

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-I
Paper-I

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. (a) What do you mean by quantum number?
 (b) Write down all the quantum number for $4s^1$, $5p^1$, $3d^7$, $5f^3$.
2. (a) Write down the electronic configuration of the following:
 Fe^{3+} , Fe^{2+} , Cu^+ , Hg^{2+} , Pb^{2+} , K^+ , Cr^{3+}
 (b) What are the values of n, l, m and s for the last electron that enters in the following atoms:

Cr	Co	K	Br	
Atomic number:	24	27	19	35
3. What is common ion effect? How does common ion effect for the solubility of salt? Describe the application of common and solubility product in the salt analysis.
4. Write down the important ores of Boron. How is boron extracted from its ores? Describe the diagonal relationship between boron and silicon. How does boron react with:
 (a) H_2SO_4 (b) $NaOH$
5. What are noble gases? How noble gases is isolated from atmospheric air? How they are separated from each other?
6. How does gold occur in nature? How gold gases is extracted on large scale from auriferous quartz by cyanide method? What do you mean by 18 carats gold? Explain Colloidal gold.
7. Define ionisation potential, electron affinity and electronegativity. Discuss the factors which affect three.
8. What are main postulates of valance bond theory purposed by Heitter and extended by Pauling and Stater expression Pie and Sigma bonds by giving with diagram.
9. (a) $NaCl$ has f.c.c. structure. How may Na^+ and Cl^- are there in unit cell.
 (b) $CsCl$ has a body centred cubic (b.c.c.) structure. How many Cs^+ and Cl^- are there in unit cell.
10. Explain the radius ratio rule and ratio of Lattice which Co-ordination number are useful in the determination of structure of crystal of large number of organic compound give its at-least two examples.



Examination Programme, 2017 (Revised)
B.Sc (Part – I) All Honours Subjects
Except Home Science, Geography & Statistics Honours
 (गृह विज्ञान, भूगोल और सांख्यिकी ऑनर्स को छोड़कर)

Date	Papers.	Time	Examination Centre
20/3/2017	(Hons) P-I	3.30 to 6.30 pm	Nalanda Open University, Patna
22/3/2017	(Hons) P-II	3.30 to 6.30 pm	Nalanda Open University, Patna
24/3/2017	Rastrabhsha-100 or Hindi+Urdu 100	3.30 to 6.30 pm	Nalanda Open University, Patna
27/3/2017	Math (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna
28/3/2017	Geography (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna
29/3/2017	Chemistry (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna
30/3/2017	Home Science (Sub)-P I	8.00 to 11.00 am	Nalanda Open University, Patna
31/3/2017	Zoology (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna
03/4/2017	Physics (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna
04/4/2017	Botany (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna
05/4/2017	Statistics (Sub) P-I	8.00 to 11.00 am	Nalanda Open University, Patna

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-I
Paper-II

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

- State and explain first law of thermodynamics.
 - Derive a relation between heat capacity at constant pressure and constant volume.
- Why does a solution exhibit abnormal osmotic pressure? What is Van't Hoff factor and how is it related to degree of dissociation of an electrolyte?
- What do you understand by elevation of boiling point? Deduce an expression for molecular weight of a solute with elevation in boiling point of the solution.
- What are alcohols and how are they classified? How will you distinguish primary, secondary alcohols? Give equations wherever possible.
- Give I.U.P.A.C of following compounds:
 - $\text{CH}_3-\text{CH}_2-\text{CH}=\text{CH}-\text{CH}-\text{CH}_2-\text{COOH}$
 - $\text{CH}_3-\text{CH}_2-\text{C}=\underset{\begin{array}{c} \text{P} \\ | \end{array}}{\text{C}}-\text{CH}_3$
 - $\text{CH}_3\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}_2-\underset{\begin{array}{c} \text{P} \\ | \end{array}}{\text{C}}-\text{CH}_3$
 - $\text{CH}_3\text{CH}=\underset{\begin{array}{c} | \\ \text{CH}_2\text{CH}_3 \end{array}}{\text{CH}}-\text{CH}_2\text{CH}=\text{CH}$
- Write the structural formula of the following compounds:
 - 3-Bromohex-1, 3, 5 triene
 - Hexane-, 6-dioic acid
 - 3-methyl-1 methoxy butane
 - 1-chloro-4-methyl-pentane
- How will you synthesize following compounds from malonic ester?
 - Succinic acid
 - Cinnamic acid
 - Acetoacetic acid
- How are urea prepared? Explain why urea is basic? How would you identify urea in laboratory? How does urea react with (i) hydrazine (ii) nitrous acid.
- What is the chief source of citric acid? How is it obtained in the pure state establish the structure of citric acid?
- How nitrogen is estimated by Duma method experimentally? Describe it with necessary reactions.
- Explain the term:
 - State function
 - Lassainges test
 - Addition reaction
 - Connizzaro's reaction



Programme of B.Sc. Part-I Chemistry (Hons.)
Practical Counselling and Examination 2017
Venue : 4th Floor, Chemistry Lab, Bismaun Bhawan, Patna

(A) Practical Counselling Class

Date	Paper	Time	Roll No.
06.04.2017	I & II	11:30 AM to 4:00 PM	All Old Students & 160470001 to 160470040
07.04.2017	I & II	11:30 AM to 4:00 PM	160470041 to 160470080
08.04.2017	I & II	11:30 AM to 4:00 PM	160470081 to 160470120
11.04.2017	I & II	11:30 AM to 4:00 PM	1604700121 to 160470170

(B) Practical Examination

Date	Paper	Time	Roll No.
12.04.2017	I	11:30 AM to 2:30 PM	All Old Students & 160470001 to 160470040
	II	02:45 PM to 05:45 PM	
13.04.2017	I	11:30 AM to 02:30 PM	160470041 to 160470080
	II	02:45 PM to 05:45 PM	
15.04.2017	I	11:30 AM to 02:30 PM	160470081 to 160470120
	II	02:45 PM to 05:45 PM	
19.04.2017	I	11:30 AM to 02:30 PM	160470121 to 160470170
	II	02:45 PM to 05:45 PM	

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Subsidiary), Part-I
Paper-I

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

- What is Kohlrausch's law? Explain the uses in (i) determination of equivalent conductance of acetic acid at infinite dilution (ii) Determination of degree of ionization of weak electrolyte.
- State and explain conductance specific conductance and equivalent conductance. What is effect of concentration on it.
- (a) Define First Law of thermodynamics what is the mathematical statement of the law?
 (b) What are extensive and intensive properties?
- Derive an expression for the work done by an ideal gas under Isothermal conditions.
- What is order of reaction? What are the methods to determine order of reaction. Explain at least one.
- (a) Give I.U.P.A.C names of the following compounds
 (i) $\begin{array}{c} \text{CH}_2-\text{COOH} \\ | \\ \text{CH}_2-\text{COOH} \end{array}$ (ii) $\begin{array}{ccccccc} \text{CH}_3 & -\text{CH} & -\text{CH} & -\text{CH} & -\text{CHO} \\ & | & | & | & \\ & \text{NH}_2 & \text{Cl} & \text{CN} & \end{array}$
 (iii) $\begin{array}{c} \text{C}_2\text{H}_5 \\ | \\ \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$ (v) $\begin{array}{ccccccc} & & \text{CH}_3 & & & & \\ & & | & & & & \\ \text{CH}_3 & -\text{CH}_2 & -\text{C} & =\text{C} & -\text{C} & =\text{CH}_2 \\ & & | & | & | & & \\ & & \text{H} & \text{H} & \text{H} & & \end{array}$
 (b) Write the structural formula of the following compounds
 (i) 1,3,5-trimethyl Benzene (ii) Pentane-2,3-dione
 (iii) 2-Ethylhexan-1-ol (iv) H₂ in presence of Pd/BesO₄
- Describe the general methods of preparation of acyl chloride. Give its reaction with (i) R-OH (ii) NH₃ (iii) Benzene (iv) H₂ in presence of Pd/BesO₄.
- How Tartaric acid can be manufactured from Aogol? Give its rxn with (i) H₂
 (ii) CH₃COCl (iii) Fenton's reagent.
- How Aniline is prepared in Laboratory. Give its rxn with (i) Excess of Br₂ water
 (ii) CH₃COCl (iii) HNO₃ (dil).
- Write notes on any two of the following:-
 (a) Protein (b) Addition reaction
 (c) Concentration cell (d) Reversible process



Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-II
Paper-III

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

- How is potential developed in a cell ? What is function of a salt bridge in a cell ? What is difference between primary and secondary cell ?
- Describe Thomson's method to determine specific charge (e/m) of an electron.
- Discuss the position of chromium in periodic table. Write the name and formula of natural ores of Chromium. How can you obtain $K_2Cr_2O_7$ from chromite iron ore ? How can you obtain chromyl chloride from $K_2Cr_2O_7$? Write important alloys of chromium.
- Explain different types of isomerism show in Co-ordination chemistry ?
- Prepare hydroxyl amine by Two methods. Discuss its oxidizing and reducing behaviours. What are its uses.
- Write down the preparation and properties of following :-
 (a) Hydrazine (b) Hydroxylamine (c) Tel
- Write short notes on :-
 (a) Sodium Thio sulphate (b) Silica Gel (c) Silicones.
- What do you understand by Werner's theory for formation of Complex Compounds ?
- (a) How Copper is estimated Volumetrically by iodometric titration.
 (b) Write down the principle and process to estimate the amount of Ba^{++} in the given solution $BaCl_2$.
- What do you mean by Water Pollution ? Classify water pollutants. What is acid rain ? What are its causes ?



Examination Programme, 2017
(Bachelor of Science (Part-II))

All Subjects Except B.Sc Geography & Home Science (Honours)

Date	Paper	Time	Name of Examination Centre
23/2/2017	HONOURS PAPER – III	8.00 to 11.00 am	Nalanda Open University, Patna
25/2/2017	HONOURS PAPER – IV	8.00 to 11.00 am	Nalanda Open University, Patna
27/2/2017	Hindi 100 or Ur 50+Hn 50	8.00 to 11.00 am	Nalanda Open University, Patna
01/3/2017	(SUB.) (Botany - II)	8.00 to 11.00 am	Nalanda Open University, Patna
02/3/2017	(SUB.) (Mathematics - II)	8.00 to 11.00 am	Nalanda Open University, Patna
04/3/2017	(SUB.) (Chemistry - II)	8.00 to 11.00 am	Nalanda Open University, Patna
06/3/2017	(SUB.) (Physics - II)	8.00 to 11.00 am	Nalanda Open University, Patna
07/3/2017	(SUB.) (Zoology - II)	8.00 to 11.00 am	Nalanda Open University, Patna
09/3/2017	(SUB.) (Geography - II)	8.00 to 11.00 am	Nalanda Open University, Patna
11/3/2017	(SUB.) (Home Science- II)	8.00 to 11.00 am	Nalanda Open University, Patna
16/3/2017	(SUB) Statistics-II)	8.00 to 11.00 am	Nalanda Open University, Patna

Nalanda Open University, Patna

*Programme of B.Sc. Part-II Chemistry (Hons.),
 Practical Class and Practical Examination, 2017*

Venue:- 4th Floor, Chemistry Lab, Biscomaun Bhawan, Patna

(A) Practical Counselling Class

Date	Paper	Time	Roll No
16.03.2017	III & IV	11:30 AM to 5:30 PM	All Old Students & Roll No- (150470001 to 150470035)
17.03.2017	III & IV	11:30 AM to 5:30 PM	(150470036 to 150470091)

(B) Practical Examination

Date	Paper	Time	Roll No
21.03.2017	III & IV	11:30 AM to 5:45 PM	All Old Students & Roll No- (150470001 to 150470035)
23.03.2017	III & IV	11:30 AM to 5:45 PM	(150470036 to 150470091)

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-II
Paper-IV

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

1. What are amino acids? Give formula and names of any two amino acids. Give general methods for the preparation of amino acids. Write a short notes on Strecker's synthesis of amino acid.
2. What are Carbohydrate? How are they classified? Establish the open chain structure of fructose.
3. Define emulsion and gel. Distinguish between them with examples. What do you mean by the weeping gel.
4. Write notes on
(a) Tyndal effect (b) Hardy-Schultz rules (c) Brownian movement
5. Explain the mechanism of electrophilic substitution in benzene and its homologue.
6. Discuss the carbonium ion rearrangement by taking example of pinacol pinalone
7. (a) How is benzaldehyde prepared from
(i) Benzene (ii) Benzoyl chloride (iii) Toluene
(b) Write notes on
(i) Clauson Condensation (ii) Benzoin Condensation
8. Define and explain the following terms:
(i) Molar conductance (ii) Specific conductance
(iii) Equivalent conductance
9. (a) State and explain the necessary condition for a compound to exhibit optical isomerism.
(b) Discuss the optical isomerism exhibited by tartaric acid.
10. What do you understand by Kohlrausch law? What are applications of Kohlrausch law?



Nalanda Open University, Patna

*Programme of B.Sc. Part-II Chemistry (Hons.),
Practical Class and Practical Examination, 2017*

Venue:- 4th Floor, Chemistry Lab, Biscomaun Bhawan, Patna

(A) Practical Counselling Class

Date	Paper	Time	Roll No
16.03.2017	III & IV	11:30 AM to 5:30 PM	All Old Students & Roll No- (150470001 to 150470035)
17.03.2017	III & IV	11:30 AM to 5:30 PM	(150470036 to 150470091)

(B) Practical Examination

Date	Paper	Time	Roll No
21.03.2017	III & IV	11:30 AM to 5:45 PM	All Old Students & Roll No- (150470001 to 150470035)
23.03.2017	III & IV	11:30 AM to 5:45 PM	(150470036 to 150470091)

Nalanda Open University

Annual Examination - 2017

B.Sc. (Honours), Part-II

Paper - Chemistry (Subsidiary)

Time: 3.00 Hrs.

Full Marks: 80

Answer any Five questions. All questions carry equal marks.

- Choose correct answer from the following statements:-
 - Transition elements are:
 - s-block elements
 - p-block elements
 - d-block elements
 - None of these
 - Chromium has electronic configuration:
 - $Ar3d^4 4S^2$
 - $Ar 3d^5 4S^1$
 - $Ar 3d^6$
 - None of these
 - Which of the halogen acid does not give precipitates with $AgNO_3$ Solution
 - HCl
 - Hf
 - HBr
 - HI
 - Which of the following has the greatest affinity for haemoglobin
 - NO
 - CO
 - SO₂
 - NH₃
 - Which of the following is present in minimum in acid rain
 - CH₃COOH
 - H₂SO₄
 - HCl
 - $\begin{array}{c} CH_2COOH \\ | \\ CH_2COOH \end{array}$
 - The effective atomic number of nickel in the complex $Ni(CO)_2$ is
 - 28
 - 30
 - 32
 - 36
 - Electron affinity increasing order is as
 - $F < Cl < Br < I$
 - $F > Cl > Br > I$
 - $I < Br < F < Cl$
 - $I < Cl < Br < F$
 - All inert gases (Element) belong to
 - Zero group of P.T
 - 1st group of P.T
 - III group of P.T
 - IV group of P.T
- Why d-block element are called as transition metals. How do the following properties vary in a transition metal series.
 - atomic radius
 - density
 - m.p & b.p
- Write the I.U.P.A.C name of the following complex
 - $[CO(NH_3)_6]Cl_3$
 - $LiAlF_4$
 - $Ni(CO)_4$
 - $[Pt(NH_3)_2Cl_4]$
- What is water pollution? How are water pollutants classified? Discuss the various methods available for primary and secondary.
- Explain:-
 - Hg is liquid
 - TiO₂ is white where as TiCl₃ is violet
 - KmnO₄ is a good oxidizing agent
- What happen when
 - SiO₂ reacts with Hf
 - CO reacts with NaOH
 - Steam is passed over red hot iron
 - CO is passed over heated Ni at 80°C
- Describe two of the air pollutants in respect of its
 - Sources
 - Harmful effects of preventive measure
- What do you understand by Werner theory? What are its merit and weaknesses.
- What are the ores of Cobalt? How cobalt in pure state is obtained from its ore? Describe its oxidation states.
- Describe the principle involved in the determination of nickel ion in the solution gravimetrically.



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Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-III
Paper-V

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. (a) State and explain the following terms:-
 (i) Phase (ii) Component (iii) degree of freedom
 (b) Find the number of phases, number of Component's and degree of freedom in the following system.

$$\text{CaCO}_3(\text{S}) \rightleftharpoons \text{CaO}(\text{S}) + 2\text{CO}_2(\text{g})$$
2. (a) What do you mean by the 'void' in the crystal lattice? Explain the difference between tetrahedral void and Octrahedral void.
 (b) What do you mean by Co-ordination number of Constituents of a Crystal? Explain with example.
3. What do you mean by bravais Lattices? Explain the cubic system. How many particles are occupied by the unit cell of These Lattics?
4. State and explain Lambert-Ber law governing photochemical law of photochemical equivalence.
5. What is heterogenous Catalysis? State the theory of heterogenous Catalysis. Explain with examples the activity and selecting of heterogenous Catalysis.
6. State and explain phase rule and use it to discuss the phase diagram of sulphur system.
7. Using x-rays beam of known frequency (or known wavelength) deduce Brag's equation for the measurement of the interplanar-distancs in a Crystal.
8. What are the Postulates of Collision Theroy? Derive the expression for rate Constant in terms of a parameters of Collision theory.
 Given that the initial concentration of both reactants are different.
9. What is doping in crystal lattice? How does it work as semiconder? Explain the difference between n-type and p-type semiconduter.
10. Write notes on any **two** of following:-
 (a) Adsorption
 (b) Fluorescence and phosphorescence
 (c) Molar refractivity
 (d) Crystal deflect.



Programme of B.Sc. Part-III Chemistry (Hons.)
Annual Practical Counselling & Practical Examination - 2017

Venue : 4th Floor Biscomaun Bhawan, Patna - 800 001

Practical Counselling

Date	Time	Paper
23.02.2017 to 25.02.2017	11:30 AM to 3:30 PM	V to VIII

Practical Examination

Date	Time	
	11:30 AM to 2:30 PM	2:45 AM to 5:45 PM
27.02.2017	Paper-V	Paper-VI
28.02.2017	Paper-VII	Paper-VIII

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-III
Paper-VI

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. What are basic postulates of valence bond theory for the formation of Complex Compounds. Describe on the basis of this theory of complexes with suitable examples. What are the differences between inner and outer complexes ? What are limitations of this theory.
2. What are the important ores of Vanadium ? Give the details of extraction of pure vanadium from its ores. Explain the important oxidation state of vanadium.
3. What are Lanthanides ? Write down their electronic configuration. What do you mean by lanthanide contraction ? What are the consequences of Lanthanide contraction ?
4. Determine the magnetic susceptibility experimentally by Gouy method.
5. Explain the term: Probability and radial of an electron in an atom. Draw radial probability distribution curve for S and p-orbits.
6. Explain L-s coupling scheme. How would you derive the ground state term symbol ? Calculate free ion ground for Cr^{3+} , Cu^{++} , Fe^{++} and V^{3+} .
7. Why liquid Sulphur dioxide is a good non-aqueous solvent ? Explain the following type of reaction in liquid Sulphur dioxide with suitable examples :-
(a) Acid-Base reaction (b) Precipitation reaction (c) Solvolysis
8. What are important features of crystal field theory ? What do you mean by splitting of a d-orbitals ? How does the d-orbitals split in an octahedral crystal field ?
9. What do you mean by The dual nature of a particle ? Derive an expression for de-Broglie relationship. How was it verified.
10. Write down the notes on the following :-
(a) Point group
(b) Element of symmetry
(c) Symmetry operation



Programme of B.Sc. Part-III Chemistry (Hons.)
Annual Practical Counselling & Practical Examination - 2017

Venue : 4th Floor Biscamaun Bhawan, Patna - 800 001

Practical Counselling

Date	Time	Paper
23.02.2017 to 25.02.2017	11:30 AM to 3:30 PM	V to VIII

Practical Examination

Date	Time	
	11:30 AM to 2:30 PM	2:45 AM to 5:45 PM
27.02.2017	Paper-V	Paper-VI
28.02.2017	Paper-VII	Paper-VIII

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-III
Paper-VII

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. Explain the mechanism of hydroboration of alkene.
2. How the constitution of uric acid been determined ? also give synthetic evidence in favour of the accepted structure of uric acid.
3. (a) What are differences between SN_1 and SN_2 reaction
(b) Discuss the SN_2 reaction mechanism of substitution of alkyl halide.
4. Explain the following statement :-
(a) Cyclobutadiene is not an aromatic compound.
(b) Cyclopropenyl cation is aromatic but cyclopropenyl anion is not aromatic.
(c) Pyrrole is a weakly acidic where as pyridine is weakly basic.
(d) Methyl group in toluene is an activator.
5. How is pyridine prepared ? Is it is base and its basicity is greater than that of pyrrole ? Why the electrophilic substitution in pyridine occurs chiefly in position-3 ?
6. How was actual indigo obtained from plant ? Give two methods for its synthesis. Give its important uses.
7. How is zenthine prepared from uric acid ? How does ethene react with $KClO_3$ in presence of hydrochloric acid ? How is Xanthine Synthesised by Trambe's method.
8. Discuss the theory of orientation based on the stability of intermediate carbonium ion to interpret The ortho-para and meta directing influence if substituents already present in benzene ring.
9. (a) What is ment by anti-markovnikov i.e. kharssh peroxide effect.
(b) Explain in terms of inductive effect on acidity order as given below
 $ClCH_2 COOH > HCOOH > CH_3COOH$
10. Discuss the degradative and synthetic means for ascertaining the structure of isoflovanone. How is isoflovanone is related to flovanone ?



Programme of B.Sc. Part-III Chemistry (Hons.)
Annual Practical Counselling & Practical Examination - 2017

Venue : 4th Floor Biscomaun Bhawan, Patna - 800 001

Practical Counselling

Date	Time	Paper
23.02.2017 to 25.02.2017	11:30 AM to 3:30 PM	V to VIII

Practical Examination

Date	Time	
	11:30 AM to 2:30 PM	2:45 AM to 5:45 PM
27.02.2017	Paper-V	Paper-VI
28.02.2017	Paper-VII	Paper-VIII

Nalanda Open University
Annual Examination - 2017
B.Sc. Chemistry (Honours), Part-III
Paper-VIII

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. All questions carry equal marks.

1. What do you mean by electromagnetic spectrum? Discuss the basic principle of magnetic resonance spectroscopy.
2. List the different regions of the electromagnetic spectrum with (i) wave number range (ii) the wave length in \AA .
3. What is ment by Knocking? Why is ethylene bromide added when TEL is used an antiknock?
4. What is green house effect? How it is caused? What are the major gases causing it? What o the adverse of green house effect?
5. What are the composition of soil and which soil is essential for plant growth? Which micro and macro elements necessary for the growth of the plants.
6. What do you mean by rubber? Write the structure of recurring unit of natural rubber. What is Vulcanization of rubber? Mention its uses.
7. Write the difference between fertilizer and mannure. Write four characteristics of fertilizer. What is the process of production of urea from ammonia?
8. Discuss the following:-
(a) Chromosphere (b) Bathchromic shift
9. Give two methods of synthesis on any two of the following:-
(a) Polystyrene (b) Terylene (c) Teflon
10. How are water pollutants classified? Discuss the important characteristic of waste water. Discuss the various methods suitable for primary waste water treatment. What are major objectives of the secondary waste water treatments?

