
UNIVERSITY OF MYSORE
DEPARTMENT OF SUGAR TECHNOLOGY
SIR M V VISVESVARAYA P G CENTRE, MANDYA

No.VPGCM/ST/86 /2021-22

Date: 23-11-2022

From
Dr. K.S Venkatesh
Professor & Chairman,
BOS in Sugar Technology

To
The Members of BOS in Sugar Tech
University of Mysore, Mysuru

Sir

Sub: Conduct of BOS Meeting in Sugar Technology
Ref: UA2/379/2013-2014 Date 15-11-2021

Handwritten signature and date:
26/11/2021

With reference to the above, the meeting of Board of Studies in Sugar Technology is convened on 25-11-2021 at 11am at Academic Council (AC) Hall, Crawford Bhavana, University of Mysore, Mysuru. Please make it convenient to attend the same positively and applicable allowances will be provided as per the University norms. Kindly peruse the following agenda and offer your valuable remarks & suggestions.


1. To adopt National Level Admission Process to M.Sc Sugar Technology independent from the Common P.G Admissions of the University similar to M.Sc. Bio-Technology.
2. To conduct the Karnataka State Eligibility Test (KSET) for Sugar Technology
3. To include Weekly & Monthly Factory Visits / Industrial Tour for M.Sc. Sugar Technology Students as a part of the curriculum for 4 Credits
4. Pattern of Examination for Add-on Proficiency Diploma (18 Credit)
Part - A (14 Credits)
 - a) C1, C2, C3 - Based on In-Plant Training Weekly Reports, & C4 - Written Examination - 100 Marks
 - b) In-plant Training Report - 100 Marks.
 - c) Viva/voce Examination - 100 Marks.**Part - B (4 Credits)**
 - a) Factory Visit/Industrial Tour Report - 100 Marks

5. Provision of the 'In-Plant Training' in a single phase of 3 or 4 months instead of two phases of 2 months each depending upon the Factory Working under special circumstances (e.g., Covid-19).
6. Revision and Approval of Panel of Examiners for the year 2021-22
7. Any other matter with permission of the chair.

Looking forward to your participation in the meeting and fruitful deliberations

Thanking you

yours sincerely


CHAIRMAN 3/11
BOS in Sugar Technology
University of Mysore
Sir. M. Vishvesvaraya P.G. Centre
Mandya - 571402

Copy to

1. The Registrar, University of Mysore, Mysuru for kind information and needful

Proceedings of the BOS Meeting in Sugar Technology

The members of the Board of Studies in Sugar Technology met on 25th November 2021, at Crawford Hall, University of Mysore, Mysuru and resolved the following decisions unanimously:

Agenda 1: *To adopt National Level Admission Process to M.Sc Sugar Technology independent from the Common P.G Admissions of the University similar to M.Sc. Biotechnology.*

Resolution: The admission process to M.Sc. Sugar Technology shall be made at the National level (Independently from the common P.G admission process of the University) by giving a separate notification vide advertisement in the national news papers and other media. The number of seats can be increased to 40 (Scheme A) out of which 20 seats maybe earmarked for the students of University of Mysore and other Universities within Karnataka. The remaining seats may be filled with students of Universities outside Karnataka. This proposal may be worked out as per the norms of the university similar to that of M.Sc Bio-Technology course.

Agenda 2: *To conduct the Karnataka State Eligibility Test (KSET) for Sugar Technology*

Resolution: The KSET Examination should be conducted for the M.Sc Sugar Technology Post Graduates to meet the Teaching Faculty requirements of various colleges & institutes and also as eligibility to pursue Ph.D research.

Agenda 3: *To include Weekly & Monthly Factory Visits / Industrial Tour for M.Sc. Sugar Technology Students as a part of the curriculum for 4 Credits*

Resolution: To supplement the theoretical knowledge the students should be taken for sugar factory visits / Industrial Tour for better understanding of Sugar Manufacture. The Tour Report shall be valued for 4 Credits.

Agenda 4: *The following pattern of examination for Add-on Proficiency Diploma (18 Credit) is approved*

Part - A (14 Credits)

- a) C1, C2, C3 - Based on In-Plant Training Weekly Reports, & C4 - Written Examination - 100 Marks
- b) In-plant Training Report - 100 Marks.
- c) Viva/voce Examination - 100 Marks.

Part - B (4 Credits)

- a) Factory Visit/Industrial Tour Report - 100 Marks

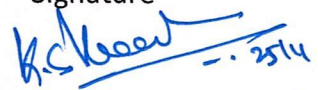




Agenda 5: *Provision of the 'In-Plant Training' in a single phase of 3 or 4 months instead of two phases of 2 months each depending upon the Factory Working under special circumstances (e.g., Covid-19).*


Resolution: Approved to facilitate in-plant training of students during sugarcane crushing season

Agenda 6: Revised Panel of Examiners is approved for the year 2021-22

Agenda 7: Approval of Syllabus for the Open Elective Course
" Sugarcane Agriculture" (LTP : 4:0:0)

Resolutions: Syllabus is approved

Name	<u>Members Present</u>	Signature
1. Dr. K.S.Venkatesh	Chairman	 25/11/21
2. Dr. Mahadevaiah,	Member	 25/11/21
3. Dr. M.P. Manohar	Member	 M.P.
4. Dr. M A Harish Nayaka	Member	 Harish Nayaka 25/11/2021
5. Prof. K Kemparaju	Member	 Kemparaju
6. Prof. Manohar.B.	Member	— Absent —
7. Prof. K N Mohana	Member	 K N Mohana 25/11/2021
8. Dr. Poornima Hiremath	Member	— Absent —
9. Prof. K Siddappa	Member	— Absent —

 25/11/21
(Dr.K.S.Venkatesh)

Dr. K. S. VENKATESH, M.Sc., Ph.D.,
Professor
Dept. of Studies & Research in Sugar Technology
University of Mysore
Sir M. Visveswaraya Post Graduate Centre
Tubinakere, Mandya-571 402

**DEPARTMENT OF SUGAR TECHNOLOGY
PANEL OF EXAMINERS - 2021-2022**

Internal Examiners

1. Dr. K. S. Venkatesh, Dept of Sugar Technology, P G Centre, Mandya
2. Dr. Mahadevaiah , Dept of Sugar Technology, P G Centre, Mandya
3. Dr. Manohar M. P, Dept of Sugar Technology, P G Centre, Mandya
4. Dr. Harish Nayaka M. A, Dept of Sugar Technology, P G Centre, Mandya

External Examiners

Chemistry

1. Dr.R. L. Jagadish, P G Centre, Mandya
2. Dr. T. Demappa, P G Centre, Mandya
3. Prof. K. Vasanthkumar Pai, Dept of Industrial Chemistry, Kuvempu University, Shankaraghatta, Shimoga
4. Dr. B.E. Kumaraswamy, Dept of Industrial Chemistry, Kuvempu University, Shankaraghatta, Shimoga
5. Dr. G. K. Nagaraja, Dept of Chemistry, Mangalore University, Mangalore
6. Prof. J.Keshavaiah, Dept of Chemistry, Kuvempu University, Shankaraghatta, Shimoga
7. Dr.Y.D.Bhodike, Dept. of Industrial Chemistry, Kuvempu University, B.R. Project, Shankaraghatta, Shimoga
8. Dr.Suresh Kumar, Dept. of Biochemistry, Principal Scientist, CFTRI, Mysuru.

9. *Dr. Harish prashantha, Dept. of Bio Chemistry, Principal Scientist, CFTRI, Mysuru.*

Sugar Technology

1. B .V. Nagaraju, Dy. Manger Process, NSL Sugars Ltd., Maddur Tq, Mandya
2. Manjunatha .C., Manger Process, NSL Sugars Ltd.,Maddur
3. Puneeth Kumar K.T, Manager, Novozymes Pvt Ltd, Bangalore.
4. Shiva Kumar D C, Manager , Kimberlite Pvt Ltd, Bangalore
5. Amarendra B N, Asst. Manger, CSL, Makavalli, K.R.Pet.
6. Harisha. B. N., GM,(Process), Nirani Sugar, Pandvapura (PSSK)
7. Purushottam, Bannari, Amman Sugars Ltd, Kuntur, Kollegal, Chamarajanagar
8. Dinesh Sharma, Godavari Biorefineries Ltd, Sameerwadi, Mudhol, Bagalkot
9. Binod Kumar S, Jam Sugars Limited, Kundaragi Village, Bilagi Taluku, Belagum District.
10. Sri Kotta Venugopal, manager (Process), EID Parry Ind Ltd, Haliyal, UK Dist.
11. Sri Shankaralingaiah, Manager Process, SCSLtd., K.M Doddi
12. Lokesh H G., Sr.Mfg Chemist, NSL Sugars Ltd.,Koppa, Maddur
13. Mr.Sreenivasa,Sr.Mfg Chemist,NSL Sugars Ltd., Koppa, Maddur
14. Lingaraju., Sr.Mfg Chemist, NSL Sugars Ltd., Koppa, Maddur
15. Narayana. N. A, Asst. Manager, CSL Sugars Ltd., K R Pet
16. Mahesh, DGM (Process), ICP Ltd., Uttur, Mudhol tq., Bagalkot Dist
17. Dr.K.B.Chandrashekar, Dept of Sugar Technology, P G Centre, Mandya.
18. Prakash Chandaragi, EID Parry Haliyal.
19. Mahaveer MoleAjit, Asst Manager(Process), Ugar Sugars Ltd, Ugar, Belagum Dist

Sugar Engineering

1. Dr Ravindra Gabadi, P.G.Centre, Gulbarga University, Bidar.
2. Dhananju, Asst Manager, CSL, Makavalli, K R Pet, Mandya
3. M Mohan, ITC Infotech India Limited, ITC Infotech Park, #18, Banaswadi Main Road
4. Ravi M, DGM(Engineering),SCS Ltd., K M Doddi
5. Dharmesh G L, AGM Eng., BASL - Unit 1, Alganchi, Nanjanagud
6. Purushottam M P, DGM Eng.,NSL Sugars, Koppa

Sugarcane Agriculture

1. Dr. K.M Harinikumar, Agricultuaral University GKVK, Bangalore.
2. Dr. Swamy, Dept. of Plant Breeding and Genetics, GKVK, Bangalore.
3. Dr. Niranan Murthy, ZARS V.C Farm, Mandya.
4. Dr. S.N Swamy Gowda, ZARS V.C Farm, Mandya.
5. Dr Thimmegowda, Agronomist, ZARS, VC Farm Mandya
6. Sri Baburaj, AGM, Cane, CSL K R Pet, Mandya
7. Dr. Keshavaiah, Sugarcane Agriculture, ZARS V.C Farm, Mandya.
8. Dr Yogananda, Senior forum Supt, ZARS V.C Farm, Mandya.
9. Dr.K.T. Pandurangegowda, Asst. Director, ZARS, V.C. Farm, Mandya
10. Dr.M.S.Uma, ZARS, GKVK, Bengaluru
11. Kempaegowda, DGM Cane, SCS Ltd., K M Doddi
12. Dr.R.B.Khandagave, Director, S.Nijalingappa Sugar Institute, CTS.No.4125/1B, Laxmi Tek, Ganeshpur Road, Belagavi - 590 009
13. Prof. Umesh Dept of Bio-Techonology MGM, UOM ,Mysore.
14. Geeta Nagaraju, Dept of Bio-Techonology MGM, UOM, Mysore.
15. Dr.Amruthesh, Dept of Botany, MGM, UOM, Mysore
16. Dr. Sathish, Dept of Microbiology, MGM.UOM.Mysore.
17. Dr. Srinivas . Dept of Microbiology, MGM.UOM.Mysore.
18. Prof. Shubha Gopal, Dept of Microbiology, MGM.UOM.Mysore.

Statistics


1. Dr. S.Ravi, Dept of Statistics, MGM
2. Dr.D.D Somashekhar, Dept of Mathematics, MGM
3. Prof. Yogesh, Dept. of Economics, Kuvempu University, B.R. Project, Shankaraghatta, Shimoga

Management

1. Dr Anand, BIMS, MGM
2. Prof. J.Madegowda, Chairman, Dept. of Commerce, Kuvempu University, B.R. Project, Shankaraghatta, Shimoga
3. Dr. Bheemanagowda, Dept. of Commerce, Kuvempu University, B.R. Project, Shankaraghatta, Shimoga
4. Dr. Aiesha Sharif, BIMS, MGM, UOM, Mysosre.
5. Dr. M.L.Ashok. Dept of Commerce, MGM, UOM, Mysore

Chemical Engineering

1. Dr. Umesh Hebbar, Chief Scientist, Dept of Food Engineering, CFTRI, Mysore
2. G.R. Suma, Dept of Chemical Engineering, SIT Tumkur
3. Harish Phattepur, Dept of Chemical Engineering, SIT Tumkur
4. P.L. Muralidhar, Dept of Chem Eng, RVCE, Bangalore – 59
5. Vidya. C., Dept of Chem Eng, RVCE, Bangalore – 59
6. Dr. Madhu, Dept. Of Chemical Eng, MSRIT, Bengaluru
7. Dr. Rastogi. N.K., Chief Scientist Food Engineering Department, CFTRI, Mysuru.


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UNIVERSITY OF MYSORE
DEPARTMENT OF SUGAR TECHNOLOGY
SIR M.V.POST GRADUATE CENTER, TUBINAKERE, MANDYA

Syllabus of

Add on Proficiency Diploma (18 Credits)

Title of the Soft Core In-Plant Training

General Instructions

1. On the first day, visit all the departments, introduce yourself and narrate the purpose of your visit to the heads of departments.
2. Every morning from 6AM to 8PM spend with Lab-in-Charge, observe stock taking and daily manufacturing report (DMR) preparation. Maintain a calculation book.
3. Follow the preparation of 'weekly and monthly manufacturing report'
4. Spare 1-2 hr daily for carrying out laboratory analysis.
5. You should be able to operate each equipment on your own (Hands on training)
6. Record all your observations in a book
7. As and when required refer to equipment drawings if available
8. On cleaning day, observe how the process is closed and different materials are preserved. Learn how the cleaning and maintenance jobs are executed.
9. Record the pipe line diameter, motor HP, reduction gear type and ratio, pump details at every station.
10. Observe the amperes load taken by each motor.
11. Collect RT-7C (for the current season), RT-8C (current & previous) and Form I(1)
12. This is a very good opportunity so, learn as much as possible. Spend minimum 12-14hrs daily inside the plant.
13. A report on inplant training should be submitted within 15 days of completion of training. A viva/voce will be conducted on training.
14. Period of stay in each section can be adjusted as per the available crushing period

Work Schedule

1. MILLS, BOILER & POWER HOUSE

- 3 week

Weigh Bridge: Learn cane weighing and calibration of weigh bridge, meet weigh bridge supervisor. Cane Carrier, Feeder Table & Un-loader: Learn operation, note the technical details (Length, slots, drive motor etc). Preparatory Devices: Name, Make, RPM, Weight of Hammers, rpm, clearance, motor specifications etc. Note the Preparatory index for 1 week. Technical details of Pressure feeders (TRPF, GRPF or Underfeed Roller), Donnelly Chutes, Inter Carriers.

Mills: Make, Type, Size of First mill and other mills. Pitch, Depth, Angle of roller grooves of all mills, hydraulic load applied on each mill, rpm of mills. Mill drive (Details of the drive system), Gear Details, Coupling Type. Record rpm, hydraulic load, electricity consumption, imbibitions water flow rate every hour for 7 days. Note Moisture% Bagasse every shift.

Collect the mill setting Calculations, Brix Curves and discuss with Mill Engineer. Juice pumps, Juice Screening (Working & Technical details of Rotary Screen), Juice Flow Meter (Operation, Cleaning & Maintenance). Problems in Milling, Mill stoppages and reasons, Every shift observe the mill Log Book and note the remarks. Staffing pattern (Fitters, Helpers, Khalasis etc). Off seasonal Maintenance.

BOILER:

Working of Boiler, Blowdown, Furnace Cleaning – Feed water treatment Demineralization plant, Make up water, Feed pumps – R.B.C – flue gas heat recovery systems viz., Economiser, Air pre heater – secondary air (SA) fan, Forced draft (FD) fan, Induced Draft (ID) fan, chimney, dust collectors, Boiler instrumentation.

Slow firing, rising the pressure, pressure maintenance – low boiler pressure, back feeding – water high/low other operational problems and solutions. Log book, staffing (boiler attender, fireman, gauge glass attender etc.) off seasonal work. Flue gas analysis boiler water analysis.

Power House & Electrical Dept.

Turbine, Alternator, AVR-Load distribution – turbine heating, change over, power factor, specific steam consumption-solving problems like priming, low boiler pressure. Cogeneration studies-off seasonal job staffing (Turbine operator, SBA, etc.,) Functioning of Electrical dept.

Complete the proforma 5, 6 & 7

2. CLARIFICATION

3 week

Juice Heating: Arrangement and distribution – heating surface, number to tubes, passes and other design parameters – steam/vapor utilization, temperature control taking and cutting heater from service, juice draining, cleaning, checking – double beet valves etc., - condensate extraction and pumping arrangement, non-condensable gases removal. Operational problems viz., Hammering, problems in pumping, leakage.

MOL Plant: Preparation of MOL, lime consumption, capacity, storage and pumping, equipment details. Grit removal, classifier.

Sulphur Burner: Production of SO₂, sulphur consumption, controlling the burning rate, temperature controlling, equipment details. Air supply compressor/blower working.

Sulphiter: Juice sulphitation technique, proportioning of SO₂ gas and MOL, settling test, capacity, retention time, equipment study. Syrup sulphitation.

Clarifier: Operation in underflow and overflow, juice and mud handling equipment, problems in settling.

Filtration: Equipment - Rotary Filter, Decanter, bagacillo blower, cyclone separator, mud mixer, proportioning of mud and bagacillo, operation of filter, vacuum system: Baby condenser, moisture trap, vacuum regulation (Heavy/Light), Vacuum Pump, filtrate receiver, washing of cake, judging the operation by observing the color and thickness of the cake. Troubles in filtration off-season work in the clarification section

3. EVAPORATION

- 2 week-

Working of multiple effect evaporator/falling film evaporator/semikestner, how to start the evaporator, how to distribute the vacuum, juice level regulation, noxious gas removal, condensate extraction, syrup pump trouble, high level in the bodies, vapor bleeding, vacuum problem, injection pump load checking, condenser spray & jet regulation, pan-evaporator vapor pressure stabilization, syrup load high, other operational problems like vacuum leakage, hammering, low pressure exhaust etc. Working of evaporator before and after cleaning. Heating surface, vapor pipe diameter of different bodies and other design parameters, instrumentation, pressure/vacuum/temperature of each body. Cleaning of evaporator, water test, vacuum test, Hydraulic test etc., off-season work.

4. PANFLOOR

- 4 week -

Construction and Working of Batch and Continuous Pan (Horizontal and Vertical Type)

Boiling 'A' massecuite: Quantity of seed, washing and setting of grains, giving drinks, removal of dust, cutting the footing, boiling of massecuite.

Manging the syrup, melt, AL load : Checking the brix of the massecuite for dropping, dropping the pan and re starting the pan.

Boiling of B & C massecuite: B and C graining, graining medium, slurry introduction, hardening, setting the grains, movement water, removal of false grains. Boiling the massecuite.

Operational problems viz., : Syrup and molasses load, low vapor pressure, vaccum trouble, want of crystaliser, high temperature boiling, etc., Monitoring the pan floor position. Co-ordination between evaporator and pan floor, distribution of pans, S/V ratio, capacity, stream/vapor management during starting and dropping of pans, vacuum crystalliser, seed crystallizer, automation at pans, off-season work.

Working of Spray pond/cooling tower, Injection water pumps, service pump, priming of pump, pump starting.

5. CRYSTALLIZER & CENTRIFUGALS

- 2 week -

Working of crystallizer, batch/continuous/MVC, distribution of crystallisers, capacity, cooling/reheating, transient heater, air/water cooled crystallizer.

Centrifugals: Type and make, curing of A massecuite, operation of the A centrifugal, operational, mechanical and electrical troubles, curing cold viscous massecuite, operation of continuous centrifugals, controlling of problems. Off-season work.

Drying of sugar, conveying, grader, grading of sugar, weighing and bagging, tacking of sugar bags, godown procedures, sugar sales etc.

6. CANE DEPARTMENT

- 1 week -

Introduce yourselves to CDO or Manager (Cane), brief him about the purpose of your visit, learn the functions of the dept, meet other officers, learn about the staffing pattern of the dept., understand the working procedure of the department. Note the cane area of the factory (Taluks, villages, number of growers etc), cane planting and harvesting procedures, cane varieties in the factory area, harvesting labor and cane transport arrangement, cane development plans. Organisation and working of the department, harvesting labor and cane transport arrangement. Cane Accounts: cane price and payment details.

7. Other Departments:

- 1 week-

Accounts: Cost of production of sugar. Pay role, cane payment etc.,

Personal Department: No of Employees and classification, working of time office.

Stores: Arrangement, receipt and Issue, purchase procedures.

Note the name of all the staff members, designation and their responsibilities.

Information to be collected in proforma

Proforma -1

- a) Name of the Factory
- b) Address
- c) Name of Chairman and Board of Directors
- d) Names of the Senior officers of the factory viz., MD, GM, CE, CCDO, AO etc
- e) Map of the factory cane area
- f) List of villages coming under factory zone
- g) Distance of nearest and farthest village from factory
- h) Distance between the neighbouring sugar factories
- i) Weekly Pol % cane, recovery % cane, total los% cane in 2013-14 and 2014-15 seasons
- j) Form I(1); specification of machinery
- k) Number of registered and unregistered growers current and previous season
- l) R.T 8(C) for the previous two seasons
- m) R.T 7(C) for the current season

Proforma – 2

Information regarding sugarcane varieties crushed for the current & previous season

SL No	Cane Variety	Type Early /mid /late	Area under (Ha)			Cane crushed (MT)		
			Plant	Ratoon	Total	Plant	Ration	Total

Proforma – 3

SL No	Size of the Holding	Number of Growers	
		Current Season	Previous Season
1	up to 1 acre		
2	1.0 – 2.0 acre		
3	2.0 – 5.0 acre		
4	5.0 – 7.0 acre		
5	7.0 -10 acre		

Proforma – 4

Classification of stoppages during current and previous season

Proforma – 5

Details of cane preparation index determined (weekly)

SL No	Date	Shift / Time	Preparatory Index	Remarks

Proforma – 6

Details of Brix curves drawn (Collect copy of Brix curves plot along with data)

Proforma – 7

Details of mill trials conducted along with all the analytical data.

Proforma – 8

Details of special analysis performed (At least one test per week)

- a) Reducing sugars in MJ, CJ and Syrup
- b) Sucrose % in M.J, C.J & Syrup
- c) P₂O₅ content in M.J and CaO content in CJ

Proforma – 9

Classification of different ranges of

- a) Recovery % cane b) R.M.E
- c) Molasses % Cane d) Final Molasses Purity for the season

Proforma – 10

Analysis of juice from each body of evaporator for brix and purity

Proforma -11

Analysis of Nutsch purity of 'C' massecuite and corresponding molasses purity

Proforma – 12

Comments on Analytical data, Pol balance, Brix balance, Non sugar balance

Proforma – 13

Details of pan boiling scheme and comments on the same.

Proforma – 14

Classification of stoppages

Range	No cane		Mechanical		Electrical		Prices		Cleaning		Misc		Total	
	No of times	Hrs lost	No of times	Hrs lost	No of times	Hrs lost	No of times	Hrs lost	No of times	Hrs lost	No of times	Hrs lost	No of times	Hrs lost
< 1 hr														
1- 4 hr														
4 - 8 hr														
8 - 24 hr														
> 24 hr														

Proforma – 15

Details of Major stoppages in every section and comments on the same

Proforma – 16

Complete description of cleaning day jobs

- a) Cleaning of Juice Heater, Evaporator and Pan (Details of Soda Boiling, time taken for tube cleaning, checking of tubes, etc.)
- b) Other maintenance jobs in the manufacturing section

Proforma -17

1. Working results of boiler station
2. Details of Boiler feed water treatment

Proforma – 18

Instrumentation: Details of instruments available and comments on their working/ Computerised Sugar Manufacturing/SCADA/DCS etc

Proforma - 19

- a) General Comments
- b) Problems faced and suggestions for improvement
- c) Future plans of the factory
- d) Conclusion
- e) Cost of production of Sugar if available
- f) Details of Sugar Godown

Format of In-plant Training Report

(Wherever necessary relevant proforma to be included)

1. Acknowledgement
2. Contents page
3. Introduction: This should contain history of factory, capacity, machinery suppliers, expansion if any. Growth prospects and plans of the company.
4. Specification of the machinery
5. Review of the previous season on the basis of RT-7C, and RT-8C; (review should cover)
 - a) Capacity Utilisarion of the plant including and excluding Stoppages
 - b) Milling and boiling house performance
 - c) Analysis of down-time or stoppages
 - d) Clarification efficiency, boiling house efficiency parameters.
6. Working in the current season
 - a) This should be compared with the working in the previous season
 - b) Important problems faced during the season
 - c) Cleaning day jobs, schedule
7. Steam economy measures, steam % care
8. Automation and Instrumentation
9. Report on any special equipment or process technique
10. Cane department
11. Reports, sketches, drawings etc.,
12. Conclusion

General Instructions:

1. All the sections of the factory must be covered in preparing the report.
2. Tables, graphs, sketches etc should be given for as many sections as possible. They should be followed by comments.
3. Candidate own assessment of working of each section should be given
4. Any Particular section should be taken for detailed study and the student should collect extensive data on that section
5. In many instances the factory may not be carrying out some laboratory analysis. The student should analyse himself and record the data.
6. Two self study electives should be chosen depending upon the availability of literature and resource persons.
7. Initially 75 - 90 days should be spent for learning the factory processing and 15-30 days for off seasonal jobs and report preparation.
8. Assignments should be submitted by E mail within the scheduled period for C1 and C2 IA