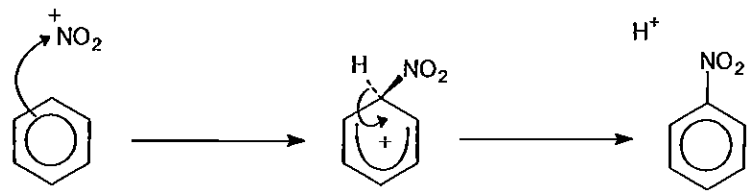
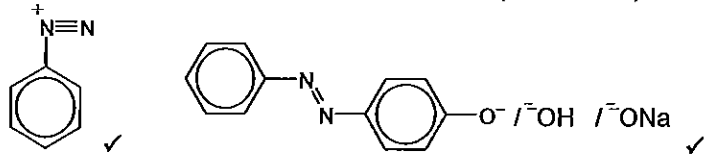
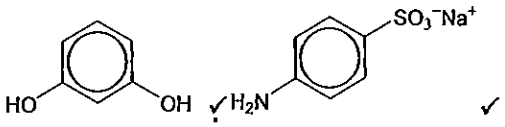
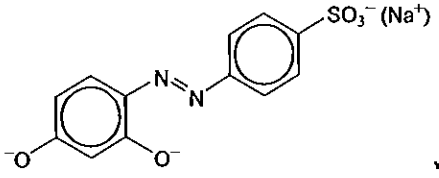
Qu.	Expected Answers		Marks
1 (a) (i)	HNO_3 + H_2SO_4 ✓ (both acids) conc ✓ 50–60°C ✓		3
(ii)	NO_2 ✓		1
(iii)	$H_2SO_4 + HNO_3 \longrightarrow NO_2^+ + H_2O + HSO_4^-$ / $2H_2SO_4 + HNO_3 \longrightarrow NO_2^+ + H_3O^+ + 2HSO_4^-$ ✓		1
(iv)	 curly arrow from π bond to electrophile ✓ intermediate ✓ curly arrow from C–H bond to π bond ✓ correct products ✓		4
(v)	moles benzene = $^{3.9}/_{78}$ = 0.050 ✓ actual moles of nitrobenzene formed = $^{4.9}/_{123}$ = 0.040 / 0.0398 **or** theoretical mass nitrobenzene = 0.050 x 123 = 6.15 (g)✓ % yield = $^{actual}/_{theoretical}$ mass/moles = = 79.67% = **80%** ✓	80% without working only scores 1 mark	3
(b) (i)	$AlBr_3$ / Fe / $FeBr_3$ ✓	**ALLOW** $AlCl_3$	1
(ii)	bromine decolourised ✓ white/cream solid/ppt. ✓ 2,4,6-tribromophenol identified by name/structure ✓ lone pair from O (of O–H) is delocalised into the ring (or orbital diagram to show) ✓ increases the (π) electron density(around the ring) ✓ Br–Br more polarised / more attracted ✓	**ora** for benzene	6
QWC	for correct use of **one** of the terms **electrophile / electrophilic / activation**		1
			[Total: 20]

Qu.	Expected Answers		Marks
2 (a)	**step 1** HNO_2 + HCl / $NaNO_2$ + HCl ✓ below 10°C ✓ **step 2** add to phenol in alkaline conditions / NaOH (below 10°C) ✓  ✓ ✓	**ALLOW** C_6H_5 not displayed **ALLOW** any substitution position in the dye	5
(b) (i)	N=N̄ circled ✓		1
(ii)	12 carbons ✓ 9 hydrogens ✓		2
(iii)	 ✓ ✓	**DO NOT ALLOW** connection errors here **ALLOW** $-SO_3H$	2
(c)	 ✓	**ALLOW** just one $\bar{O}$	1
			[Total: 11]