8YdUfha Ybh cZ 7cadihYf GW]YbWY

7c``Y[Y cZ 5fhg UbX GW]YbWYg

:UWi`hm

**G. JUb WY`a g** (1--2). DfcZYggcf cZ 7cadihYf GW]YbWY, 7\U]f cZ 7cadihYf GW]YbWY. 6.5., ?Uh\c`]Y_YI b]jYfg]hm/h@Yij jYb, 6Y`[]ia /A.5. (9b[`]g\), I b]jYfg]hmcZA]gg]gg]dd]/A.G. (7cadihYf GW]YbWY), I b]jYfg]hmcZA]gg]gg]dd]/D\.8. (7cadihYf GW]YbWY), A]gg]gg]dd] GHUHY I b]jYfg]hm

SHYd\Ub YEX Y (1--*). 5ggcW]UhY DfcZYggcf cZ 7cadihYf GW]YbWY. 5.G, A]XXY; Ycf[]U 7c``Y[Y/6.G, KYgh; Ycf[]U 7c``Y[Y/A.G., ; Ycf[]U GHUHY I b]jYfg]hm/A.8]j., Gci h\Yfb 6Udh]ghH\Yc`c[]WU` GYa]bUfm

JUa Yg K[f_ (2001). 5ggcW]UhY DfcZYggcf cZ 7cadihYf GW]YbWY. 6.A ., I b]cb I b]jYfg]hm/ A.A . UbX A .5., =bX]UbUI b]jYfg]hm/D\.8., I b]jYfg]hmcZ@ci]g]`` Y.

HUZ;]L] (200(). 5gg]ghUbhDfcZYggcf cZ 7cadihYf GW]YbWY. 6.9., L]'Ub>]Uchcb[I b]jYfg]hm/ A.G. UbX D\.8., I b]jYfg]hmcZ: `cf]XU

GhiXYbh 5kUfXg

5 **DYdUfha YbhU` Ak UfXg** ]g []jYb hc h\Y gYb]cf k\c p`UWygÚfgh]b h\Y A U'cf:]Y`XHYgh Zcf 7cadihYf GW]YbWY Ug dUfh]Ui fÚ`Û`a YbhcZ(-,.

F]fghMYf Pfc[fUa]b[Ak UfX]g Uk UfXYX hc U Zcma di hf gW]YbWY ghiXYbhvzH\Y 8YdUfha YbhcZ7cadihYf GW]YbWY. 5 ghiXYbh]ggY`YWhYX Zcf Yl WY``YbWY UbX]bdUfh]g]b Úfghmf Uf dfc[fUa]b[WcifgYg

7 iff]Wi`ia

H\Y XYdUfha YbhcZZfgZci f d`UggcZghiXm 7ca di hf GW]YbWY a U'cf, 8][]HU A YX]U

GW]YbWY Uhh\Y [fUXi Uhy`YjY`, cf YbhYr h\Y`'cVm a Uf_Yh.

H\Y 8][]HU A YX]U Ghi XYbhg a U'cf`g Ub ]bhYrX]gW]p`]bUfymprogram `c]b]b[ 5fh, 7ca - a ini b]WUh]cb 5fhg UbX 7cadihYf GW]YbWY. =hgdi fdcgY]ghcdfcviXY UghiXYbhUhgY YhWc`y h\Ycfih1`Wc`y]bUhhYbhbc c`]WU`]hmhtUbXUbXUddUcYcZYl WY`]YbWY]bhYfYUhi`Y fYh\ fÀnn =b ghfUhY[]YgUbXh\Ycfymthtr UljYm YXUXYg][b,m YXUdfc[fUa]b[,dX][]hU dfYgYbhUh]cb hYWcb]quYg Ubd hYWocbc`c[WUXjUbWg]b[]hU Wa a i b]WUh]cbg

H\Y7ca di hf GW]YbWY A Ucf]g]bhYbXYX Zcf ghiXYbhg]bhYrghYXdf]a Uf]`mbci fg]b[ UWUfYYr ]b Wca di hf gW]YbWY cf rY`UhYX ÚY`X]a a YXUhYmidcb [fUXi Uh]cb.

H\Y 7ca di hf =bZcfa Uh]cb GmghYa a G A]cfw]`` dfcv]XYh\Y ghiXYbhk]h U [YbYfU i bXYrghUbX]b[cZUbU`mgg XYg][ b, UbX ]a d`Ya YbhUh]cb cZUdd`]WUh]cbgj ]Uh]fÀ- UbX Zci fh\-[YbYrUh]cb dfc[fUa ]b[ `Ub[i U[Ygg UbX dfY-k r]hhYb dUWUU[Yg. H\]ga Ucf]bhYbX

6. GYYWicbb Y. 7G7 33), 3*0, 3-), (11, (*), (,).
7. DfYfYci]g]hYg M 5 H20), 211-2, 31).

II. D][]HU MYX]USHi X]YgMU'cf

5. 7cfYfYei]fYa Ybhg Zcf U`Ya d\UgYg´ 3- \ci fg
1. 5FH120, 221, 231, 3().
2. 7CA 220, 320, 3*), (1-.
3. 7G7 11), 321, 3*0, 3*).
(. 8][]HU A YX]UGHi X]Yg CYa]bUf(-0.

6. 7ca di Hf GW]YbW 9a d\Ug]gfYei]fYa Ybhg´ 23 \ci fg
1. 7G7 12), 220, 23), 2)), 33), (-,.
2. GY YWhk c WifgYg 7G7 3-), (11, (2), (()).
3. DfYfYei]g]hY A 5H20).

7. 5fh9a d\Ug]g´ (2, \ci fg) UbX 7ca a i b]WUh]cb 5 fhg 9a d\Ug]g (2(\ci fg)
GYYh\YfYgdYWUj YXYdUha YbhZcf XYHU]`g

III. M]bcf]b Cca di Hf SW]YbW´ 21 \ci fg

5. FYei]fYX 7G7 11), 12), 220, 23), 2*0, 311.
6. CbYUXX]h]cbU i ddYf`Yj Y 7G7 WcifgYch\Yf h\Ub (-0cf (-,.
7. DfYfYei]g]hY A 5H20).

IV. M]bcf]b Cca di Hf Ibh Zcfa Uh]cb Smgh Ya g´ 21 \ci fg

5. FYei]fYX 7G7 11), 12), 23).
6. GY YWhi(. 7G7 321, 3*0, 3*), 3-), (11.

5ggYgg a Ybh'cZ'AU^cfg

5``gYb]cfWa di Hf gW]YbWa U'cfgai g h hU_Yh\ YA U'cf:]YXHYgh]b Wa di Hf gW]YbW UgcbYfYei]fYa Ybh Zcf 7G7 (-, (gYYVYcw).

GhiXYbh'Cf[Unh]cbg

H\YACW (AggcWUh]cb Zcf Cca di h]b[MUW]bYfm) Shi XYbhC\UdHYf]g Wa dcgYX cZghi XYbhgk \c UfY]bhYfYghYX]b hcXUmg k cf'XcZWa di h]b[. H\YWV VdfcachYgUb]bWUhUgYf_bck `YX[YcZh\YgWa dbWY XYg][b, XYj Ycda Ybh, Wbgfi WWcn, `Ub[i U[YgUbX Udd`]WUh]cbgcZa cXYfb Wa di h]b[ a UW]bYfm=hdfcj]XYgUa YUbgcZWa a ]b]WUh]cb VYhk YYb dYfgcb]bhYfYghYX]b Wa di h]b[ a UW]bYfmUbX h\YYf Udd`]WUh]cbg

7ci fgY'CZZYf]b[g']b'7ca di hYf'GW]YbWY'fl7G7^'

() < ci fg7fYX]h

105. Si fj YmcZM]WcWa di h]b[Add`]WUh]cbg(3)

5b]bhfcXi W]cb, Zcf h\Yb cba U'cf/a]bcf, hc Wa di hfgUbXh\Y f Udd`]WUh]cbg =bWXYg Wa di hf UbX]bZcfa Uh]cb `]hfUWn Vi hh\Ma U]b Ma d\Ug]g]gcb Wa dYhbWnhk th gcZh k UfYh\fci [\ \]bXgcn dfUWWW. 7UbbchVYYUbYX Zcf WAYX]hUf\f 11).*

115. Cca di hf SW]YbWY&Ibhfcdi WW]cb & 0j Yfj]Yk (3)

=bhfcXi WW]cb Hd dcg]b[m a U'cfg/a]bcfg]n th YYfUUdX\ UbX]bhffUUh]cng\]dgcZWifgYg]b h\YUÝYXUbX Ma dck Yf]b[ ]ch\Yfg Zcf U WcbhUbci i g Yd`o`cUf]cn cZhcXUmghY Wbb]VWc gcWYhm 5 `Ub[iU[Y-]bXYdYbXYbhcj Yfj ]Yk cZ\UXk UfYUbX gcZk UfYk ]th\Ya d\Ug]g cb dfcV`Ya gc`j]b[ UbX U`[cf]th\ a XYyYcda YbhX 7UbbchVYYUbYX Zcf WAYX]hUf\f 10) k]th\ci hYXdUha YbhUU ddfcj U.*

*9]th\Yf 10) cf 11) Udd`mhc th Y6.G. gdYW]ÚZWWfY, Vi hbchVch\.

125. Cca di hf SW]YbWY I: Pfc[fUa a]b[ ]n JUj U(4)

DfYfYei]g]hY: 7G7 11).
6UgWWbWVdgcZdfcWYa gc`j]b[, U[cf]th\ a XYg][b UbX Ua gmg] UggfffWhffUUnhYg UbX dfc[fUa gfi WfYg; I =XYj Ycda Ybhk]`` VY ]bhfcdi WYXh\fci[\YWacf]YbhYX dfc[ fUa a ]b[ dUUX][ a k]`` VYYa d\Ug]gYX. Shi XYbhgk]`` XYg][b,]a d`Ya Ybh, XYVi [, hYghUbX XcWa Ybhdfc[ fUa gZcfj Uf]ci gUdd`]WUh]cbg

205. Cca di hYf SWYbWYII: A`[cf]h\ a g & DUIUSHfi WW fYg (3)

DfYfYei]g]hY. 7G7 12) , A 5H20) . DfY-cf 7cfYei]g]hY. A 5H212.

5 ghi XmcZh\YWa d`Yl ]hmcZU[cf]h\ a g UbX UXj UbWXXUIUghfi WW fYg ]bWY X]b[ HfYYg UbX [ fUX\g Hc`g Zcf UbUmn]b[h\YYZUWYbUbUbX XYg]b cZU[cf]h\ a g]bWY X]b[fY-WffYbWY, X]j]XY-UbX-Wcbei Yf, XmbUa]Wdfc[fUa a]b[, UbX [fYYXmU[cf]h\a g

220. Cca di hYf RYdUf UbX MU]bhYbUbWY (3)

DfYfYei]g]hY. 7G7 11) .

5 \UbXg-cb UddfcUW hc Wa dYhYbWY]b WbÚ[ui f]bf]b[,]bghU`]b[ , X]U bcg]b[ , fYdUf]b[ , id[ fUX]b[ UbX a U]bHU]b]b[ a ]WWa di hfg UbX Uggc WUhYX hYWbc`c[]Yg H\Y Wci fgY Wvj YfgVch\ WvfY\UfXk UfY UbXC Ghh`bWc`c[]Yg;

235. Cca di hYf Eh\]Wg (2)

A UcfgcsWU UbX Yh\]WU`]ggi Yg]b Wa di hYfgUbX h\Y=bhYfbYh]bWX]b[ ]a dUWWcZWa a -di hfgcb gcWYWYmUbX h\YWa di hf dfcZgg]cbUÑWWXYcZYh\]Wg

245. FORTRAN (3)

DfYfYei]g]hY. 7G7 11) UbX A 5H211.

=bhfcXi Wgh\YdfcWXi fU dfc [fUa a]b[i g]bf[: CFHF5 B. 9a d`Ugg k ]`VY [ ]j Yb hc gWY[bh]ÛWUdd`]WUh]cbg

255. Pfc[fUa a]b[ ]b C (3)

DfYfYei]g]hYg 7G7 11) .

=bhfcXi Wgh\YdfcWXi fU dfc [fUa a]b[dUfUX][a i g]b[5 B G=7.

260. D][]HU Smgh\a g (3)

DfYfYei]g]hY. 7G7 12) , 7G7 220, UbX A 5H20) .

6]bUfmWYXYg 6cc`YUb U[YffU Wa V]bUh]cbU`]c[]WXYg[b, Û]d-Ûcdg WVi bHYfg gmbWfc-bci ggYei YbhU`c[]WWdfc [fUa a UV`Y`c[]WXYj ]Wg A G=c`][]WYj]Wg UXXYf VUfUY]hg

311. Cca di hYf AfW\]hWWi fY (3)

DfYfYei]g]hY. 7G7 2*0.

=bhfcXi Wcb hc h\YUfW\]hWWi fYcZghcfYYX-dfc[fUa X][]HU Wa di hfg mgh\a g]bWWX-]b[dfcWggcf UbX Yl hYfbU XYj]Wghf WW fYg UbX cdYfUh]cb, a UW]byYdYcdYfUh]cbg UbX]bghfi Wcbg UbX UggYa V`m`Ub[i U[YWbWcthg UbX dfc[fUa a]b[.

321. DUUaUYgYMUbU Ya YbhSmgh\a g (3)

DfYfYei]g]hYg 7G7 11) UbX ĝ]b]bcf ghUbX]b.

< UbXg-cb UddfcUW hc th YXYg[b]bcZXUUaUYgYg WbbcWh]a UXYg[b i g]b[9-F a cXY`UbX `c[]WU XYg[b i g]b[h\Y fYfU]cbU a cXY`UbX XUUaUYgYdfc[fUa a ]b[ i g]b[ GE@. H\Y UfW]hWWfYcZXUUaUYgYUdd`]WUh]cb g]XYgWggYX]bWWX]b[h\Y3-H]YfXm cXY`UbXk YV UUWggg Ei Yf]Yg Zcfm g fYdcfhgUbX Udd`]WUh]cb k]`` VY ghi X]YX Vm a d`Ya Ybh]b[h\Ya]b UW]YbhgYfj Yf Ybj fcba Ybh

335. Cca di hYf GfUd\]Wg (3)

DfYfYei]g]hYg 7G7 2)) /FYWa a YbXYXdfYfYei]g]hY. A 5H31) .

5 b]bj Yg][Uh]cb cZUk]XYfUb[YcZWa di hYf [fUd\]Wg]Udfc[fUa a]b[`Yj Yb bei Yg Hcd]Wg [ fUd\]WXgg]`Umh\Ycfm, [fUd\]WYbWbei Yg Udd]`Wh]cbg UbX \UfXk UfY.

360. WYb Ui]`X]b[& S]hYMUbU Ya Ybh (3)

DfYfYei]g]hY. 7G7 11) . DfY-cf 7cfYei]g]hY. 7G7 321/FYWa a YbXYX DfY. 7G7 12) .

: i bXUa YbhUgcZk YVg]hYXYj YcdaYbhUbXa UbU Ya Ybh [fUd\]WWk YV-Vi]`X]b[ hcc`g a ui]h]-`Yj Y g]hYd`Ubb]b[UbX Wcbghi Wcb, Uj][Uh]cb gWYa Yg WYbhg UbX gYfj Yf-g]XY gW]dcth]b[, VUg]WWth]UWWj]hm]bZcfa Uh]cb cf[UbnUh]cb, UbX h\YXYj YfmcZVUg]WWa ui -h]a YX]U WwbhYbh.

365. DUUCcaaib]Wh]cbgUbXNYhkcf_]b[(3)

DfYfYei]g]hY. 7G7 11) UbX>ib]cfghUbX]b[.

=blfcXi W]cb hc \UfkUYUbXgcZkUYW a dcbYhgcZW a di hf XUUW a aib]Wh]cbg UbXbYhkcf_]b[.9a d\Ug]g]gcbdfUW]W, \UbXg-cbgYhi dUbXUXa]b]ghfUh]cbcZU@5B, dYYf-hc-dYYf bYhkcf_]b[, UbXh\YH7D/=Ddfchcc\`. H:d]W]bW XYfci]]b[, g\UfXΫY

180·280·380·480. Shi XmAVfcUXPfc[fUa g(1-4)

5 `` Wi fgYgUbXh Y]f Udd`]Wh]cb a i ghVYXYÚbYXUbXUddfcjYXdf]cf hc lfUj Y.

195·6·7. SdYWjU Shi X]Yg(1-4)
295·6·7. SdYWjU Shi X]Yg(1-4)

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