MINUTES OF THE 3rd MEETING OF THE SENATE

26.05.2004

NATIONAL INSTITUTE OF TECHNOLOGY
(DEEMED UNIVERSITY)
KURUKSHETRA-136119
(HARYANA)

NATIONAL INSTITUTE OF TECHNOLOGY,
(DEEMED UNIVERSITY)
KURUKSHETRA-136119

Minutes of 3rd Meeting of Senate of National Institute of Technology, Kurukshetra held on 26.5.2004 at 11.00 AM in the Board Room of the Institute

The following members were present:-

1. Dr. S N Mahendra,
Director,
NIT, Kurukshetra.

2. Prof.C.V. Ramakrishnan,
Professor,
Department of Applied Mechanics,
Indian Institute of Technology,
New Delhi-110016.

3. Dr. N P Mehta,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.

4. Dr. Krishna Gopal,
Professor, Elect. Engg. Deptt.
and Dean (Planning & Development),
NIT, Kurukshetra.

5. Dr. R K Arora,
Professor,
Electrical Engineering Department,
NIT, Kurukshetra.

6. Dr. R K Bansal,
Professor,
Civil Engineering Department
NIT, Kurukshetra.

7. Dr. T K Garg,
Professor, Mech. Engg.Deptt.,
and PTSW,
NIT, Kurukshetra.

RK

8. Dr. M K Soni,
Professor,
Electrical Engineering Department,
NIT, Kurukshetra.

9. Dr. S P Jain,
Professor & Chairman,
Electrical Engineering Department,
NIT, Kurukshetra.

10. Dr. V K Arora,
Professor & Chairman,
Civil Engineering Department
&
Chief Warden,
NIT, Kurukshetra.

11. Dr. V K Sehgal,
Professor,
Civil Engineering Department,
NIT, Kurukshetra.

12. Dr. S K Sharma,
Professor & Chairman,
Mechanical Engineering Department,
NIT, Kurukshetra.

13. Dr. K C Goyal,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.

14. Dr. K B Singh,
Professor & Chairman,
Humanities Department,
NIT, Kurukshetra.

15. Dr. A Swarup,
Professor,
Electrical Engineering Department,
NIT, Kurukshetra.

16. Dr. S K Chakarvarti,
Professor,
Physics Department
and Dean (Academic),
NIT, Kurukshetra.

17. Dr. D V Singh,
Professor,
Mathematics Department,
NIT, Kurukshetra.

18. Dr. O P Vermani,
Assistant Professor & Chairman,
Chemistry Department,
NIT, Kurukshetra.

19. Dr. V K Aggarwal,
Assistant Professor & Chairman,
Mathematics Department,
NIT, Kurukshetra.

20. Prof. Umesh Ghanekar,
Asstt. Professor & Chairman,
Electronics & Communication Engineering Department,
NIT, Kurukshetra.

21. Prof. Brahamjit Singh,
Asstt. Professor & Chairman,
Computer Engineering Department,
NIT, Kurukshetra.

22. Dr. M.L. Matta,
Asstt. Professor & Chairman,
Physics Department,
NIT, Kurukshetra.

23. Sh. R.P. S. Lohchab,
Member-Secretary

The following members could not attend the meeting:-

1. Prof. S. Gupta,
Principal,
Nemi Chand College of Engineering,
Israna,
Distt. Panipat (Haryana).

2. Prof. Sameresh Kar,
(Retired Professor, IIT Kanpur),
House No. 501,
IIT Campus,
Kanpur-208016 (UP).

3. Er. V K Sachdeva,
Executive Director,
The Saraswati Sugar Mills,
Yamuna Nagar-135001. (Haryana).

4. Prof. K R Sharma,
(Former Prof. & Head, EE, IIT Kanpur),
Vice-President, Samtel Colour Ltd.,
Ghaziabad (UP).

5. Shri V K Raizada,
(Former Member Rly. Board),
Managing Director, IRWO,
58, Rail Vihar, Sector 33,
NOIDA (UP).

6. Dr. A K Bhatnagar,
Petrotech Chair Professor,
Department of Chemical Engineering,
Indian Institute of Technology,
Hauz Khas,
New Delhi-110016.

7. Dr. A K Gupta,
Professor,
Electronics & Communication Engg. Deptt.,
NIT, Kurukshetra.

8. Dr. K S Kasana,
Professor,
Mechanical Engineering Department,
NIT, Kurukshetra.

The following members communicated their regrets.

1. Dr. M.P. Kapoor,
'SHANTI NIKETAN'
H.No.11, Salaria Vihar,
Army Welfare Housing Organistion,
Radio Station Road,
P.O. Punjabi University,
Patiala-147002 (Punjab).

2. Er. Surya Kant,
Vice-President,
Tata Consultancy Services,
PTI Building, 5th Floor,
Parliament Street,
New Delhi-I.

Before the agenda items were taken up for discussion, Shri R P S Lohchab, Registrar & Member-Secretary of the Senate extended hearty welcome to the Director, Professor C.V. Ramakrishnan from IIT, Delhi and the faculty members. Then the Director & Chairman of the Senate addressed the House. The following decisions were taken:-

Item 3.1 To confirm the minutes of the 2nd meeting of the Senate of the Institute held on 29.11.2003.

The minutes of 2nd meeting of the Senate held on 29.11.2003 were confirmed.

Item 3.2 To note the action taken on the minutes of the 1st meeting of the Senate of National Institute of Technology, Kurukshetra held on 16.4.2003.

The Senate noted action taken on the minutes of the 1st meeting of the Senate held on 16.4.2003 as furnished in the agenda item.

Item 3.3 To note the action taken on the minutes of the 2nd meeting of the Senate of National Institute of Technology, Kurukshetra held on 29.11.2003.

The Senate noted action taken on the minutes of the 2nd meeting of the Senate held on 29.11.2003 as furnished in the agenda item.

Item 3.4 **To consider fixing the criteria for admissions to the M.Tech. Programmes.**

After detailed discussions, the Senate decided as under:-

i) For the Session 2004-05, the criterion for admission in M.Tech. may remain the same as was last year. The admission may be made giving weightage to GATE score and the qualifying examination in the ratio of 70:30. The admission of the sponsored category candidates may be made on the basis of B.Tech./B.E./other qualifying examination as per existing pattern.

ii) The M.Tech. admission notification for the session 2004-05 may be released as early as possible.

iii) For M.Tech. admission during the year 2005 onwards, a core committee consisting of all Chairmen of the Departments may recommend the detailed criteria/procedure to decide the mode of weightage(s) and criteria for sponsored category candidates. The senior most Chairman amongst the Chairmen of Departments may chair the said meeting.

Item 3.5 **To consider prescribing cut-off date for receiving applications for Ph.D. registration.**

After detailed discussions, the Senate decided as under:-

i) The notification for admission of Ph.D. scholars may be released twice in the year i.e. in the even semester and the odd semester.

ii) The cut off dates for receiving applications i.e. 31st August for July-December (Odd) semester and 31st January for January-May (Even) semester were approved.

iii) The Departments may, however, accept applications not received in response to the advertisement or after the prescribed date for consideration.

iv) The applications based on recommendations of DRC and BOS may be sent by the Departments to Academic Section for enrolment. However, the fee for full semester shall be payable by the candidate as and when he/she is finally registered during the semester. For subsequent semesters, the scholar will pay the renewal fee on normal dates prescribed for UG & PG students.

Item 3.6 To consider permitting change of Branch to B.Tech. students in 3rd Semester.

The Senate approved the proposal for change of branch at the beginning of 2nd year of B.Tech. provided the number of students in a branch does not fall below 75% of the sanctioned strength and the vacancies exist in the branch to which transfer is sought.

Item 3.7 To consider fees and amounts payable by the Ph.D. scholars.

The Senate authorized the Director to constitute a committee which shall recommend the detailed fee structure for Ph.D. scholars in the following categories:-

i) a) Regular and full time scholars.
b) Part-time scholars from outside NITK.
c) Part-time scholars from NITK

ii) NRIs

Further the Senate authorized the Director to place the recommendations of the said committee before the Board for approval with his recommendations.

Item 3.8 To note the award of Shyam Sunder Dhingra Medal alongwith cash prize of Rs. 5000 w.e.f. the year 2003 onwards to the overall topper of the batch.

The Senate noted the award of Shyam Sunder Dhingra Medal alongwith cash prize of Rs. 5000/- from the year 2003 onwards to the overall topper of the batch.

The Senate decided that henceforth, Shyam Sunder Dhingra medal alongwith cash prize of Rs. 5000/- be given to the overall academic topper of the batch, out of the interest to be earned from the funds contributed by the batchmates of late Shri Shyam Sunder Dhingra as intimated by Shri Ankur Gupta, IAS, one of his batchmates.

Item 3.9 To note the registration of Ph.D. Scholars.

The Senate noted the registration of the Ph.D. scholars as per details furnished in the agenda item. The Senate suggested that the notification required to be issued by the Academic Section should indicate (a) cut-off date for payment of semester fees and registration/enrollment and (b) name(s) of supervisor/co-supervisor(s) of the scholar.

Item 3.10 To note the Academic Regulations regarding convocation and use of costumes/robes.

The Senate approved the amended Academic Regulations regarding the costumes/robes required to be used during convocations as per details furnished in the agenda item and as per Annexure-I enclosed herewith.

Item 3.11 To consider the Syllabi of B.Tech. 1st and 2nd Semester (common to all branches) for the Chemistry Department from the Academic Session 2004-05 onwards.

The Senate approved the syllabi of B.Tech. 1st Semester (CHT-105 & CHT-107) and 2nd Semester (CHT-106 & CHT-108) offered by Chemistry Department to be effective from the session 2004-05 onwards as proposed by Chairman of the Chemistry Department as per details furnished in the agenda item and as per Annexure-II enclosed herewith.

Item 3.12 To consider Panel of Examiners for evaluation of Ph.D. Thesis.

The Senate considered the proposal of Dr. R.K. Arora, Professor of Electrical Engineering Department and decided as under:-

i) The BOS of the Departments should prepare one panel of external examiners for Ph.D. Theses which will also include experts from abroad.

ii) It should be mandatory for Ph.D. scholars to publish atleast two papers in refereed national/international journals.

Item 3.13 To note the observation of the Board made in its 4th meeting held on 8.12.2003 on the minutes of the 2nd meeting of the Senate held on 29.11.2003.

The Senate noted the observations made by the Board in its 4th meeting held on 8.12.2003 while considering minutes of the 2nd meeting of the Senate held on 29.11.2003.

As regards Board's observations as indicated at paras (iii), (iv) and (ix), the same are already being implemented. The Board's observations indicated in paras (i), (ii) have been noted for compliance. As regards observations at para (viii), the matter have been referred to Sh. Dharam Vir, IAS, Financial Commissioner & Principal Secretary to Govt. of Haryana, Deptt. of Technical Education, Haryana, Chandigarh and reply is awaited.

The Senate constituted a committee of the following to examine the issues contained in the observations of the Board made in paras (v),(vi),(vii) of the Senate agenda item:-

1. Dr. Krishan Gopal, Dean(P&D), NITK	Chairman
2. Dr. S.K. Chakarvarti, Dean(Academic), NITK	Member
3. Dr. C.V. Ramakrishnan, Deptt. of Applied Mathematics, IIT, Delhi	Member
4. All Chairmen of the Deptts. NITK	Members

The Senate desired that the said committee may be requested to submit its report at the earliest possible.

The meeting ended with a vote of thanks to the Chair.

RPS Lohchab

(R P S Lohchab)
Registrar & Member Secretary

ANNEXURE-I

NATIONAL INSTITUTE OF TECHNOLOGY
KURUKSHETRA-136119

Academic Regulations regarding convocation and use of costumes/robes.

Existing Rules	Proposed Amendments approved by the Senate
2. ACADEMIC COSTUMES/ROBES	**1. ACADEMIC COSTUMES/ROBES**
(i)In these Regulations 'Ordinary' Academic Costume includes a black cap and gown without hood or sash and 'Full' Academic Costume, which includes in addition a hood or sash.	(iv) No Change
(ii) Members of the Senate and Board of Governors of the Institute and all those persons who will be receiving their degrees shall wear their Full Academic Costumes in Convocation of the Institute.	(v) No Change
(iii)The Chief Guest, Officers and Graduates of the Institute are entitled to wear Academic Costumes as follows: -	(vi) No Change
(A) CHIEF GUEST'S GOWN	**(A) CHIEF GUEST'S GOWN**
Superior Maroon Velvet with 4 inches Golden Lace on front folds bottom of sleeves. On shoulders with zari work fronts and tufts and zari work on the sleeves with tufts, without Monogram, Cambridge style, fully interlined special padding and material. Special Academic Cap of Superior Maroon Velvet with 1 inch Golden Lace and with Golden Tassel, Mortar band and with special material.	Superior Maroon Velvet with 4 inches Golden Lace on front folds bottom of sleeves. On shoulders with zari work fronts and tufts and zari work on the sleeves with tufts, without Monogram, Cambridge style, fully interlined. Special Academic Cap of Superior Maroon Velvet with 1 inch Golden Lace and with Golden Tassel, Mortar band.
(B) CHAIRMAN'S GOWN	**(B) CHAIRMAN'S GOWN**
Pure silk, hand woven, hand spun in Maroon colour with the Golden Lace on	Pure silk in Maroon colour with the Golden Lace on the front folds, bottom of

the front folds, bottom of sleeves, with ½ inch strip of green silk on the front folds and 3 strips on the sleeves in green silk. Oxford style, with two Institute Monograms, if available, fully interlined and with special padding and material. Cap of superior silk, hand woven, hand spun, with 1 inch Golden Lace. Mortar band with Golden Tassel. Sash: Pure Silk, Hand Woven, Hand spun in Maroon Colour, Golden Lace on the bottom and with Golden Jhaller.	sleeves, with ½ inch strip of green silk on the front folds and 3 strips on the sleeves in green silk. Oxford style, with two Institute Monograms, Cap of superior silk, with 1 inch Golden Lace. Mortar band with Golden Tassel. Sash: Pure Silk in Maroon colour, Golden Lace on the bottom and with Golden Jhaller.
(C) DIRECTOR'S GOWN Maroon silk with 2 inches Golden Lace on the front folds round neck and on bottom of sleeves, with two strips of ½ inch wide green silk on the front folds and 3 strips ½ inch width of green silk the sleeves with two Institute Monograms, if available, in Golden zari work the fronts with hand made fluting; Oxford style, fully interlined with special padding and material. Academic cap of pure silk Maroon colour with 1 inch Golden Lace. Mortar band with Golden Tassel. Sash: Pure Silk, Hand Woven, Hand spun in Maroon Colour, Golden Lace on the bottom and with Golden Jhaller.	**(C) DIRECTOR'S GOWN** Maroon silk with 2 inches Golden Lace on the front folds round neck and on bottom of sleeves, with two strips of ½ inch wide green silk on the front folds and 3 strips ½ inch width of green silk the sleeves with two Institute Monograms, if available, in Golden zari work the fronts. Oxford style, fully interlined with special padding and material. Academic cap of pure silk Maroon colour with 1 inch Golden Lace. Mortar band with Golden Tassel. Sash: Pure Silk, Hand pun in Maroon Colour, Golden Lace on the bottom and with Golden Jhaller.
(D) REGISTRAR'S GOWN Black Heavy silk with 2 inch silver lace on the front folds round the neck and on the bottom of the sleeves, bottom of the sleeves with ½ inch wide of green silk on the front folds and two strips ½ inch wide of green silk on the sleeves with two Monograms in silver zari work with hand made fluting with Institute Monograms, if available, in silver zari work with hand made fluting with special padding and material. Cap of black Velvet Mortar band ½ inch lace and Material.	**(D) REGISTRAR'S GOWN** Black Heavy silk with 2 inch silver lace on the front folds round the neck and on the bottom of the sleeves, bottom of the sleeves with ½ inch wide of green silk on the front folds and two strips ½ inch wide of green silk on the sleeves with two Monograms in silver zari work with hand made fluting with Institute Monograms, if available, in silver zari work. Cap of black Velvet Mortar band ½ inch lace and Material.

SENATE MEMBERS GOWN	SENATE MEMBERS GOWN
Superior silk in Golden Yellow Colour with lacing of 3 inches Green Silk on front folds and with strips of green silk 1 inch whole on the sleeves with one Institute Monogram, if available, on the left front with hand made fluting. Oxford style and with special padding and material. For PhDs Pure Red silk will be used. Caps of superior Golden Yellow Velvet, Mortar band with 1 inch wide green silk border with Golden silk Tassel. For PhDs Red Velvet will be used.	Superior silk in Golden Yellow Colour with lacing of 3 inches Green Silk on front folds and with strips of green silk 1 inch whole on the sleeves with one Institute Monogram, if available, on the left front with hand made fluting. Oxford style. For PhDs Pure Red silk will be used. Caps of superior Golden Yellow Velvet, Mortar band with 1 inch wide green silk border with Golden silk Tassel. For PhDs Red Velvet will be used.

B.Tech. Ist Semester(Common to all branches) ANNEXURE-II
CHT-105 Chemistry-I
(2004-05 on wards)

L	T
3	1

Class tests	:	40 marks
Teacher's assessment	:	10 marks
End Sem. Exam.	:	50 marks
Time	:	3 hrs.

1. **Chemical Equilibrium:** pH, buffer solutions and salt hydrolysis. **03**

2. **Chemical Kinetics:** Second order reactions, derivation of velocity constant with same and different concentrations of the reactants, half life period, basic concepts of complex reactions, Collision theory & absolute reaction rate theory.. **04 L**

3. **Electrochemistry including Corrosion**: Half-reaction concept, reversible cells, galvanic cells, concentration cells. Theories of corrosion, types of corrosion(water-line corrosion, stress corrosion, pitting corrosions, microbiological corrosion). Factors affecting the rate of corrosion and corrosion control (design, cathodic protection, modification of environment, protective coatings) **08 L**

4. **Photochemistry:** Photochemical and dark reactions, laws of photochemistry, quantum efficiency, classification of photochemical reactions on the basis of their quantum efficiencies. Non-radiative processes (isc & ic), fluorescence, phosphorescence (Jablonski diagram), chemiluminiscence, photosensitization, technology based on photochemical processes. **06 L**

5. **Phase Rule:** Description of various terms(phase, component and degrees of freedom). One component system(water system), freeze drying. Two components system with simple eutectic formation(Pb-Ag and KI-H_2O systems), solders, safety plugs, freezing mixtures. **05L**

6. **Organic Chemistry & Polymers:** Covalent bond cleavage(homolytic and heterolytic), reaction intermediates(carbocations, carbanions, carbenes and free radicals).

Organic polymers-types and mechanism of polymerisation(free radical, anionic, cationic and coordination), thermoplastic(low and high density polythenes, PMMA) and thermosetting resins(bakelite, epoxy).
Inorganic polymers-preparation, properties and uses of silicones. **09 L**

7. **Transition Elements and Coordination Chemistry:** General characteristics of transition elements, coordination compounds, introduction to various theories of bonding, applications of coordination compounds. **04 L**

8. **Water:** Demineralization, desalination, formation of deposits in boilers, scale and sludge formation: their composition, properties and methods of prevention. **05 L**

9. **Spectroscopy:** Introduction (excluding instrumentation) and applications-UV-visible, IR and NMR spectroscopy. **04 L**

Total: 48 L

Books Recommended:

1. Physical Chemistry, P.W. Atkins.
2. Principles of Physical Chemistry, B.R.Puri, L.R.Sharma & M S Pathania.
3. Organic Chemistry, Morrison and Boyd.
4. Reactions Mechanism in Organic Chemistry, S.M.Mukherji & S.P.Singh.
5. Inorganic Chemistry, J.D. Lee.
6. Principles of Inorganic Chemistry, B.R.Puri, L.R.Sharma & K.C.Kalia.
7. Spectrometric Identification of Organic Compounds, R.M.Silverstein, G.C,Bassler and T.C,Morrill..
8. Chemistry in Engg.& Tech. Raja Ram & J.C.Kuriacose.
9. Engineering Chemistry, Jain & Jain.

Note for Paper-setter: *Eight* questions should be set in all. The students should be asked to attempt any *five* questions.

B.Tech. Ist Semester(Common to all branches)
CHT-107 Chemistry-I Practical
(2004-05 on wards)

L	T	P
-	-	2

Mid Sem. Evaluation	: 15 marks
Teacher's assessment	: 15 marks
End Sem. Exam.	: 20 marks
Total	: 50 marks
Time	: 3 hrs.

S.No. **List of Experiments**

1. Determination of total hardness of water by EDTA titration.
2. Determination of temporary and permanent hardness by water by EDTA titration.
3. Determination of calcium and magnesium hardness of water separately by EDTA titration.
4. Determination of copper in copper alloy/ore solution.
5. Determination of ferrous and ferric iron present in the given ore solution with $K_2Cr_2O_7$ using external indicator method.
6. Determination of ferrous and ferric iron in given ore solution with $K_2Cr_2O_7$ using internal indicator method.
7. Determination of total iron in a solution of iron ore by $KMnO_4$ method.
8. Determination of calcium as calcium oxide volumetrically in cement.
9. Determination of the available chlorine in bleaching powder suspension and to find out the chlorine demand of the given water sample.
10. Analysis of coal for moisture and ash contents.
11. Determination of ion exchange capacity of a given cation exchanger/anion exchanger.
12. Determination of mangenese dioxide in pyrolusite.
13. Determination of the composition of a liquid mixture by surface tension method using Stalagmometer.
14. (i) Conductometric determination of hydrochloric acid with standard NaOH.
    (ii) Conductometric determination of acetic acid with standard NaOH.
15. Conductometric determination of the composition of a mixture of acetic acid and hydrochloric acid with standard NaOH.

B.Tech. 2nd Semester
(Common to all branches)
CHT-106 Chemistry-II
(2004-05 on wards)

L	T
2	1

Class tests : 40 marks
Teacher's assessment : 10 marks
End Sem. Exam. : 50 marks
Time : 3 hrs.

1. **Biomolecules:** Elementary knowledge of Enzymes and coenzymes, Carbohydrates, Proteins, Lipids and their biodegradation. **05 L**

2. **Environmental Chemistry:** Segments of Environment, Earth's radiation balance, horizontal and vertical dispersion of pollutants, temperature inversion, Green House Effect, Acid Rains, Ozone Layer, Photochemical Smog, Bhopal gas release accident. **05 L**
D.O., B.O.D.,C.O.D. and their significance, surface water pollution and self purification, Waste water treatment-Sedimentation & Biological Methods. **07 L**

3. **Coal:** Proximate and ultimate analysis, liquification and gassification. **03 L**

4. **Petrochemicals**: Sources of petrochemicals, CNG. Basic building block processes-thermal cracking(mechanism, production of ethylene and co-products, petrochemicals from ethylene and propylene) and catalytic reforming(mechanism, production of BTX aromatics), petrochemicals from BTX aromatics. **06 L**

5. **Lubricants:** Principle and mechanism of lubrication, dewaxing of oil fraction. acid and solvent refining, properties of refined oils(viscosity, viscosity index, acic value, saponification value, iodine value, pour point, cloud point, aniline point) and thei determination, lubricating greases and their penetration and drop point tests, solic lubricating greases and their penetration and drop point tests, solid lubricants, thei structure and uses. **06 L**

Total: 32 l

Books Recommended:

1. Chemistry for Environmental Engineering, Sawyer & McCarty.
2. Chemistry in Engg.& Tech. Raja Ram & J.C.Kuriascose.
3. Environmental Chemistry, A.K.De.
4. Applied Chemistry, Theory and Practice, O.P.Vermani & A.K.Narula.
5. Introduction to Petrochemicals, Sukumar Maiti.
6. Engineering Chemistry, Jain & Jain.
7. Petrochemicals, Peterwiseman.

Note for Paper-setter: *Eight* questions should be set in all. The students should be asked to attempt any *five* questions.

B.Tech. 2nd Semester(Common to all branches)
CHT-108 Chemistry-II Practical
(2004-05 on wards)

L	T	P
-	-	2

Mid Sem. Evaluation	: 15 marks
Teacher's assessment	: 15 marks
End Sem. Exam.	: 20 marks
Total	: 50 marks
Time	: 3 hrs.

S.No. **List of Experiments**

1. Determination of Alkalinity of Irrigation water.
2. Determination of Nitrite in KNO2/NaNO2.
3. Determination of D.O. in the given sample of water.
4. Determination of C.O.D. of a waste water. Absorption of Oxalic acid on charcoal.
5. Determination of percentage of acetic acid in vinegar sample/Analysis of antacic tablets.
6. Preparation of phenol-HCHO resin. Cellulose-acetate resin/urea-HCHO resin.
7. Determination of acid value of an oil.
8. Determination of iodine value of an oil.
9. Determination of saponification value of an oil.
10. Determination of saponification value of an oil.
11. Determination of flash point by Abel's flash point apparatus and Pensky Marten's apparatus.
12. Determination of viscosity of Lubricants by Redwood Viscometers.
13. Determination of the amount of combined and free chlorine residuals present in the given sample of water.
14. Spectrophotometric determination of cobalt chloride & verification of Lamberts-Beer's law.
15. (i) Acrolein test for glycerol.
    (ii)Test for unsaturation of fatty acids in lipid sample.
16. Identification of the nature of carbohydrates in a given sample.