Q1. Ethanoyl chloride reacts with methylbenzene forming compound X according to the equation below.

If the experimental yield is 40.0%, the mass in grams of **X** (M_r = 134.0) formed from 18.4 g of methylbenzene (M_r = 92.0) is

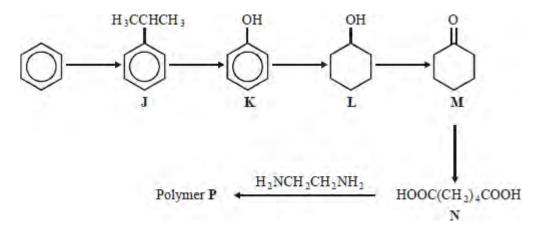
- **A** 26.8
- **B** 16.1
- **C** 10.7
- **D** 7.4

(Total 1 mark)

Q2.In a reaction which gave a 27.0% yield, 5.00 g of methylbenzene were converted into the explosive 2,4,6-trinitromethylbenzene (TNT) ($M_r = 227.0$). The mass of TNT formed was

- **A** 1.35 g
- **B** 3.33 g
- **C** 3.65 g
- **D** 12.34 g

Q3. This question is about the following reaction scheme which shows the preparation of polymer P.



If 1.0 kg of benzene gave 0.98 kg of J, the percentage yield of J was

- **A** 64
- **B** 66
- **C** 68
- **D** 70

(Total 1 mark)

Q4.In which one of the following reactions is the role of the reagent stated correctly?

	Reaction	Role of reagent
Α	$TiO_2 + 2C + 2CI_2 \rightarrow TiCI_4 + 2CO$	TiO₂ is an oxidising agent
В	$HNO_3 + H_2SO_4 \rightarrow H_2NO_3^+ + HSO_4^-$	HNO₃ is a Brønsted-Lowry acid
С	CH₃COCI + AICI₃ → CH₃CO⁺ + AICI4	AICI ₃ is a Lewis base
D	$2CO + 2NO \rightarrow 2CO_2 + N_2$	CO is a reducing agent

Q5.The relative molecular mass (M_r) of benzene-1,4-dicarboxylic acid is

- **A** 164
- **B** 166
- **C** 168
- **C** 170

(Total 1 mark)

Q6.1,3-dinitrobenzene can be prepared by heating nitrobenzene with a mixture of fuming nitric acid and concentrated sulphuric acid. The reaction can be represented by the following equation.

If the yield of the reaction is 55%, the mass of 1,3-dinitrobenzene produced from 12.30 g of nitrobenzene is

- **A** 16.90 g
- **B** 16.80 g
- **C** 9.30 g
- **D** 9.24 g

Q7. Which one of the following can react both by nucleophilic addition and by nucleophilic substitution?

$$\begin{array}{ccc} & CH_3-C-CH=CH_2 \\ \parallel & & O \end{array}$$

$$\begin{array}{ccc} & \text{H}_2\text{C}-\text{CH}_2-\text{C} \\ & & \text{H} \end{array}$$

$$H_2C-CH=CH_2$$

(Total 1 mark)

Q8.Which one of the following does **not** contain any delocalised electrons?

- A poly(propene)
- **B** benzene
- **C** graphite
- **D** sodium