$$\sqrt{\frac{C}{}} \Rightarrow$$

$$\frac{T'}{T} = \sqrt{\frac{I'}{I}} = \sqrt{\frac{\left(\rho\pi\frac{4r^2}{2}\frac{t}{4}\right)4r^2}{\frac{(\rho\pi r^2 t)r^2}{2}}}$$

$$T' = 2T$$

PART 2 : CHEMISTRY

SECTION-I

1. Ans (B)

$$X^- + H^+ \rightleftharpoons HX$$

	$\frac{10\times0.1}{20}$ M	$\frac{10\times0.1}{20}$ M	0
Final	0	0	0.05 M

(10 ml HCl solution is needed for equivalent point)

At equivalent point $[H^+] = \sqrt{K_a \times C}$

$= \sqrt{10^{-8}\times 0.05}$

$\therefore$ pH $= -\log (5\times10^{-10})^{1/2} = 4.65$

2. Ans (B)

Fact based.

3. Ans (B)

$PhMgBr + ROH \rightarrow PhH$

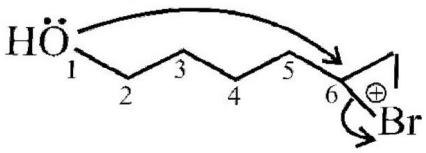
4. Ans (B)

Electrophillic addition takes place on alkene (that's alkene act as nucleophile)

5. Ans (D)

Theory

6. Ans (A)



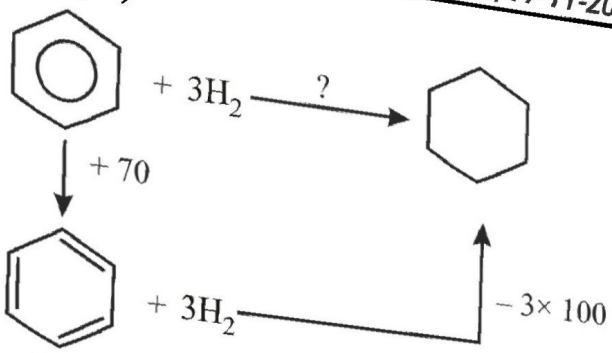
7. Ans (C)

$\Delta H = q_p$ & $\Delta U = \Delta H - \Delta(PV) = \Delta H - P.\Delta V$

$= 100\text{ kJ} - 10\times10^5\times\frac{1}{2}\times10^{-3}\times10^{-3}$

$\Delta U = 100\text{ kJ} - 0.5\text{ kJ} = 99.5\text{ kJ}.$

8. Ans (D)



$= 70 + (-300) = -230$ kJ

9. Ans (D)

$$\Delta S = nC_v \ln\frac{T_2}{T_1} + nR\ln\frac{V_2}{V_1}$$

$$= C_v \ln 2 + R\ln\left(\frac{1}{2}\right)$$

$$= (C_v - R)\ln 2$$

10. Ans (D)

$$P_{Total} = P_{HNO_3} + P_{NO_2} + P_{H_2O} + P_{O_2}$$

$$\because P_{NO_2} = 4P_{O_2} \quad \& \quad P_{H_2O} = 2P_{O_2}$$

$$\therefore \quad P_{Total} = P_{HNO_3} + 7P_{O_2}$$

$$\Rightarrow 30 - 2 = P_{O_2}\times7 \Rightarrow P_{O_2} = 4$$

$$K_p = \frac{(P_{NO_2})^4 . P_{H_2O} . P_{O_2}}{P^4_{HNO_3}}$$

$$= \frac{(4\times4)^4\times(2\times4)^2\times4}{2^4} = 2^{20}$$

$$K_p = K_C(RT)^{\Delta ng} = K_C\times(0.08\times400)^3$$

$$K_C = \frac{2^{20}}{(32)^3} = 32$$

11. Ans (B)

If backward reaction is endothermic means forward reaction is exothermic hence on addition of Cl_2 reaction will go forward & temp. will increase.

12. Ans (C)

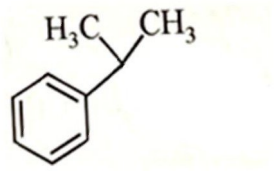
$$HA + OH^- \rightleftharpoons A^- + H_2O$$

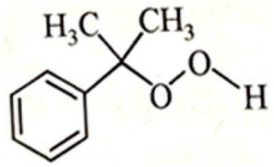
$$K_{eq} = \frac{1}{K_b} = \frac{K_a}{K_w} = \frac{10^{-4}}{10^{-14}}$$

13. **Ans (C)**

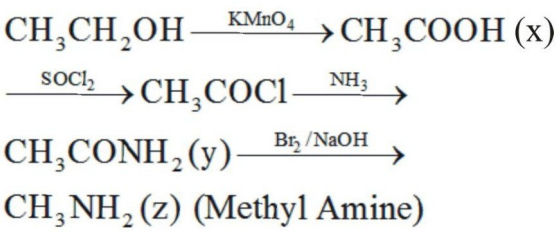
Acid halide is most reactive due to –I of Cl.

14. **Ans (B)**

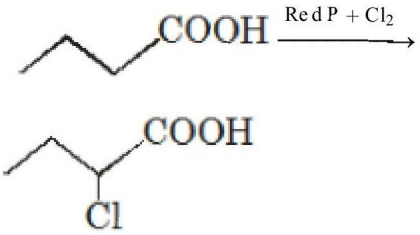
T = 

U = 

15. **Ans (C)**



16. **Ans (D)**



it is a HVZ reaction.

17. **Ans (C)**

In Glucose and galactose different is only around one carbon so they called epimer.

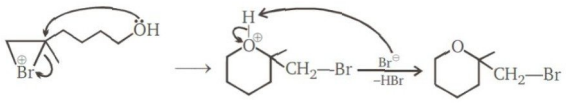
18. **Ans (C)**

Given structure is Thymine and Thymine being paired with adenine

19. **Ans (A)**

Fact

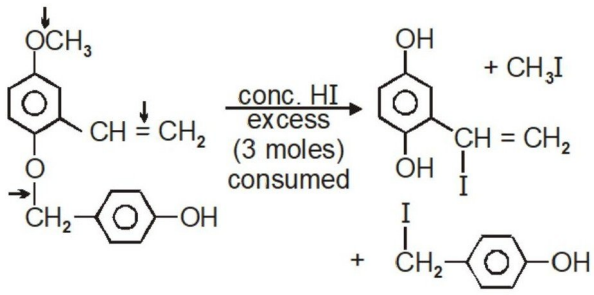
20. **Ans (C)**



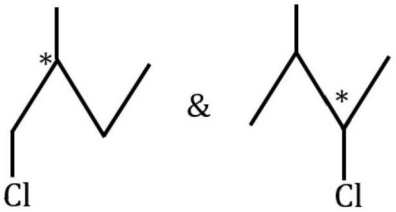
PART 2 : CHEMISTRY

SECTION-II

1. **Ans (3)**



2. **Ans (2)**



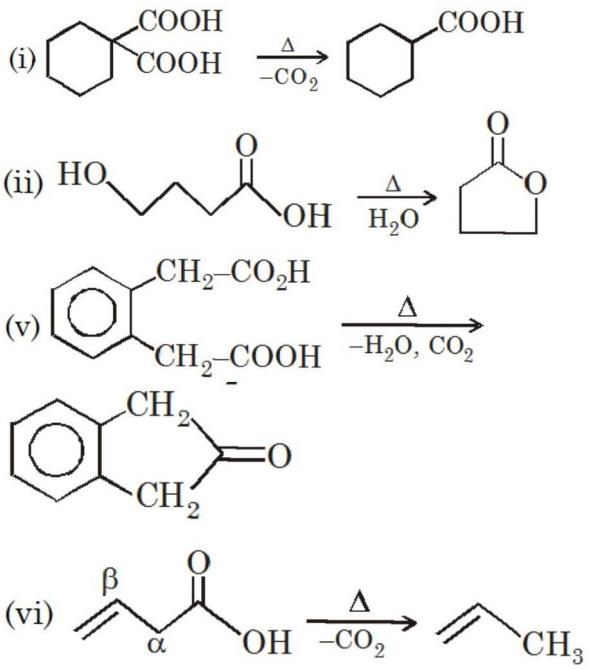
3. **Ans (2)**

W = 300 – 400 = – 100 J

W = 0.5 × ΔV bar-litre

$\Delta V = \frac{100}{0.5 \times 100} = 2$

4. **Ans (4)**



5. **Ans (1)**

P is