Q-1	a)
	C2H6 + 3.5(02+3.76N2) -> 2CO2+3H2O+13.16
	$\cup \subset I$
	$A/F = 3.5 \times 4.76 \times 29 = 16.1 $ Kg of air
	$A/F = \frac{3.5 \times 4.76 \times 29}{30} = 16.1 \text{ kg of air}$
	b) let LOO kmol of Dry gases.
	0 0
	AC2H6 + B (O2+3.76N2) -> 5.2 co2 + 0.33 co
-	+ 11.24 Oz + 83.23 Nz
	Here, carbon Balancing: + CH20
	2A = 5.2 + 0.33 = 5.53
	$\neq A = 2.765$
	$6A = 2C \neq C = 3A = 8.295$
- F	02 -> Balance:
	$C + 11.24 \times 2 + 0.33 + 5.2 \times 2 = 2B$
	$\frac{1}{2}$ B = 20.7525
	200
	Actual Air fuel Ratio = 20.7525 × 4.76×29
	2.765x30
	= 34.535 kg of Air/kg of fuel.
	% of exam $cir = 34.535 - 16.1 \times 100 = 114.5$
	16.1
	alternatively it can be done by balancing N2 on the both sides o
	chemical reaction

Alternate:

Balancing for N2

$$3.76 \times B = 83.23$$

$$= 22.1$$

$$A/f = \frac{22.1 \times 4.76 \times 29}{2.765 \times 30} = 36.7 \text{ kg of Air/kg of full.}$$

% exem air =
$$\frac{36.7 - 16.1}{16.1} \times 100 = 128\%$$

9-27					
9 47				7a 1 1 - 0	W
	C3 H8 +	15 (O2+3.	76 N2)>	3CO2 + 4H2O	3
				+ 100z	1
2 14 22 4 1 3	. 1 . 1	- 		+ 56.4 NZ	1
	enthalpy c	of product = e	uthalpy of R	Reactant	Ť
		73 87		A	4
	Here 1	(hf.) + 0	= -103	850	9
1		318		gradian d	-
	Reactar	ut'h' = -103	,850 KJ		4
	0.91.5		to often	3. 33.	4
	Assyming by	product as y	12)1→		
	U		- a v z,		
	R/1/=	73/4 (h-)-	\$ 676 \$ 1 /=1/	a l	
				4 6	
0 2 2 2 2	compound	hf	ho		
	C3H8 (g)	-103850	, , , , , , , , , , , , , , , , , , ,	7 -	
	CO2	-393520	9364		
	H20	-241820	9904	Sec 1	
	02	0	8682		
3	N ₂	0	8669		
* P. M. 5	3 (-3935)	$20 + h_{col} - 936$	4) + 4 (-2	141820 + hH20-990	34)
	+ 10 (hoz - 8682)	+ 56.4 (H	141820 + hH20-990	(
7	= -103850				

$3h_{co2} + 4h_{H_{2}o} + 10h_{o2} + 56.4 h_{N_{2}} = 2687449.6$ $= 2687449.6 = 36613.75$ 75.4 $T_{N_{2}} \cong 1145 \text{ K}$ $181 \text{ guess } T = 1150 \text{ K}$ $+ 3x51602$ $= 2693856 > 2687449$ $Second \text{ guess}$ $T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3x50484$ $= 2642176 < 2687449$ 50 $\text{Enterpolating } 6/40 \text{ T} = 1140 \text{ B T} = 1160$ $T_{Gio} = 1157 \text{ K}$	
$= 2687449.6$ $= 2687449.6 = 36613.75$ 73.4 $T_{N_2} \cong 1195 \text{ K}$ $H_{RHS} = 56.4 \times 35430 + 10 \times 37023 + 4 \times 42642$ $+ 3 \times 51602$ $= 2693856 > 2687449$ Second guss $T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So $\text{Interpolating B/W} T = 1140 \text{ Φ $T = 1160}$	3 hos + 4 hus + 10 hos + 56.4 hrz = 2/B/0/8/2/X/N
$= 2687449.6 = 36613.75$ 73.4 $T_{N_2} \cong 1195 \text{ K}$ $1st \text{ guess } T = 1160 \text{ K}$ $+ 3x51602$ $= 2693856 > 2687449$ $Second \text{ guess}$ $T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So 200 $2012176 < 2687449$ $= 2012176 < 2687449$ $= 2012176 < 2687449$ $= 2012176 < 2687449$ $= 2012176 < 2687449$	
73.4 The flat glass $T = 1160 \text{K}$ Here $T = 1160 \text{K}$ $T = 1160 \text{K}$ Here $T = 1160 \text{K}$ $T = 1160 \text{K}$ $T = 1160 \text{K}$ Second glass $T = 1140 \text{K}$ $T = 1140 \text{K}$ Here $T = 1140 \text{K}$	
73.4 $T_{N_2} \cong 1195 \text{ K}$ 18 guess $T = 1160 \text{ K}$ $H_{RHS} = 56.4 \times 35430 + 10 \times 37023 + 4 \times 42642$ $+ 3 \times 51602$ $= 2693856 > 2687449$ Second guess $T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So Putapolahing B/W $T = 1140 \text{ B } T = 1160$	= 2687449.6 = 36613.75
Second guess T = 1150 K H_{RHS} = 56.4 \times 35430 + 10 \times 37023 + 4 \times 42642 + 3 \times 51602 = 2693856 \to 2687449 Second guess	73.4
Second guess T = 1150 K H_{RHS} = 56.4 \times 35430 + 10 \times 37023 + 4 \times 42642 + 3 \times 51602 = 2693856 \to 2687449 Second guess	T _N ≈ 1195 K
H _{RHS} = $56.4 \times 35430 + 10 \times 37023 + 4 \times 42642$ $+ 3 \times 51602$ = $2693856 > 2687449$ Second guess T = 1140 K H _{RHS} = $56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ = $2642176 < 2687449$ SO Interpolating B/W $T = 1140 $ Φ $T = 1160$	
H _{RHS} = $56.4 \times 35430 + 10 \times 37023 + 4 \times 42642$ $+ 3 \times 51602$ = $2693856 > 2687449$ Second guess T = 1140 K H _{RHS} = $56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ = $2642176 < 2687449$ SO Interpolating B/W $T = 1140 $ Φ $T = 1160$	TSt guess T = 1150 K
$ \begin{array}{r} $	gain the state of the district
$= 2693856 > 2687449$ Second guess $T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So $\text{Interpolating B/W} T = 1140 \text{ B } T = 1160$	HRHS = 56.4x 35430 + 10x 37023 + 4x42642
Second guess $T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So Interpolating B/V $T = 1140 $	+ 3×51602
$T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So $\text{Interpolating B/W T= 1140 } \text$	= 2693856 > 2687449
$T = 1140 \text{ K}$ $H_{RHS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So $\text{Interpolating B/W T= 1140 } \text$	
$H_{RMS} = 56.4 \times 34760 + 10 \times 36314 + 4 \times 41780$ $+ 3 \times 50484$ $= 2642176 < 2687449$ So Interpolating B/W T= 1140 & T= 1160	Second guess
$+3 \times 50484$ $= 2642176 < 2687449$ SO Interpolating B/V T= 1140 & T= 1160	T= 1140 K
$+3 \times 50484$ $= 2642176 < 2687449$ SO Interpolating B/V T= 1140 & T= 1160	H _{RHS} = 56-4×34760 + 10×36314 + 4×41780
= 2642176 < 2687449 50 Interpolating B/W T= 1140 B T= 1160	+ 3 × 50484
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Interpolating B/W T= 1140 & T= 1160	
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	Tan = 1157 K