

F Ub [`]ghY . `VYghY `@AbXYf`ZØf 5VYbhYi YffY]gYb

8]Y`VYghYb`@AbXYf`ZØf`5VYbhYi YffY]gYb`k i fXYb`j cb`Y]bYf
9l dYfhYb`↑ fm`VYk YfhYh`K]f`ØVYfdfØZYb`X]Y`9f[YVb]ggY
i bhYb`8]Y`5Xj Ybhi fY`HfUj Y`HfUXY`5ggcW]Uh]cb`fBHH5Ł`\\Uh
=g`UbX`ni a`Xf]hhYb`A U`]b`: c`[Y`ni a`VYghYb`@UbX`ZØf
5VYbhYi YffY]gYb`[Y_Øfh`8Yf`_`Y]bY`bcfX]gWXY`ϕgY`ghUUhž
VYfØ`a h`ZØf`gY]bY`; Ymg]fYž`J i`_`UbYž`[Ych`Yfa]gWXYb
@U[i bYb`i bX`Z]`a]gWXYb`@UbXgW UZhYbž`V`Y]Vh`Y]b
UhhfU`_h]j Yg`N]Y`ZØf`5VYbhYi Yf`i gh][Yž`]bgVYgcbXYfY`ZØf
X]Y`Yb][Ybž`XYbYb`B UW\`U`h][_Y]h`Ua` < YfnYb`Y[h`8]Y
GWk Y]n`a]h`\\fYf`Ub[Yb`; YgW]W`hY`XYg`U`d]bYb`Hci f]ga i g
VY`Y[hY`XYb`nk Y]hYb`D`Uhnž`k A`fYbX`BYi gYY`UbXž`Y]bYg`XYf
k Y`hk Y]h`VYghYb`K UbXYf`AbXYf`ni a`K UbXYfbž`XYb`Xf]hhYb
D`Uhn`VY`Y[hY`8Yi hgW`UbXž`? UbUXU`i bX`5i ghfU`Y]b
gW`b]hhYb`YVYbgc`[i h`UV`k]Y`X]Y`UbXYfYb`bcfX]gWXYb
/ Ua d^Y`d/

8]Y`VYghYb`@AbXYf`ZØf`5VYbhYi YffY]gYb`k i fXYb`j cb`Y]bYf
9l dYfhYb`↑ fm`VYk YfhYh`K]f`ØVYfdfØZYb`X]Y`9f[YVb]ggY`i bhYb

8]Y`5Xj Ybhi fY`HfUj Y`HfUXY`5ggcW]Uh]cb`fBHH5Ł`\\Uh`=g`UbX`ni a
Xf]hhYb`A U`]b`: c`[Y`ni a`VYghYb`@UbX`ZØf`5VYbhYi YffY]gYb
[Y_Øfh`8Yf`_`Y]bY`bcfX]gWXY`ϕgY`ghUUhž`VYfØ`a h`ZØf`gY]bY
; Ymg]fYž`J i`_`UbYž`[Ych`Yfa]gWXYb`@U[i bYb`i bX`Z]`a]gWXYb
@UbXgW UZhYbž`V`Y]Vh`Y]b`UhhfU`_h]j Yg`N]Y`ZØf`5VYbhYi Yf`i gh][Yž`
]bgVYgcbXYfY`ZØf`X]Y`Yb][Ybž`XYbYb`B UW\`U`h][_Y]h`Ua` < YfnYb
`Y[h`

8]Y`GWk Y]n`a]h`\\fYf`Ub[Yb`; YgW]W`hY`XYg`U`d]bYb`Hci f]ga i g
VY`Y[hY`XYb`nk Y]hYb`D`Uhnž`k A`fYbX`BYi gYY`UbXž`Y]bYg`XYf
k Y`hk Y]h`VYghYb`K UbXYf`AbXYf`ni a`K UbXYfbž`XYb`Xf]hhYb`D`Uhn

VY`Y[hY" `8 Yi hgW`UbXž? UbUXU`i bX`5i ghfU`Yb`gW`b]hhYb`YVYbgc
[i h`UV`k]Y`X]Y`UbXYfYb`bcfX]gW`Yb`@AbXYf"

8]Y`5HH5`k i fXY`%- - \$`[Y[f0bXYhi bX`]gh`XUg`[f0» hY`[`cVU`Y
BYmk Yf`_Z0\fybXYf`5VYbhYi YffY]gYbXYf"A]h<]`ZY`gY]bYf
' "\$\$\$\$!_0dZ][Yb`; Ya Y]bgW`UZhj cb`A YbgW`Ybž`X]Y`ja
5VYbhYi Yfci f]ga i g`h`h][`g]bXž`YfghY`h`X]Y`5HH5`XYb`5Xj Ybhi fY
Hci f]ga `8Yj Y`cda Ybhi`bXYI`f5H8`ž`Y]b`[`cVU`Yg`F`Ub_]b[`j cb
5VYbhYi YffY]gYb`fi bX`i a`XYb`; `cVi`g"

C`j] Yf`; 0fghbYf#G\i hhYfghcW`_Hci f]ghYbž`X]Y`Y]bYb`?`YhhYfghY][`]b
XYf`GW`k Y]n`UVgc`j]YfYb

8Yf`5H8`=bi mnh`Y]b`; fYa]i a`Ui`g`' *`\$`6fUbW`YbYI dYfhYb`gck]Y
8UhYb`k]Y`XUg`6fi hhc]b`UbXgdfcXi`_h`f6`Dž`X]Y
6Yj 0`_Yfi b[gX]W`hYž`GW`i hm[YV]YhYž`XYb`9bj]fcba YbhU`
DYfZcfa UbW`bXYI ž`XUg`K cf`X`FYgci fW`g`bgh]hi hY`i bX
FY]gY\]bk Y]gY`XYg`; cfY][b`/`7ca`a`cbk YU`h`C`ZZ]W"

9I dYfhYb`a 0ggYb`0VYf`a Y`f`U`g`Z0bZ`ž\fy`9fZU\fi b[`]b`XYf
5VYbhYi YffY]gYVfUbW`Y`j YfZ0[Ybž`i a`Z0f`XUg`; fYa]i a
VYf0W`_g]W`h][hini`k YfXYb" `a`8i fW`gW`b]hh`\UVYb`X]Y
5i g[Yk`À`\hYb`%)`ž\fy`9fZU\fi b[`]a`Hci f]ga i g`i bX`%&`ž\fy
9fZU\fi b[`]a`6YfY]W`5VYbhYi YffY]gYb"

8Yf`5H8`=VYk YfhYh`@AbXYf`]b`%\$`?`UhY[cf]Ybž`X]Y`]b`XfY]`GÀi`Yb
ZU`Yb.

G=7 < 9F < 9H / `K`@@?`C`A`A`9B

- Dc`]h]_`XYf`bUW`\U`h][Yb`9bhk]W`_i b[
- G]W`Yf\Y]h
- 8]Y`; Ygi bX\Y]h
- BUh0f`]W`Y`F`Yggci fW`b

569BH9I`9F

- FYggci fW`b`Z0f`5VYbhYi YfU`_hj]]h`hYb

- I bhYfbY\ a YfgWUZh

69F 9#HG7 < 5: H

- < i a Ub]hÅf
- Hci f]ga i g]bZfUghfi _hi f
- ?i `hi fY`Y`F Yggci fWb
- 6]`X

8]Y `%\$ `VYghYb `@ÀbXYf`ZØf`5VYbhYi YffY]gYb

⇒g`UbX
 GWk Y]n
 BYi gYY`UbX
 8Yi hgW`UbX
 Bcfk Y[Yb
 :]bb`UbX
 GWk YXYb
 ?UbUXU
 8ÅbYa Uf_
 5i ghfU`Yb

K]W h][Y `9f_Yb b hb]ggY

8U`X]Y`K Y`h`a]h`VY]gd]Y``cgYb`<YfUi gZcfXYfi b[Yb`]b`: cfa `XYg
 ?`]a Uk UbXY`g`i bX`Y]bYf`[`cVU`Yb`DUbXYa]Y`_cbZfcbh]Yfh`]ghž
 i bhYfghfY]W`h`XYf`6Yf]W`h`Ui W`X]Y`B`c`h`k`Y`b`X][`_Y]h`ZØf`X]Y`k`Y`h`k`Y]h
 ZØ\ fYbXYb`5VYbhYi YffY]gYn]Y`Yž`bUW\`U`h][`Yf`k`]YXYf`Ui`Zni`VUi`Yb"

⇒g`UbXž`XUg`X]Y`F`Ub[`]ghY`XYf`VYghYb`@ÀbXYf`ZØf`5VYbhYi YffY]gYb
 UbZØ\ fhž`gW`bY]XYh`VYgcbXYfg`[i`h`]b`XYf`?`UhY[`cf]Y`5Xj`Ybhi`fY
 5W]j`]hm`F`Y`gci`fW`g`UV"8]Y`GWk`Y]n`VY`Y[`hY`Ui`Z`XYa`nk`Y]hYb
 ;`YgUa`hfUb[`XYb`\`ØW`ghYb`D`Um`]b`XYf`?`UhY[`cf]Y`B`UW\`U`h][`Y
 9bhk`]W`_i`b[`i`bX`gW`b]h`]b`XYb`a`Y]ghYb`UbXYfYb`?`UhY[`cf]Yb
 _cbghUbh`[i`h`UV"

⇒a`5``[`Ya`Y]bYb`Yf\`Ø\`Yb`@ÀbXYf`Ui`Z`XYf`[`Ubnyb`K`Y`h`X]Y`5bnU\`
 [`YgW`Ø`hnhYf`A`YYfYg!`i`bX`@`UbX[`YV]YhYž`X]Y`k`]YXYfi`a`X]Y

@YVYbgrfAi a Y j]Y`Yf[YZ\`fXYhYf`5fhYb`gW\ØhYb"

Δ_i V`6UfnmW_]#G\i hYfghcW_`ϕgY`ghUUhYb`dUggYb`g]W\`gW`bY`Yf
Ub`XYb`?`]a Uk UbXY`Ub

ϕ`XYb`?`UhY[cf]Yb`XYf`Dc`h]_`ZØf`bUW\`U`h][Y`9bhk]W_`i b[
gW`b]hYb`X]Y`ϕgY`ghUUhYb`]b`XYf`FY[Y`[i`h`UV``6UfVUXcg`i bX`X]Y
GYmW`Y`Yb`g]bX`ZØ\`fYbX`VY]`XYf`I a`gYhni b[`j`cb`A`U»`bU\`a`Yb`ni`f
9]bX`Åa`a`i`b[`i`bX`5bdUggi b[`Ub`XYb`?`]a Uk UbXY`i`bX`\`UVYb
XU\`Yf`d`cg]h]`Y`9f[YVb]ggY`VY]`\`fYb`9f[YVb]ggYb`]a
I a`k`Y`hY]ghi b[g]bXYI`Yfn]Y`h"

ϕg[YgUa`h`g]bX`X]Y`Ua`gW\`YW`hYghYb`UVgW`bY]XYbXYb`@AbXYf
hYbXYbn]Y`9bhk]W_`i b[g`AbXYf`i`bX`VYZ]bXYb`g]W\`c`Z]b`Y]bYf
Dcgh!`?`cbZ]_`h`c`XYf`?`cbZ]_`hg]hi`Uh]cbž`k`]Y`Gi`XUb`i`bX`Gca`U`]U"
K`Å\`fYbX`XYf`Hci`f]ga`i`g`ZØf`X]YgY`@AbXYf`_Y]bY`Df]cf]h`h`\`Uhž]gh
Yg`Yfk`Å\`bYbgk`Yfhž`XUgg`j`]Y`Y`VY]YVhY`5VYbhYi`Yfhci`f]ga`i`gn]Y`Yž
k`]Y`Fi`UbXUž`?`fcUh]Yb`i`bX`G`ck`Yb]Ybž`fY`Uh]j`bYi`Y`6Øf[Yf`_f]Y[Y
\`UhYb`i`bX`XYb`5VYbhYi`Yfhci`f]ga`i`g`U`g`A`]hY`ZØf`X]Y
k`]fhgW`UZh]W`Y`9bhk]W_`i b[ž`X]Y`GW`UZZi`b[`j`cb`5fVY]hgd`ÅhYb
i`bX`XYb`K`]YXYfUi`ZVUi`bi`hnhYb`Dcgh!`?`cbZ]_`h"

8]Y`7cfcUj`]fi`g!DUbXYa`]Y`nY][`h`X]Y`Xf]b[YbXY`B`chk`YbX][`_Y]h
Y]bYg`bUW\`U`h][`Yb`:`Ø\`fi`b[gUbgUhnYg`i`Y]bYgž`XYf`g]W\`Ui`Z
FYg`]Ybnž`9]bZU`g`fY]W`hi`a`i`bX`9ZZ]n]Ybn`_`cbnYbhf]Yfh"

ϕXYI`ZØf`X]Y`9bhk]W_`i b[`XYg`5VYbhYi`Yfhci`f]ga`i`g

8 Ug`J`YfY]b][`hY`?`Øb][`fY]W\`fi`hgW`hY`Ui`g`XYb`Hcd`%\$`Ui`Z[`fi`bX
Y]bYf`gW`k`UW`Yb`Di`b`_hmU\`Y]b`XYb`?`UhY[`cf]Yb`B`Uhi`fU`
FYgci`fW`g`i`bX`5Xj`Ybhi`fY`5W]j`]hm`FYgci`fW`g`"8 Ug`@UbX
k`i`fXY`_Øfn`]W\`ni`Y]bYa`XYf`j`cb`XYf`B`Uhi`f`Ua`gh`Åf`ghYb
[`YgW`ÅX][`hYb`@AbXYf`XYf`K`Y`h`Yfb`Ubbhž`]b`XYa`i`YXY`g]YVhY
Y]b`Y]a`]gW`Y`5fh`j`ca`5i`gghYfVYb`VYXfc`\`h]ghi`bX`a`Y`\`f`U`g`(\$`i
j`ca`FØW_[`Ub[`VYXfc`\`hg]bX"

8]Y`I`G5`Z]Y`b`Ui`Z[`fi`bX`b]YXf][`YfYf`Di`b`_hmU\`Yb`]b`XYb
?`UhY[`cf]Yb`B`Uhi`fU`FYgci`fW`g`i`bX`7i`hi`fU`FYgci`fW`g`i`a

XfY]`D`ÀhnY`ni fØW_"`8]Yg`]gh`k U\fgWXY]b`]W`XUfUi Z
 ni fØW_ni ZØ\fybžXUgg`GW`i hn[YV]YhY`k À\fybX`XYf`Hfi a d!
 5Xa]b]ghfUh]cb`_Øfn`]W`YfUV[Yghi Zh`cXYf`j Yf`_Y]bYfh`k i fXYb
 fčV`k c\`Y]b][Y`VY[]bbYbž`k]YXYf\Yf[YghY``h`ni`k YfXYbŁ"8 UfØVYf
 \]bUi g`V`Y]Vh`XYf`9j Yf[`UXYg!B Uh]cbU`dUf`_]b`XYb`i G5`Ui Z`XYf
 @]ghY`XYg`[YZÀ\`fXYhYb`K`Y`hYfVYg"

? ca d`YhhY`F Ub[`]ghY

8 Ug`F Ub_]b[`XYf`VYghYb`@ÀbXYf`ZØf`5VYbhYi YffY]gYb`VUg]Yfh`Ui Z
 XYa`5H8`žXUg`j cb`XYf`5HH5`]b`Ni gUa`a YbUfVY]h`a]h`XYa
 ðhYfbUh]cbU`ðgh]hi hY`cZHci f]ga`Ghi X]Yg`XYf`; Ycf[Y
 K Ug\]b[hc b`i`b]j Yfg]hmYfghY``h`k i fXY"

8 Yf`ðXYI`YfZUggh`_Y]bY`6Ygi W`YfnU\`Yb`i bX`]gh`_Y]b`F Ub_]b[`ZØf
 XUg`Hci f]ghYbUi Z_ca`a Yb"

F Ub[	@UbX	Di b_hnU\`
%	=g`UbX	%%\$
&	GW`k Y]n	%%
'	B Yi gYY`UbX	%-
(	8 Yi hgW`UbX	&(
)	B cfk Y[Yb	&(
*	:]bb`UbX	&-
+	GW`k YXYb	' %
,	? UbUXU	')
-	8 ÀbYa Uf_	' *
%%\$	5i ghfU`]Yb	' +
%%	² ghY ffY]W	' +
%&	A cbUWŁ	' +
%'	J YfY]b][hYg ? Òb][fY]W	' ,
%(ZØb ZnY\ b	ƒ`UbX HgW`YW]gW`Y F Ydi V`]_	' -
%*	: fUb_fY]W	(\$
%+	B]YXYf`UbXY	(&
%,	↵dUb	((

%-	7\]Y	((
&\$	@ | Ya Vi f[(+
&%	G`ck U_Y]) \$
&&	G`ck Yb]Yb) \$
&'	GdUb]Yb) (
&(	=gfUY`) (
&)	A U`hU) *
&*	9gh`UbX) +
&+	6Y`[]Yb) -
&,	#U`]Yb) -
&-	J YfY]b][hY`GhUUhYb j cb`5a Yf]_U) -
' \$	Dc`Yb	* \$
' %	6i `[Uf]Yb	* \$
' &	Dc fhi [U`	* '
' '	Fi a Åb]Yb	*)
' (	NmdYfb	* -
')	; f]YWX Yb`UbX	+\$
' *	@]YWX hYbghY]b	+%
' +	5bXc ffU	+,
' ,	7cghU`F]WU	, (
' -	? fcUh]Yb	, (
( \$	? cfYUž`F Yd	, +
(%	8ca]b]_U	- \$
(&	6\i hUb	- %
('	l b[Ufb	- '
((	@Yhh`UbX	- *
()	l fi [i Um	- *
(*	; Ycf[]U	%%\$%
(+	A cbhYbY[fc	%%\$*
(,	æfXUb]Yb	%%'
(-	6UfVUXcg	%%)
) \$	J 59	%%*
) %	Hfi h\U\b	%%&%
) &	@]hUi Yb	%%&&
) '	6chgk UbU	%%& ,
) (	GYfV]Yb	%%&-
))	5`VUb]Yb	%()

) *	A Ufc__c	%()
) +	DYfi	%(*
) ,	GYmWXY`Yb	%(*
) -	DUbUa U	%) \$
* \$	A cb[c`Y]	%) '
* %	? UhUf	%) (
* &	G]b[Udi f	%))
* '	H\U]`UbX	%))
* (	5fa Yb]Yb	%) *
*)	:]XgW]	%) -
**	5f[Ybh]b]Yb)* &
* +	?]f[]ghUb)* '
* ,	5gYfVU]XgW Ub)* '
* -	? i k U]h)* (
+\$	6U\Ua Ug)* +
+%	A]_fcbYg]Yb)+ %
+&	DU`Ui)+ %
+'	F i gg`UbX)+ &
+(	6Y`]nY)+ *
+))	D\]`]dd]bYb)+ +
+*	A Ui f]h]i g)+ +
++	6U\ fY]b)+ ,
+,	A YI]_c	%, \$
+ -	I _fU]bY	%, \$
, \$	Gh" J]bW`bh/ ; fYb	%, \$
, %	? UgUW`ghUb	%, %
, &	6fUg]`Yb	%, &
, '	F i UbXU	%, ,
, (	C a Ub	%, ,
,)	B cfXa UnYXcb]Yb	%- \$
, *	K Y]» fi gg`UbX	%- *
, +	6fi bY]`8 Ufi ggU`Ua	%- +
, ,	? Ud `J YfXY	&\$ \$
, -	GUi X]!5fUV]Yb	&\$ (
- \$	8ca]b]_Ub]gWXY`FYd	&\$ (
- %	? c`i a V]Yb	&\$ +
- &	Gh" `@ W]U	&\$ +
- '	7\]bU	&\$,

- (	B Ua]V]U	&%\$
-)	B YdU`	&%&
- *	G Ua V]U	&% (
- +	Hi b Yg]Yb	&%)
- ,	G Ua c U	&%)
- -	@Ucg	&%+
%%\$	J]YhbUa	&%&
%%\$%	A c`XUk]Yb	&& (
%%\$&	G YbY[U`	&&,
%%\$'	9`GU`j UXcf	&&-
%%\$ (	GØXUZf]_U	&' \$
%%\$)	GUb`A Uf]bc	&' \$
%%\$*	l gVY_]ghUb	&' %
%%\$ +	; i UhYa U`U	&' '
%%\$,	Gh" ?]hng`i bX`BYj]g	&' (
%%\$ -	? i VU	&' +
%%%\$	A U`YX]j Yb	& (\$
%%%%	HUXgWk_]ghUb	& ((
%%%&	Hf]b]XUX / `HcVU[c	& ()
%%%'	J Ubi Uhi	& (,
%%%(	ÿ [mdhYb	&) \$
%%%)	↵Ja U]_U	&) \$
%%%*	5`[Yf]Yb	&) \$
%%%+	; \UbU	&) %
%%%,	9W UXcf	&) %
%%%-	≠Ub	&) (
%%&\$	6cgb]Yb / `< Yfn	&) +
%%&%	A Ufg\U``]bgY`b	&) ,
%%&&	; i mUbU	&* \$
%%&'	B]WUfU[i U	&* %
%%&(	≠X]Yb	&* '
%%&)	Gf]`@Jb_U	&* '
%%&*	A U`Umg]U	&* *
%%&+	@]VUbc b	&* ,
%%&,	?]f]VUh]	&* ,
%%&-	≠XcbYg]Yb	&+ \$
%%' \$	; UVi b	&+ &
%%' %	? Yb]U	&+ (

%' &	Gi f]bUa	&+)
%' '	5bh][i U'i bX 6UfVi XU	&+*
%' (	; fYbUXU	&+*
%')	HUbgUb]U	&+-
%' *	? Ua VcXgWU	&- &
%' +	GU`ca cb! bgy`b	&-)
%' ,	6c`j]]Yb	&- ,
%' -	DU_]ghUb	' \$&
%(\$	GUc`Hca Y / `Df]b	' \$'
%(%	Yh\]cd]Yb	' \$(
%(&	A U`Uk]	' \$*
%('	J YbYni Y`U	' \$+
%( (	DUdi U`BYi !; i]bYU	' %&
%()	Gk Ug]`UbX	' %)
%(*	DUfU[i Um	' &\$
%(+	I [UbXU	' &&
%(,	9`ZYbVY]b_ØghY	' &'
%(-	? ca cfYb	' &)
%) \$	6Ub[`UXYgWU	' &+
%) %	Hi f_a Yb]ghUb	' &,'
%) &	N]a VUVk Y	' ' '
%) '	; Ua V]U	' ' (
%) (	6i fi bX]	' ')
%))	@Ygch\c	' (%
%) *	Hcb[U	') \$
%) +	6i f_]bU': Ugc	') &
%) ,	? Ua Yfi b	') '
%) -	6i fa U	') '
%* \$	6Yb]b	') (
%* %	A U`]	') (
%* &	< cbXi fUg	') +
%* '	H]a cf!@YghY	' * &
%* (	Y a Yb	' +-
%*)	A UXU[Ug_Uf	' , \$
%* *	Y ei Uhcf]U`[i]bYU	' , \$
%* +	; i]bYU	' , \$
%* ,	A Ui fYhUb]Yb	' , &

%* -	; i]bYU!6]ggUi	' , -
%+ \$	Gi XU b	' - %
%+ %	A cgUa V]_	' -)
%+ &	5Z[\Ub]ghUb	' - +
%+ '	B][Yf	' - ,
%+ (	; Y\Yb	(\$)
%+)	DU`Àgh]bYbg]gWXY ; YV]YhY	(\$)
%+ *	G]YffU`@YcbY	(\$,
%+ +	@]VYf]U	(\$,
%+ ,	9f]hfYU	(%\$
%+ -	BcfX`?cfYU	(%'
%, \$	@]VmYb	(%*
%, %	5fUV]gWXY`FYdi V`]_ Gmf]Yb	(%+
%, &	<U]h]	(%-
%, '	5b[c`U	(&\$
%, (	8F`?cb[c	(&'
%,)	NYbhfU`UZf]_Ub]gWXY FYd	(&(
%, *	B][Yf]U	(' '
%, +	8gW]Vi h]	(' ,
%, ,	HgW UX	((\$
%, -	?cb[c	((,
%- \$	ƒU_	() -
%- %	Gca U`]U	(, +

'U`h1 D]bhYfYgh!D]b`ZØf`X]Y`VYghYb`@ÀbXYf`ZØf`5VYbhYi YffY]gYb 2

@Y]hV]`X.`N\i`_cj U`J U`Yb hmbU#G\i hhYfghcW_

6Ygi W\Yb`G]Y`i bg`Ui Z.`Y]bY!fY]gY"XY