HYDROCARBONS 2

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
(a)(i)	(yes as it) has the lowest / least (%)	ignore no accept it is only 6.6(%) accept any correct comparisons	1
(ii)	(no as it) any one from: • is second lowest • is 'medium' • is (only) third highest • depends on which oil it is compared with	ignore yes ignore it is only 29.3% accept neither high or low accept not the highest accept any correct comparison accept it has more mono – unsaturated fat	1
(b)	(test) add bromine / iodine (solution) (result) turns colourless / decolourises	ignore bromide / iodide ignore colours ignore clear ignore changes colour	1 1
(c)	increase(s) / gets higher	ignore boiling point	1
Total marks			5

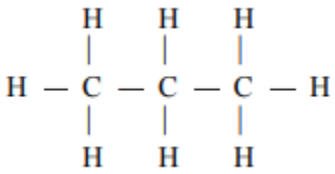
Q2.

Question	Answer	Extra information	Marks
(i)	3 (C_2H_4)	accept + C_4H_8	1
(ii)	(decane / naphtha / hydrocarbon) vaporise / evaporate (passed over) a catalyst / alumina / porous pot	allow crude oil allow boil for vaporise ignore other names of catalysts	1 1
Total marks			3

Q3.

Question	Answer	Extra information	Marks
(i)	burning / combustion	allow oxidation / redox	1
(ii)	any **two** from: • cracking / (thermal) decomposition • heat / vaporise • catalyst / aluminium oxide	reaction with hydrogen gains max of 1 mark only allow porous pot ignore names of other catalysts	2
Total marks			3

Q4.

Question	Answer	Extra information	Marks
(a)	C_4H_{10}		1
(b)			1
(c)(i)	C_5 to C_8 fraction are fuels or easier to burn or petrol (fraction)	accept C_{21} to C_{24} fraction not useful as fuels do not accept produce more energy	1
(ii)	C_2H_4	do not accept C_4H_8	1
(iii)	any **three** from: • use different / lighter crude oils • develop markets for low demand fractions • develop new techniques / equipment to use low demand fractions as fuels • cracking • convert low demand fractions to high demand fractions or bigger molecules to smaller molecules • develop alternative / bio fuels	 do not accept price	3
Total marks			7

Q5.

Question	Answer	Extra information	Marks
(a)(i)	he greater the number (of carbon atoms), the higher its boiling point	do not accept hydrocarbons for carbon atoms allow converse allow melting point	1
(ii)	accept answers in the range 344 to 350		1
(iii)	216		1
(b)(i)	**EITHER** shortage of petrol or demand for petrol is higher than supply diesel is in excess or supply of diesel is higher than demand **OR** petrol low supply and diesel high supply (1) petrol high demand and diesel low demand (1)	petrol / diesel not specified = max 1 mark	1 1
(ii)	any one from: • use diesel to make petrol • make diesel cheap(er) (than petrol) or make petrol more expensive • mix ethanol with petrol	accept crack diesel or description of cracking accept lobby the government to reduce the tax on diesel / increase tax on petrol ignore biodiesel	1
Total marks			6

Q6.

Question	Answer	Extra information	Marks
(i)	23 to 59	accept 36	1
(ii)	any one from: • an anomalous result (11.2) / Test 2 • 11.2 / Test 2 is ignored when averaging	accept $\frac{23.2 + 24.0}{2}$ (= 23.6) accept average of tests 1 and 3	1

(iii)	unsaturation 67% (this means there is) 33% saturated fat	average was less than it should be / only 26.8 cm^3 it should have been 28.0cm^3 to give a percentage of 70%	1 1
Total marks			4

Q7.

Question	Answer	Extra information	Marks
(a)(i)	A	allow -11	1
(ii)	as the percentage of unsaturated fat decreases the melting point increases or vice versa	ignore boiling point / temperature ignore pattern linked to the percentage of saturated fat ignore numerical values	1
(iii)	D	allow 10	1
(b)	any one from: • increase the melting point • make it 'spreadable' • make it solid (at room temperature) • increase the % of saturated fat or decrease the % of unsaturated fat	do not accept to make it less healthy or more healthy ignore boiling point allow make it hard(er) ignore density / mass / viscous / thicker allow make it saturated ignore references to double / single bonds	1
(c)	stop people eating unhealthy fat		1
Total marks			5