Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) mol CH_3OH = 0.07(0)

1

mol H_2 = 0.24(0)

1

(b) (i)

$$\frac{[CH_3OH]}{[CO][H_2]^2} \text{ or } \frac{(0.082/1.5)}{(0.210/1.5)(0.275/1.5)^2}$$

allow ( ) but expression using formulae must have brackets alternative expression using numbers must include volumes

1

(ii) **M1** divides by vol

Mark independently from (b)(i)
any AE is –1
if volume missed, can score only M3 and M4

1

M2 $\frac{(0.082/1.5)}{(0.210/1.5)(0.275/1.5)^2} \quad \left(= \frac{(0.05467)}{(0.14)(0.1833)^2}\right)$

mark is for correct insertion of correct numbers in correct Kc expression in b(ii)
If Kc expression wrong, can only score M1 & M4
If numbers rounded, allow M2 but check range for M3

1

M3 11.6 or 11.7

mark for answer
above 11.7 up to 12.2 scores 2 for M1 and M2
if vol missed, can score M3 for 5.16 (allow range 4.88 to 5.21)

1

M4 $mol^{-2}\ dm^6$

Units conseq to their Kc in (b)(ii)

1

(iii) no effect or no change or none

1

(c) **M1** T_1

if wrong - no further marks

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1

M2 (forward) reaction is exothermic **OR** gives out heat

backward reaction is endothermic

only award M3 if M2 is correct

1

M3 shifts to RHS to replace lost heat

OR to increase the temperature

OR to oppose fall in temp

backward reaction takes in heat

OR to lower the temperature

not just to oppose the change

1

(d) fossil fuels used

OR

CO_2 H_2O produced/given off/formed which are greenhouse gases

OR

SO_2 produced/given off/formed which causes acid rain

OR

Carbon produced/given off/formed causes global dimming

not allow electricity is expensive
ignore just global warming
ignore energy or hazard discussion

1

(e) $C_{17}H_{35}COOCH_3$ **or** $C_{17}H_{31}COOCH_3$ or $C_{17}H_{29}COOCH_3$

OR

$CH_3OOCC_{17}H_{35}$ or $CH_3OOCC_{17}H_{31}$ or $CH_3OOCC_{17}H_{29}$

1

[13]

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Q2.

Sample in capillary / melting point tube

Accept alternative as long as small container used

1

Heat in melting point apparatus / heat <u>gently / slowly</u> near melting point

1

[2]

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Q3.

(a) (i) propan(e)-1,2,3-triol or 1,2,3- propan(e)triol

not propyl
ignore hyphen, commas

1

(ii) soaps

allow anionic surfactant
not cationic surfactant
not detergents, not shampoos

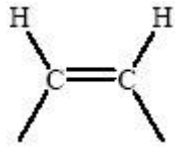
1

(b) (i) (bio)<u>diesel</u>

Allow fuel for <u>diesel</u> engines
not biofuel, not oils

1

(ii)



ignore anything else attached except any more H atoms.

1

(iii) $CH_3(CH_2)_{12}COOCH_3 + 21½O_2 \rightarrow 15CO_2 + 15\ H_2O$

OR

$C_{15}H_{30}O_2$ or 43/2

***not** allow equation doubled*

1

[5]

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