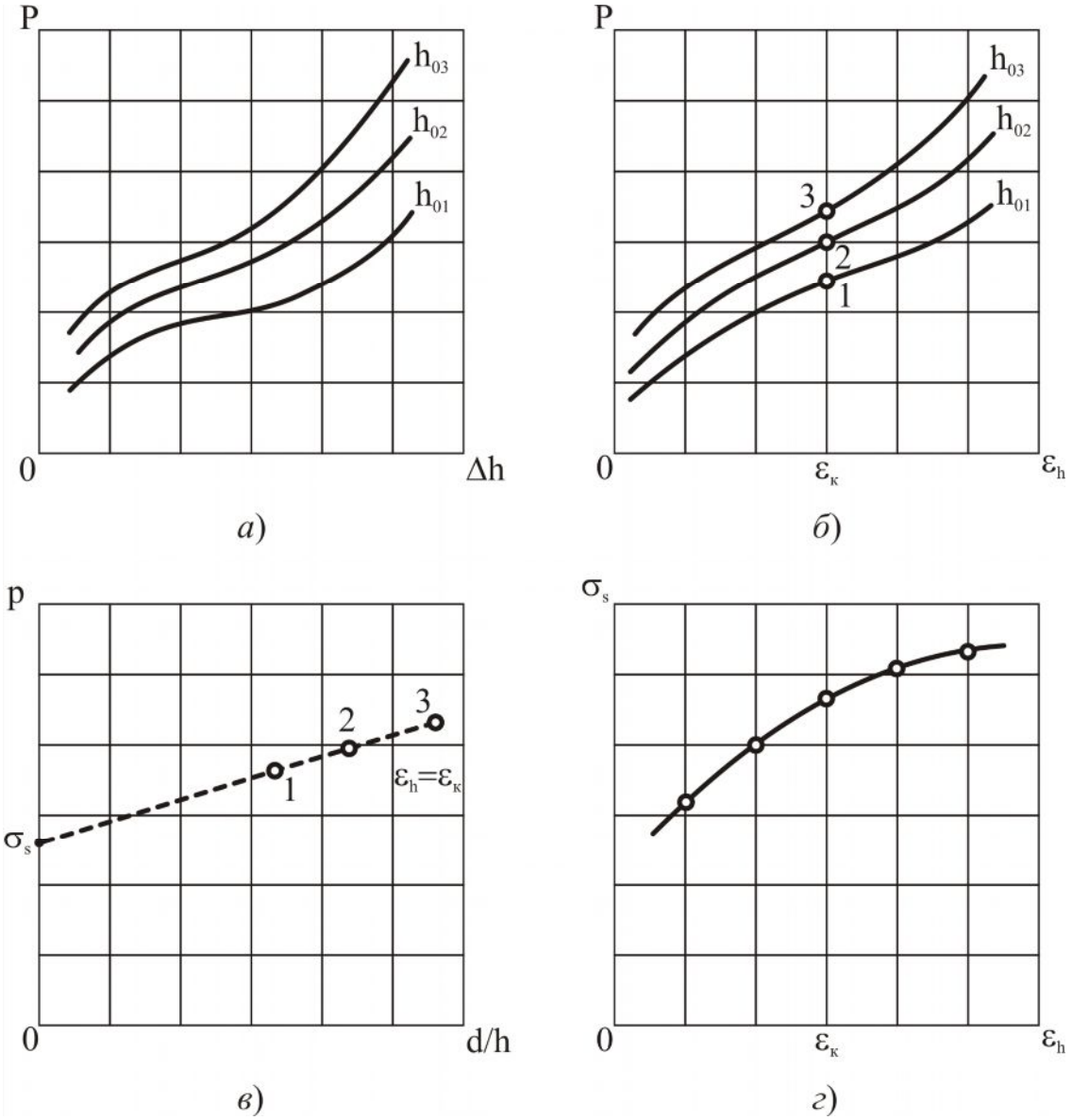
Jkl .1


3
2
1
P
$d_п$
S
заторможенная
зона
h
H
$d_м$
S_1

Jkl .2


а)
б)
P
I
II
III
Первый максимум
Второй максимум
$P_{max.1}$
$P_к$
l
0

Jkl .3


P
h_{03}
h_{02}
h_{01}
Δh
0
а)
$ε_к$
$ε_h$
б)
p
$σ_s$
1
2
3
$ε_h=ε_к$
d/h
в)
$σ_s$
г)

Jkl .4

E b l _ j Z l m j Z

1. =HK 7.32. Hq_l h gZgh lke^hZ_ekdc jZl_ . Kjdmj Z b ijZeZ hmfegy . Hgkd : F`]hmZk\ gc lh_l ih lZgZ]lbaqbb , f_jeh]b b kjlbobqbb , 2001.

2. = HK 1497-84. F _ l .Z e e F u l h ^ u b k i u l Z g b jZky`gb_ . F.: BaZ_ekh lZgZ]lh , 1985.

3. Hfjgh : ey\ = : . Hkjhlbegb_ fZ_jbZh ieZlqkdfm ^_hfbjhZgx . 3-_ ba^., i_j jZ . b ^i . E: Ehgkjhgb_ , 1978. 368k

4. Hfjgh : ey\ = : ., Qbh^kdc < I . Vkijf_gZevu lke^hZy \ kjZlkd f_Zeh ^Zegbf . E: Ehgkjhgb_ , 1972. 360k

5. =HK 25.503-97. F_lh^ bkuZgy gZ k`Zb_ . F.: BaZ_ekh lZgZ]lh , 1997.

6. Hfjgh : ey\ = : . Hkjhlbegb_ fZ_jbZh ieZlqkdfm ^_hfbjhZgx . 2-_ ba^., i_j jZ . b ^i . E: Ehgkjhgb_ , 1961. 463k

7. Ijnhgh FB . Hke^hZb \ hpeZb l_jb dehgjh eblhjh jlZ // Ch_ \ dmgcgh nZihgo p_oZ Egjj_Z . E: EKL , 1958. K154-177.

8. Mgkh ? I . Bg_gjgy l_jby ieZlqhkb . - F.: Ehfba , 1959. 328k

KH>? J@ GB?

<^gb 4

1. Hij^egb ngplhgZegc aZhkfkb "Bglglbglkv gZjy`gc (1) –
lglglbglkv ^ijfZpb (0) flZeh bkeZh ih j_ehZZ hkdZgy
phdg`jlqkdo lhjZqh jZky`gbf 6

1.1. AZZdp jZhu 6

1.2. Hkj`Zgb bikeh^hZegkv \uhegsgy aZZgy 6

1.3. Ijhplk jZky`gy phdg`jlqkdjh lhjZqZ 7

1.3.1. Hghgu aZhkfkb 7

1.4. :iijhdkfZpy aZhkfkb 1 ¡ š0 13

1.5. GZZjbkbo f_ZqkdoHkdl\ fZjbeZ , hij^eyfu ih j_ehZZ
hkdZgy jZky`gbf 15

1.6. <uhegsgb vdijlfglZbhjZhdZ]h j_ehZh 17

1.7. Hfjmh\Zgb , ijlhju , hgkjnfgl , hjZqu , fZjbZu , glhdhfu ^ey
\uhegsgy aZZgy 21

1.8. MZZgy ih hkhZegx hlqlZ 21

1.9. <hijhku ^ey kZdhgjkey 21

2. Hij^egb ngplhgZegc aZhkfkb «Bglglbglkv gZjy`gc (1) –
lglglbglkv ^ijfZpb (0)» flZeh bkeZh ih j_ehZZ hkdZgy
phdg`jlqkdo lhjZqh kZbf 23

2.1. AZZdp jZhu 23

2.2. Hkj`Zgb bikeh^hZegkv \uhegsgy aZZgy 23

2.3. Flhfub ikhjhgy ^ZjZfu 1 ¡– 0 24

2.3.1. Hkdl\b phdg`jlqkdo lhjZqh gZkZb\ khh_lk\b k=HK 25.503-97 [5] 25

2.3.2. Hkdl\b phdg`jlqkdo lhjZqh gZkZb ih flhfu = : Hkjgh\Z:ey\Z [6] 26

2.4. <uhegsgb vdijlfglZbhjZhdZ]h j_ehZh 30

2.5. Hfjmh\Zgb , ijlhju , hgkjnfgl , hjZqu , fZjbZu , glhdhfu ^ey
\uhegsgy aZZgy 31

2.6. MZZgy ih hkhZegx hlqlZ 32

2.7. <hijhku ^ey kZdhgjkey 32

3. VdijlfglZehgh bkeh^hZgb ^ijfjh\Zgjh b gZjy`gjh khhhgdc
gZjnhdc ih_jqgkkb ba]hZfhc ekkh\hc aZjhh\db 33

3.1. AZZdp jZhu 33

3.2. Hkj`Zgb bikeh^hZegkv \uhegsgy aZZgy , hdhgu ^Zgu 33

3.3. K^gy ba l_jb ijhplkZ ba]hZ ekkh\jh fZjbZeZ . Nfjhu ^ey jZqlZ nkeby
^ijfjh\Zgy 34

3.4. Flhu Z bke^hZ by gZjy`gh ^rjftjh\Zgjh kkhgdy gZrhgc
ih\jqgkkb aZjhhdb 38

3.5. <uleggb_ vdi jtf gZ b kjZjhdZ_h j_aulZh 42

3.6. Hfjrh\Zb_ , ijtfhju , bgkjrfgdu , fZ_jbZu , g[jdhfu_ ^ey \uleggdy
vdi jtf gZ 44

3.7. MZZdy ih kkhZeg x kqlZ 45

3.8. <ijkku ^ey kZdhgjkey 45

4. Vdi jtf gZe h_ bke^hZb_ ^rjftjh\Zgjh kkhgdy dgZdgc
ih\jqgkkb kZh\ZfhZ_hc pdeg`jbqkdc aZjhhdb 46

4.1. AZZb jZhu 47

4.2. Kj`Zb_ b ike^hZ_eg kv \uleggdy aZZdy 47

4.3. K^gdy bn l_jb ijpkZ kf[^gc hZb iekdiZZe_eg fb idZb 48

4.4. Bke^hZb_ ^rjfZb dgZdgc ih\jqgkkb aZjhhdb 53

4.5. <uleggb_ vdi jtf gZ b kjZjhdZ_h j_aulZh 57

4.6. Hfjrh\Zb_ , ijtfhju , bgkjrfgdu , ijbkkf[e_gdy , g[jdhfu_ ^ey \uleggdy
vdi jtf gZ 61

4.7. MZZdy ih kkhZeg x kqlZ 61

4.8. <ijkku ^ey kZdhgjkey 62

Ijhdh`gb_ 64

Bl_jZrjZ 71

I? HBY H;LJ; HDB
F? L. HZ4 >: <E? GB F

HkZb_eb : G_kl_jh\ Gbdhe Zc, B\Zgh\bq
L_ieydh\ <eZ^bfbj <Zkbev_\bq

J^Zdlj = FA\y]bgZ
Ibjj_dlj B FDbj__gdh

Ihfbh\Zgh\ i_qZv 9.03.07. NjfZ [nZb 60 d 84/16. ; nZZ^hdfgdy .
I_qZv ljZZ_gy . Me . i_q . e 4,375. IjZ 100 vdh. AZZa ‹ 221
; ZbkdcZ]hnZ\gc l_gqkdc ngh_jkb_l
Ibihjy ; =M
190005, Hgdl I_j[nj , 1-y Ijhgjf_dy nm ., ^1