

This Question Paper contains 20 printed pages.

(Part - A & Part - B)

Sl.No. 1100753

**052 (E)**

(MARCH, 2019)

SCIENCE STREAM

(CLASS - XII)

પ્રશ્ન પેપરનો સેટ નંબર જેની સામેનું વર્તુળ OMR શીટમાં ઘટ્ટ કરવાનું રહે છે.

Set No. of Question Paper, circle against which is to be darkened in OMR sheet.

**11**

Part - A : Time : 1 Hour / Marks : 50

Part - B : Time : 2 Hours / Marks : 50

(Part - A)

Time : 1 Hour]

[Maximum Marks : 50

**Instructions :**

- 1) There are 50 objective type (M.C.Q.) questions in Part - A and all questions are compulsory.
- 2) The questions are serially numbered from 1 to 50 and each carries 1 mark.
- 3) Read each question carefully, select proper alternative and answer in the O.M.R. sheet.
- 4) The OMR sheet is given for answering the questions. The answer of each question is represented by (A) O, (B) O, (C) O, (D) O. Darken the circle ● of the correct answer with ball-pen.
- 5) Rough work is to be done in the space provided for this purpose in the Test Booklet only.
- 6) Set No. of Question Paper printed on the upper-most right side of the Question Paper is to be written in the column provided in the OMR sheet.
- 7) Use of simple calculator and log table is allowed, if required.

1) Which are the correct uses of potassium dichromate from following?

- (i) As an indicator in redox titration
  - (ii) As a reagent in COD measurement
  - (iii) As reducing agent in synthesis of organic compounds
  - (iv) In leather industry
- (A) (i)  
(B) (i) and (iii)  
(C) (ii) and (iv)  
(D) (i), (ii) and (iii)

Rough Work

- 2) Sentence (A) and its reason (R) is given below. For it which option is correct from given options?

Sentence (A) : Atomic radii from Cr to Cu is almost similar

Reason (R) : Shielding effect of entering electron in 3d orbital decreases repulsion force of 4s orbital electrons towards nucleus.

- (A) A and R both are true. R is correct explanation of A.  
(B) A and R both are true. R is not correct explanation of A.  
(C) A is correct, R is wrong.  
(D) A is wrong, R is correct.

- 3) For which complex from following value of  $\Delta_o$  will lowest?

- (A)  $[\text{Co}(\text{CN})_6]^{3-}$   
(B)  $[\text{Co}(\text{NH}_3)_6]^{3+}$   
(C)  $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$   
(D)  $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$

- 4) Which is primary valency and secondary valency of transition metal ion in ammonium diammine dioxalato cobaltate (III) respectively?

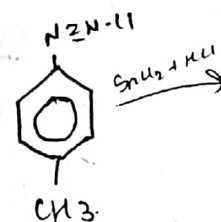
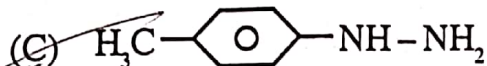
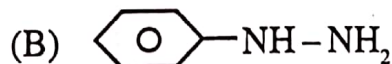
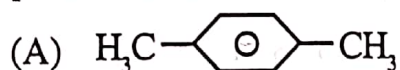
- (A) 3,4  
(B) 3,6  
(C) 0,4  
(D) 1,6

- 5) Which of the following pair is a example of linkage isomerism?

- (A)  $[\text{Cr}(\text{H}_2\text{O})_6] \text{Cl}_3$  and  $[\text{Cr}(\text{H}_2\text{O})_5 \text{Cl}] \text{Cl}_2 \cdot \text{H}_2\text{O}$   
(B)  $[\text{Co}(\text{NH}_3)_5 \text{NO}_3] \text{Cl}$  and  $[\text{Co}(\text{NH}_3)_5 \text{Cl}] \text{NO}_3$   
(C)  $[\text{Co}(\text{NH}_3)_6]^{3+} [\text{Cr}(\text{CN})_6]^{3-}$  and  $[\text{Cr}(\text{NH}_3)_6]^{3+} [\text{Co}(\text{CN})_6]^{3-}$   
(D)  $[\text{Co}(\text{NO}_2)(\text{NH}_3)_5] \text{Cl}_2$  and  $[\text{Co}(\text{ONO})(\text{NH}_3)_5] \text{Cl}_2$

Rough Work

6) p-Toluenediazonium chloride  $\xrightarrow{\text{SnCl}_2 + \text{HCl}}$  what will be product of reaction?



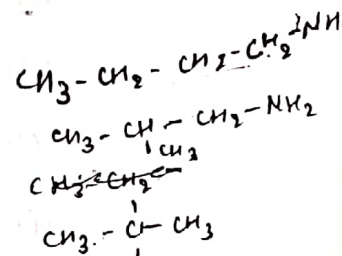
7) Which compound is optically active?

(A) Butan - 1 - amine

(B) Butan - 2 - amine

(C) 2 - methylpropan - 1 - amine

(D) 2 - methylpropan - 2 - amine



8) Which compound by reduction with  $\text{LiAlH}_4$  will give secondary amine?

(A) Nitroethane

(B) Ethyl isocyanide

(C) Ethanamide

(D) Ethanenitrile

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9) Which compound will give carbylamine test?

- (A) Benzylamine
- ✓ (B) Diphenylamine
- (C) N, N - dimethylaniline
- (D) N-methyl benzenamine

10) In which of the following solid substance dispersion forces exist?

- ✓
- (A)  $\text{SiO}_2$
  - (B)  $\text{CO}_2$
  - (C)  $\text{H}_2\text{O}$
  - (D)  $\text{SO}_2$

✓ 11) In a crystal of compound having molecular formula  $\text{X}_2\text{Y}_3$ , Y atoms are arranged as CCP, then what fraction of tetrahedral voids will be covered by X atoms?

- (A)  $\frac{1}{3}$
- (B)  $\frac{2}{3}$
- (C)  $\frac{1}{4}$
- (D)  $\frac{3}{4}$

12) In which of the following defect some of the cations are arranged in the interstitial site?

- (A) Schottky defect
- (B) Metal excess defect
- (C) Frenkel defect
- (D) Interstitial defect

13) From the following which type of magnetic substance magnetite is known?

- (A) Diamagnetic
- (B) Ferromagnetic
- (C) Antiferromagnetic
- (D) Ferrimagnetic

14) Which of the following aqueous solution has highest boiling point?

- (A) 0.1 m NaCl
- (B) 0.2 m Ba(NO<sub>3</sub>)<sub>2</sub>
- (C) 0.01 m Na<sub>3</sub>PO<sub>4</sub>
- (D) 0.03 m KNO<sub>3</sub>



15) What is the weight to volume ppm of 0.05% w/v  $\text{CaCl}_2$  aqueous solution?

(A) 500

(B) 0.05

(C) 50

(D) 5

$$\frac{0.05 \times 10^6}{100 \times 10^3}$$

$$= \frac{5 \times 1000}{100}$$

16) Which of the following is appropriate for the solution made by mixing acetone and carbondisulphide?

(A) Negative deviation from Raoult's law

(B)  $\Delta H_{\text{mix}} < 0$

(C)  $\Delta V_{\text{mix}} > 0$

(D) Obey Raoult's law

17) Which of the following will be possible in electrochemical cell obtained from  $E^\circ_{\text{Cl}_2/2\text{Cl}^-} = 1.36 \text{ V}$  and  $E^\circ_{\text{Br}_2/2\text{Br}^-} = 1.09 \text{ V}$ ?

(A)  $2\text{Cl}^- + 2\text{Br}^- \rightarrow \text{Cl}_2 + \text{Br}_2$

(B)  $2\text{Br}^- + \text{Cl}_2 \rightarrow \text{Br}_2 + 2\text{Cl}^-$

(C)  $\text{Br}_2 + 2\text{Cl}^- \rightarrow 2\text{Br}^- + \text{Cl}_2$

(D)  $\text{Cl}_2 + \text{Br}_2 \rightarrow 2\text{Cl}^- + 2\text{Br}^-$

18) On which of the following factor ionic conductivity of solution does not depend?

- (A) Concentration of electrolyte
- (B) Nature of solvent
- (C) Nature of electrolyte
- (D) Size of molecules produce in solution

19) On charging of lead storage cell \_\_\_\_\_.

- (A)  $\text{H}_2\text{SO}_4$  of solution is consumed
- (B) Solution becomes dilute
- (C) Pb at electrode is consumed
- (D)  $\text{PbO}_2$  is deposited on one of the electrode

20) What is correct for  $\wedge_m^\circ(\text{NH}_4\text{OH})$ ?

- (A)  $\wedge_m^\circ(\text{NH}_4\text{Cl}) + \wedge_m^\circ(\text{NaCl}) - \wedge_m^\circ(\text{NaOH})$
- (B)  $\wedge_m^\circ(\text{NH}_4\text{Cl}) + \wedge_m^\circ(\text{NaOH}) - \wedge_m^\circ(\text{NaCl})$
- (C)  $\wedge_m^\circ(\text{NaOH}) + \wedge_m^\circ(\text{NH}_4\text{Cl}) - \wedge_m^\circ(\text{HCl})$
- (D)  $\wedge_m^\circ(\text{NaCl}) + \wedge_m^\circ(\text{NH}_4\text{Cl}) + \wedge_m^\circ(\text{NaOH})$

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21) Which metal can be purified by liquation?

- (A) Tin
- (B) Lead
- (C) Iron
- (D) Nickel

22) Which method is not used for concentration of ores?

- (A) Magnetic separation
- (B) Smelting
- (C) Froth floatation
- (D) Hydraulic washing of complex

23) In which form of complex, platinum is dissolved in aqua regia?

- (A)  $[\text{Pt}(\text{NO}_3)_2\text{Cl}_2]$
- (B)  $[\text{Pt}(\text{NO}_3)\text{Cl}_3]^{2-}$
- (C)  $[\text{PtCl}_6]^{2-}$
- (D)  $[\text{PtCl}_4]^{3-}$

24) Which explosive substance is obtained, when proportion of dichlorine gas is more in the reaction of dichlorine gas with ammonia gas?

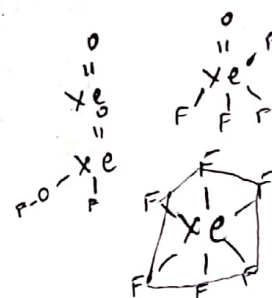
- (A) Nitrogen (II) oxide
- (B) Nitrogen trichloride
- (C) Ammonium chloride
- (D) Ammonium chloride and Dinitrogen gas



Rough Work

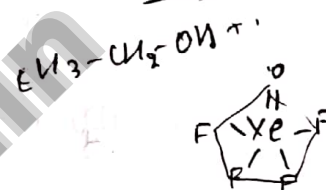
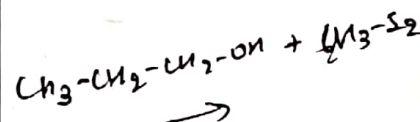
25) Which of the following compound of Xenon possesses square pyramidal structure?

- (A)  $\text{XeO}_2\text{F}_2$   
 (B)  $\text{XeO}_3$   
 (C)  $\text{XeOF}_4$   
 (D)  $\text{XeF}_6$



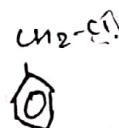
26) Which of the following substance does not produce Triiodomethane with the mixture of alkali and  $\text{I}_2$ ?

- (A) Propan - 1 - ol  
 (B) Dimethyl ketone  
 (C) Ethanol  
 (D) Ethanal



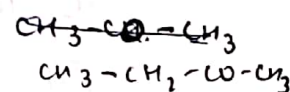
27) Which compound will give unimolecular nucleophilic substitution reaction easily with aqueous  $\text{NaOH}$ ?

- (A)  $\text{C}_6\text{H}_5-\text{CH}(\text{Cl})-\text{CH}_3$   
 (B)  $\text{C}_6\text{H}_5-\text{CH}_2-\text{CH}_2-\text{Cl}$   
 (C)  $\text{C}_6\text{H}_5-\text{C}(\text{Cl})(\text{CH}_3)-\text{CH}_3$   
 (D)  $\text{C}_6\text{H}_5-\text{CH}_2-\text{Cl}$

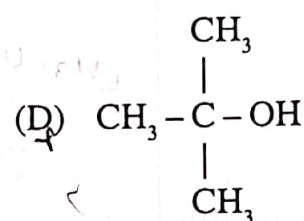
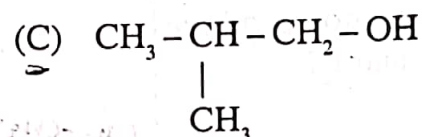
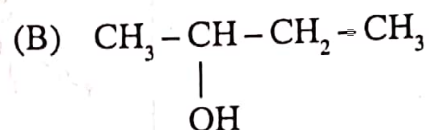
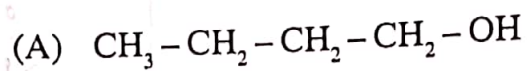


28) Which substance is added in chloroform before the use of it as anesthetic?

- (A) Acetone  
 (B) Ethyl alcohol  
 (C) Methyl Ethyl ketone  
 (D) Methylene chloride



29) Substance A  $\xrightarrow[573\text{ K}]{\text{Cu}}$  Isobutylene which is the structural formula of substance A in this reaction?



30) How much litre of dihydrogen gas will be produced at STP, in the reaction of ethanol with 12 gram Mg? ( $\text{Mg} \equiv 24$  gram /mole).

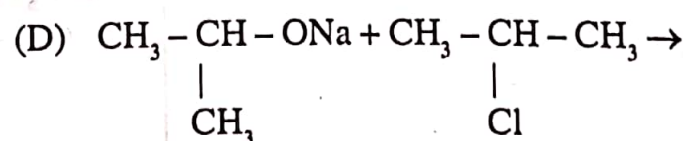
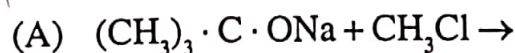
(A) 11.2 litre

(B) 22.4 litre

(C) 2.24 litre

(D) 5.6 litre

31) By which of the following reaction ether compound will be obtained easily?



32) Which type of polymer, Novolac is belived?

- (A) Linear
- (B) Branched chain
- (C) Cross linked
- (D) Natural

33) Which option is correct for synthetic polymer?

- (A)  $\overline{M}_n = \overline{M}_w$
- (B)  $\overline{M}_n \geq \overline{M}_w$
- (C)  $\overline{M}_w > \overline{M}_n$
- (D)  $\overline{M}_w < \overline{M}_n$

34) Which drug is non-narcotic and analgesic?

- (A) Morphine
- (B) Aspirin and paracetamol
- (C) Penicillin
- (D) Veronal

35) Which type of detergent is LAS?

- (i) Anionic (ii) Cationic (iii) Biosoft (iv) Biohard

- (A) (i) and (iv)
- (B) (i) and (iii)
- (C) (ii) and (iii)
- (D) (ii) and (iv)

36) By which enzyme Lactose is hydrolyzed?

- (A) Invertase
- (B) Maltase
- (C) Emulsin
- (D) Zymase

37) By deficiency of which vitamin, pernicious anemia disease is caused?

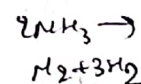
- (A) Cyano cobalamine
- (B) Ascorbic acid
- (C)  $\alpha$  - Tocopherol
- (D) Biotin

38) Which linkage is proper for nucleotide?

- (A) Sugar - base
- (B) Base - phosphate
- (C) Sugar - base - phosphate
- (D) Phosphate - sugar - base

39) The decomposition of  $\text{NH}_3$  on the platinum surface is zero order reaction. If  $K = 2.5 \times 10^{-4} \text{ mol/litre second}^{-1}$ , what will be the rate of production of  $\text{H}_2$  in  $\text{mol/litre second}^{-1}$  unit?

- (A)  $2.5 \times 10^{-4}$
- (B)  $7.5 \times 10^{-4}$
- (C)  $5.0 \times 10^{-5}$
- (D)  $0.5 \times 10^{-6}$



$$T_2 = \frac{R_0}{2K}$$

$$\frac{d[\text{N}_2]}{dt} = \frac{1}{2} \frac{d[\text{H}_2]}{dt}$$

40) What is the value of slope in the graph of  $\log_{10} K$  against  $\frac{1}{T}$ ?

(A)  $-\frac{E_a}{R}$

(B)  $-\frac{E_a}{2.303 R}$

(C)  $-\frac{K}{2.303}$

(D)  $-K$

41) Which of the following relation is correct for elementary bimolecular reaction?

(A) Order of reaction  $>$  molecularity

(B) Order of reaction  $\leq$  molecularity

(C) Order of reaction  $=$  molecularity

(D) Order of reaction  $<$  molecularity

42) Which equation is true for Langmuir adsorption isotherm at low pressure?

(A)  $\frac{x}{m} = \frac{b}{a}$

(B)  $\frac{x}{m} = ap$

(C)  $\frac{x}{m} = \frac{1}{n} \times p$

(D)  $\frac{x}{m} = \frac{a}{b}$



43) From which enzymes are made?

- (A) Carbohydrates
- (B) Lipid
- (C) Vitamin
- (D) Protein

44) Which is decreasing order of coagulating power for positive charged sol?

- (A)  $\text{SO}_4^{-2} > \text{PO}_4^{-3} > \text{Cl}^-$
- (B)  $\text{PO}_4^{-3} > \text{SO}_4^{-2} > \text{Cl}^-$
- (C)  $\text{Cl}^- > \text{SO}_4^{-2} > \text{PO}_4^{-3}$
- (D)  $\text{Cl}^- > \text{PO}_4^{-3} > \text{SO}_4^{-2}$

45) 2, 3 - Dimethylbut - 2 - en  $\xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$  which final product is obtained in this reaction?

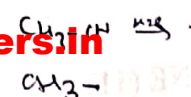
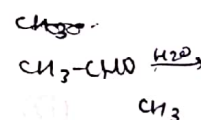
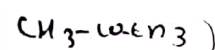
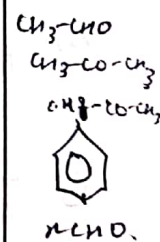
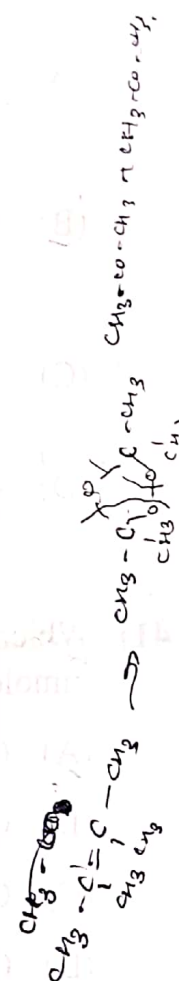
- (A) Propanal, Propanone
- (B) Propanone
- (C) Propanal, Ethanal
- (D) Propanal, Propanol

46) Which of the following compound will give disproportionation reaction in the presence of alkali?

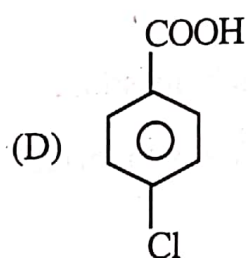
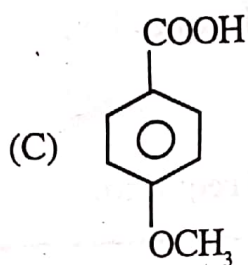
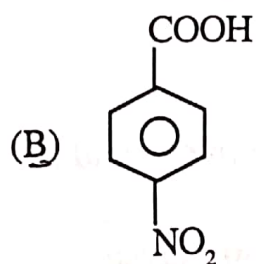
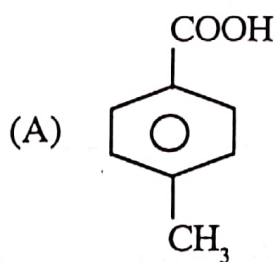
- (A) Acetaldehyde
- (B) Acetone
- (C) Acetophenone
- (D) Formaldehyde

47) By hydrolysis of which substance carboxylic acid can be obtained?

- (A) Acetonitrile
- (B) Propanoyl chloride
- (C) Acetone
- (D) Acetaldehyde

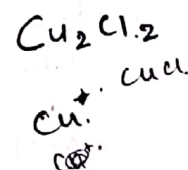


48) For which acid the value of  $pK_a$  is highest?



49) Which is the magnetic momentum of cuprous chloride on the basis of axial rotation?

- (A) 1.73 B.M.  
(B) 0.0 B.M.  
(C) 4.90 B.M.  
(D) 2.83 B.M.



50) Which alloy is used by dentist to fill the cavity in the tooth?

- (A) Hg + Ag + Cu  
(B) Hg + Ag + Sn + Cu + Zn  
(C) Hg + Ag + Cu + Sn  
(D) Ag + Sn + Cu + Zn

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(P.T.O.)

**052 (E)**  
(MARCH, 2019)  
SCIENCE STREAM  
(CLASS-XII)

(Part - B)

Time : 2 Hours]

[Maximum Marks : 50

Instructions :

- 1) Write in a clear legible handwriting.
- 2) There are three sections in Part - B of the question paper and total 1 to 18 questions are there.
- 3) All the questions are compulsory. Internal options are given.
- 4) The numbers at right side represent the marks of the question.
- 5) Start new section on new page.
- 6) Maintain sequence.
- 7) Use of simple calculator and log table is allowed, if required.

SECTION - A

■ Answer the following Q. No. 1 - 8 in brief. 2 marks for each question. [16]

- 1) Give reason : Electrical conductivity of silicon increases with increase in temperature.
- 2) Explain the method to remove iron impurity from matte with chemical equations. (Figure is not required).
- 3) Draw structural formula of pyrophosphoric acid and peroxodisulphuric acid.

OR

$\text{Al}_2\text{O}_3$  is amphoteric in nature, mention it by chemical equation.

- 4) Transition metals and its compounds in solid state have catalytic property. Explain in short.
- 5) Explain mutarotation in terms of glucose. (Structure is not necessary).

OR

What is peptide bond? Clarify peptide bond with example of dipeptide.

- 6) Give definition
  - a) Addition homopolymer
  - b) Degree of polymerization

33  
26

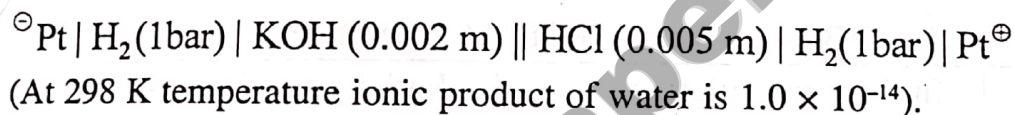
- 7) Give the equation for preparation of biodegradable polymer of polyester class. Which properties of monomers are there in this compound?
- 8) Compounds are given in column I and uses of compounds are given in column II. Match compounds of column I with column II.

Column I	Column II
1) Sodium Benzoate	(P) Relief from acidity
2) Furacine	(Q) To stop oxidation of food
3) Alitame	(R) To remove dirt on surface
4) BHT	(S) To protect food from fungus
	(T) As an antiseptics
	(U) Artificial compound used for sweetness

### SECTION - B

- Answer the following Q.No. 9-14 in detail, 3 marks for each question. [18]

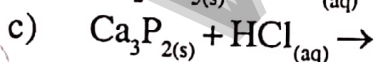
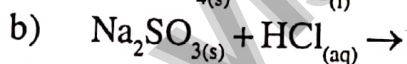
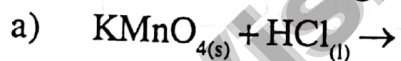
- 9) Calculate the value of cell potential of the following cell at 298 K.



OR

How many spoons can be electroplated by silver when 5 ampere current is passed through electrolytic cell of  $\text{AgNO}_3$  for 2.5 hours? Efficiency of the cell is 80% and 0.01 gram Ag layer is deposited on each spoon. ( $\text{Ag} = 108\text{ gm/mole}$ ).

- 10) Complete the following reactions and balance it.



- 11) Write following organic conversion with appropriate conditions in three steps. 4-Bromo Aniline from aniline.

- 12) Write the difference between physical adsorption and chemical adsorption. (any six points).

- 13) Write three different equations for preparation of corresponding alkane from acetone.

- 14) Explain Hofmann reaction with two examples.



SECTION - C

- Answer the following Q. No. 15 -18 essay type questions in detail. 4 marks for each question. [16]

15) Write Van't - Hoff's laws of osmotic pressure, give it's mathematic formula and derive a formula to find osmotic pressure.

16) Write only chemical reaction for the preparation of following compounds from phenol.

- a) Phenyl acetate  
b) Benzene  
c) P - Bromophenol  
d) 1, 4 - Benzoquinone

17) The following are the results of the three experiments carried for determination of differential rate of reaction

$A + 2B \rightarrow \text{Product}$  at definite temperature.

	Initial concentration of reactants mol lit <sup>-1</sup>		Initial rate of reaction $-\frac{d[A]}{dt}$ mol lit <sup>-1</sup> sec <sup>-1</sup>
	[A] <sub>0</sub>	[B] <sub>0</sub>	
1	0.02	0.01	$3.5 \times 10^{-3}$
2	0.02	0.02	$1.4 \times 10^{-2}$
3	0.04	0.01	$7.0 \times 10^{-3}$

- a) Deduce the differential rate law  
b) Calculate order of reaction and  
c) Find out value of rate constant

OR

The rate constant of a reaction is  $3 \times 10^{-3} \text{ min}^{-1}$  at 27°C, at 47°C its value is  $9 \times 10^{-3} \text{ min}^{-1}$ , then calculate the energy of activation of the reaction. What will be its rate constant at 308 K?

18) Explain the geometrical structures of tetra cyano and tetrachlorido complexes of Nickle (II) on the basis of magnetic property.

