



BANGLADESH TECHNICAL EDUCATION BOARD
Agargoan, Dhaka-1207.

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM
SYLLABUS (PROBIDHAN-2016)

CONSTRUCTION TECHNOLOGY

TECHNOLOGY CODE: **688**

2nd SEMESTER

DIPLOMA IN ENGINEERING
PROBIDHAN-2016

CONSTRUCTION TECHNOLOGY (688)

2nd SEMESTER

Sl. No	Subject Code	Name of the subject	T	P	C	Marks				Total
						Theory		Practical		
						Cont. assess	Final exam	Cont. assess	Final exam	
1	66421	Civil Engineering Materials	2	3	3	40	60	25	25	150
2	68822	Construction Field Practices	1	3	2	20	30	25	25	100
3	65722	Communicative English	1	3	2	20	30	50	0	100
4	65811	Social Science	3	0	3	60	90	0	0	150
5	65921	Mathematics -2	3	3	4	60	90	50	0	200
6	65922	Physics-2	3	3	4	60	90	25	25	200
7	66611	Computer Application	0	6	2	0	0	50	50	100
Total			13	21	20	260	390	225	125	1000

66421

CIVIL ENGINEERING MATERIALS

T P C
2 3 3

AIMS

- To be able to identify and classify the materials used for construction in civil engineering field.
- To be able to recognize the sources of various civil engineering materials.
- To be able to understand the characteristics of various civil engineering materials.
- To be able to understand the uses of different civil engineering materials.

SHORT DESCRIPTION

Aspects of engineering materials; Engineering uses of Stone; Bricks; Sand; Cement; Timber ; Aluminum as construction materials; Timber & Wood based materials ; Glass and ceramics; Paints and varnishes; Plastic materials ; Alloy & Matel; Insulating materials; Geo-Textile ; Lime and water proofing materials.

DETAIL DESCRIPTION

1 Various aspects of civil engineering materials.

- 1.1 Define civil engineering materials.
- 1.2 Mention the classification of civil engineering materials in civil technology

2 Stone

- 2.1 Define stones.
- 2.2 Mention geological, physical and chemical classification of stones.
- 2.3 List the characteristics of good stones for construction.
- 2.4 Describe the dressing of stones.
- 2.5 Describe the uses of stone in civil engineering filed.

3 Brick & Hollow block.

- 3.1 Define bricks
- 3.2 Mention the raw materials of Bricks and properties of good bricks making earth.
- 3.3 Explain the Preparation of clay (manual/mechanically): Pug mill and Machine molding.
- 3.4 Explain the procedures of drying and burning bricks.
- 3.5 Mention the types of kilns: Bull's Trench Kiln & Hoffman's Kiln.
- 3.6 Explain the Size of Brick as per BNBC & PWD specification.
- 3.7 Explain Common testing of Bricks as per BNBC
Compressive strength, Water absorption, Efflorescence, Dimensional tolerance Test.
- 3.8 Define Special Bricks: Hollow Block & ceramic brick
- 3.9 Mention the uses of hollow block and ceramic brick
- 3.10 State the Advantage and disadvantage of hollow block and ceramic brick

4 Sand.

- 4.1 Classify sand according to their sources.
- 4.2 Mention the specifications of good sand.
- 4.3 Describe the purpose of grading of sand.
- 4.4 Mention the use of various grades of sand.

5 Cement.

- 5.1 Define cement.
- 5.2 Mention the Raw materials of cement & functions of various ingredients of cement.
- 5.3 Explain manufacture process of ordinary Portland cement, Flow diagram for wet and dry process.
- 5.4 Mention the properties and uses of ordinary Portland cement.
- 5.5 Explain the testing of cement as per BNBC : Strength of Cement , Fineness by sieving, Consistency, Soundness, Setting times.
- 5.6 Understand special cement and their uses.
- 5.7 Explain storage of cement.

6 Tiles

- 6.1 Define the following tiles: clay tiles, concrete tiles, Plastic tiles, Mosaic tiles, Marble tiles, Glazed tiles. Homogenous tiles
- 6.2 Explain the uses of different kinds of tiles.

7 Timber & Wood Based Products

- 7.1 Explain the classification of trees: Exogenous and Endogenous trees and their cross section.
- 7.2 Explain the various types of timber: Teak, Shilkarai, Mehegoni, Gamari, Teak Chambal, Mango, etc.
- 7.3 Mention the market forms of converted timber as per PWD.
- 7.4 Explain seasoning of Timber and method of seasoning.
- 7.5 Explain plywood; manufacturing plywood (brief description only), uses of plywood.
- 7.6 Explain the Veneers.
- 7.7 Define other wood based products, their brief description of manufacturing and uses.
- 7.8 Laminated board, block board, fiber board, MDF board, melamine board and gypsum board. Applications of boards in false ceiling and wall paneling.

8 Glass and Ceramics.

- 8.1 Mention the constituents of glass.
- 8.2 Define the various types of Glass as per use like: Plate glass, weird glass, Tempered glass, colored glass, fiber glass, formed glass, float glass.
- 8.3 Explain the properties of glass.
- 8.4 Mention the uses of glass
- 8.5 Mention the classification of ceramics.
- 8.6 Explain the properties of ceramics.
- 8.7 Mention the uses of ceramics in civil engineering field.

9 Paints and varnishes.

- 9.1 Understand the purpose and uses of paints.
- 9.2 Explain the different type of paints: Distemper, plastic paint, enamels paint, cement paint, weather coat paint for outside of the building.
- 9.3 Understand varnishes and polish types properties and their uses
- 9.4 Explain lacquers their properties and their uses
- 9.5 Define the method of Application of different types of paints.

10 Plastic

- 10.1 Define plastic.
- 10.2 Explain the list the of raw materials for plastic.
- 10.3 Mention the type of properties of plastic.
- 10.4 Mention the characteristics of thermoplastic and thermosetting plastic.
- 10.5 Identify the uses of plastic as an engineering materials.
- 10.6 Define laminating plastic.

11 Alloy and Metals

- 11.1 Define the common types of iron used in industry.
- 11.2 Mention the uses of wrought iron and cast iron.
- 11.3 Mention the classification of steel on the basis of carbon content.
- 11.4 Define the Mild steel, alloy steel and stainless steel.
- 11.5 Mention the uses of non-ferrous metals and alloys like copper, zinc, tin, lead, brass and bronze.
- 11.6 Define light metal (aluminum/white metal) as construction material.
- 11.7 Mention the uses of aluminum as construction materials.

12 Insulating Materials

- 12.1 Define insulating materials
- 12.2 Make a list of insulating materials
- 12.3 State sound and thermal insulation
- 12.4 Mention the uses of insulation materials

13 Geo-textiles

- 13.1 Introduction to geo-textiles
- 13.2 Mention the Uses of geo-textiles
- 13.3 Describe the Advantage and disadvantage of geo-textiles

14. Lime:

- 14.1 Define the lime
- 14.2 Mention the Uses of lime
- 14.3 List the Advantage and disadvantage of lime

15 Construction chemicals & Water proofing Matrials

- 15.1 Define Construction chemicals/Admixture.
- 15.2 Make a list of contruction chemicals
- 15.3 Mention the uses of construction chemicals
- 15.4 Define water proofing Materials.
- 15.5 Make a list of water proofing materials
- 15.6 Mention the uses of water proofing materials.

PRACTICAL:

1. Show skill in identifying various types of stone
 - 1.1. Select different type of stone in the laboratory.
 - 1.2. Grading of stone as aggregates
2. Show skill in field test of bricks
 - 2.1. Perform field test of bricks
 - 2.2. Select 1st class , 2nd class, 3rd class bricks and jhama bricks
3. Show skill in conducting laboratory test of bricks
 - 3.1. Perform:
 - (a) Compression test
 - (b) Absorption test
 - 3.2. Determine average weight of a brick.
4. Show skill in conducting laboratory test of cement
 - 4.1. Conduct laboratory tests of cement
 - (a) Make cement paste of Normal Consistency(CPNC)
 - (b) Determine initial setting time
 - (c) Perform final setting time
 - (d) Perform compressive strength test
 - (e) Perform tensile strength test
 - (f) Perform fineness test
 - 4.2. Conduct field tests of cement
5. Show skill in conducting test of sand
 - (a) Bulking of sand
 - (b) F M of sand
 - (c) Specific gravity of sand
6. Identify mild steel, cast iron, copper, and, aluminum, tin, by physical observation.
7. Identify Various types of wood and artificial wood: Veneers , plywood, Laminated board, block board, fiber board and gypsum board.

REFERENCE BOOKS

- 1 A text book on Engineering Materials - G. J. Kulkarni
- 2 Engineering Materials - Dr. M. A. Aziz
- 3 Plastic Materials - J. A Brydson

AIMS

To be able to develop knowledge, skill and attitude of construction engineering with special emphasis on:

- To be able to understand different construction engineering Works.
- To develop knowledge of different construction engineering Works.
- To impart knowledge and skill to use tools, machines, equipments and measuring instruments.

SHORT DESCRIPTION

Aspects of Construction engineering works; Layout of different Construction Engineering drawing; Concrete works ; Bricks works ; Mortar and Plaster; Plumbing fitting and fixture ; Wood works ; Welding, Joints.

DETAIL DESCRIPTION

3 Introduction of Construction engineering work.

- State the meaning of Construction Engineering work.
 - List different types of construction work.
- 1.3 Mention the field opportunity of Construction Engineering.
- 1.4 Describe the job Prospects of Construction Engineer.

2. Layout in Field

- 2.1 Meaning of Layout.
- 2.2 Instruments and accessories for Layout.
- 2.3 Necessity of Layout.
- 2.4 Understand of layout of a simple building
- 2.4 Understand of a Road Layout in Field.

3. Concrete Works.

- 3.1 Define of concrete.
- 3.2 List of tools and materials for concrete works.
- 3.2 State Ratio of concrete materials.
- 3.3 Describe of concrete mixing in field.
- 3.4 State meaning of concrete curing.

4. Bricks work.

- 4.1 Define Bricks works
- 4.2 Identification different tools required for brick works.
- 4.3 Mention the steps for bricks works.
- 4.4 Mention the defect of bricks works.

5. Mortar and Plaster.

- 5.1 Define cement mortar.
- 5.2 Mention materials requirements of cement mortar.
- 5.3 Mention use of mortar
- 5.4 Define plaster.
- 5.5 Describe the necessity of Plaster.

6. Plumbing fitting and Fixtures.

- 6.1 Define fitting and fixture.
- 6.2 List of fitting and fixtures.
- 6.3 Differentiate between fitting and fixtures.
- 6.4 Description and demonstration of various types of drills, taps and dies.
- 6.5 Selection of dies for tapping.
- 6.6 Mention types of taps, tapping and drilling operation.

- 7. Wood work**
 - 7.1 Introduction to joints.
 - 7.2 List of Tools for wood works.
 - 7.3 Mention different type of Wood Joints.
 - 7.4 Describe the necessity of Wood Joints.

- 8. Welding.**
 - 8.1 Define welding.
 - 8.2 Necessity of welding.
 - 8.3 Classify of welding work.
 - 8.4 Mention different types of welding.
 - 8.5 Mention the raw material for welding.

- 9. Joints**
 - 9.1 Define Joints.
 - 9.2 Necessity of Joints.
 - 9.3 Classify of Joints.
 - 9.4 Distinguish between Joints and Welding

PRACTICAL:

1. Perform Shielded metal arc welding (SMAW)

- 1.1 Select and collect tools and equipments as per job requirement.
- 1.2 Perform welding (Lap joint, Butt joint, T joint and Corner joint).

2. Perform Plumbing Work

- 2.1 Select and collect tools and equipments as per job requirement.
- 2.2 Perform a utility job involving all operations: Elbow, Union, Socket and taps etc.
- 2.3 Perform setting of a basin.

3. Perform Layout works in Field

- 3.1 Select and collect tools and equipments as per job requirement.
- 3.2 Perform layout of a simple building.
- 3.3 Perform layout of a Road in Field

4. Perform Wood Work

- 4.1 Select and collect tools and equipments as per job requirement.
- 4.2 Preparation of at least one utility job involving different joints.

5. Perform Plaster in Field

- 5.1 Select and collect tools and equipment as per job requirement.
- 5.2 Prepare cement mortar using specific ratio.
- 5.3 Perform Plaster work in field.

6. Perform Brick works in Field

- 6.1 Select and collect tools and equipments as per job requirement.
- 6.2 Prepare a model of brick wall.

7. Perform Concrete Work in Field

- 7.1 Select and collect tools and equipments as per job requirement.
- 7.2 Perform concrete mixing.
- 7.3 Prepare of concrete cube and cylinder.

REFERENCE BOOKS:

- | | | |
|---|--------------------------|------------------------------|
| 4 | Prathomic Fitting Sikkha | - Hemanta Kumar Bhattacharia |
| 5 | Welding Engineering | - Rosse |
| 6 | Building materials | - P.C. Varghese |
| 7 | Engineering Materials | - M. A. Aziz |

65722

COMMUNICATIVE ENGLISH

T P C
1 3 2

Full Marks: 100 (Practical-50.Theoretical-50)

Introduction

This Course Will Provide A Unique Foundation In The Basic Level For Developing Listening, Speaking, Reading And Writing Skills Into Some Of More Specialized And Advanced Capabilities Of Basic Operation In Communication.

Theory Part

Total Mark: : 50
Continuous Assessment : 20
Final Exam : 30

Objectives:

After The Completion of the Module, Learners Will Be Able To Develop-

- # Creative Writing Ability
- # Transferring Information, Ideas And Knowledge
- #Communicative Competence Effectively In The Workplace Situation.

1.Comprehension For Reading Task (Mark:10)

(Text May Be Taken From Contemporary Journals, Editorial of News Papers Or From Online Resources)

Test Items:

1. MCQ (Guessing Meaning from Context)
2. Rearranging
3. Gap-Filling (With Clues or Without Clues)
4. Answering Questions
5. Summarizing

2. Composition (Mark: 20)

The Following Are The Topic Title Introduced For Writing Task:

1. Introduce Formal/Informal Greeting & Farewell
2. Describe The Idea Of Communication & Presentation Skills
3. Write Paragraph On The Basis Of Comparison and Contrast
4. Narrate Process, Stories And Interpreted Charts, Graphs.
5. Write Letters to the Print and Electronic Media
6. Write Letters of Advice, Complaints, Inquiry, Order and Cancellation
6. Prepare Seven Days Weather Report.
7. Make An Attractive Poster For The People Giving Advice To Protect The Environment.
8. Prepare A Series Of Questions About Personal Information, Place Of Interest, Foods, Hobby And Employment Opportunity.
9. Write Dialogue On The Following Situations
 - # About Exchanging Views With A Person And Introducing One Narrating Daily Activities
 - # Meeting At The Train Station & Asking Question About The Departure And Arrival Of The Train To The Station Manager
 - # Meeting at The Airport And Asking The Flight Schedule
 - # Getting To The Hotel And Asking For A Reservation
 - # Social Language for Telephonic Conversation
 - # Talking About the Weather, Trips & Sight Seeing
 - # Asking Permission and Making Request.
 - # Talking About Office and Office Manner
 - # Talking About Etiquette and Manner

10. Prepare Job Application With A Complete CV For Job Suitable For You.

Practical Part:

Objectives:

- 1. Communicate The Areas That Learners Encounter In Real Life Situation.**
- 2. Reinforce The Basic Language Skills Of Listening And Speaking.**
- 3. Integrate ICT As Tools In Learning Language.**

Course Content

Unit	Lesson	Title
1. Use Of Dictionary	Define Dictionary	1.1 Know How To Use A Dictionary 1.2 Learn At Least 10 Words In A Day With Correct Pronunciation (Follow The Link : Www.Marrionm-Englishdictionary.Com)
2. Basic Vocabulary Practice	Basic Words For Communication By ODGENS	2.1 Use 10 Most Common Formulas (Structure) To Write Correct Sentence. (Follow The Link: Www.Odgenbasicvocabulary.Com Www.Grammarly.Com)
3. Listening Skill Practice	Listen To The Audio Video Presentation On Current Real Life Situation	3.1 Practice Audio Video Conferencing Activities. 3.2. Communicate With The English Speaking People Online (Link: Www.Speaking24.Com)
4. Speaking Skill Practice (Self Interpretation)	Introduce Yourself With The Vocabulary Prescribed By ODGENS	4.1 Browse Vocabulary Related Phrases To Introduce You. (Link : Www.Youtube.Com/ Let Me Introduce Myself)
5. Listening Skill Practice	Listen To The Weather Reports, Sports Commentary In The English TV Channels.	5.1 Prepare Seven Days Weather Report For The Place You Are Staying. 5.2. Make Some Attractive Poster To Protect The Environment.
6. Speaking Skill Practice	Identify Formal And Informal Social Language	6. 1 Practice Conversation Emphasizing On Greetings & Farewell (Link- Www.Esl.Guide@About.Com) 6.2 Take Part In Audio Video Conferencing Activities 6.3 Ask Questions About Personal Information, Place Of Interest, Food, Hobby, Employment Opportunity With Foreign Friends Using Social Media.
7. Writing Skill Practice	Develop Paragraph	7.1 Develop Paragraph On The Basis Of Comparison, Contrast And Analysis. Check Plagiarism Wordiness By The Correction Software (Www.Grammarly.Com) 7.2. Write E-Mail, Send And Reply E-Mail

8. Listening Skill Practice	Watch Short Films, Documentary And Listen To The English Music(With Lyric) To Practice In A Group	8.1 Listen To Hard Talk, Interview 8.2. Prepare A Series Of Questions To Interview A Celebrity 8.3. Down Load Documentary From Www.Youtube.Com/Education
9. Presentation	Define Presentation	9.1 Edutain/Entertain Yourself Preparing A Documentary In A Group With The Activities Done During The Period Of Class Hours In The Lab For Communicative English.

Evaluation:

Students Can Be Evaluated Individually Or In A Group On The Basis Of Performance Done In The Lab. Furthermore, They May Be Given Online Test Using Authenticated Websites Like

www.Britishcouncil.Org/Education/Blog/Podcast/News/Weather, www.Englishteststore.Com, www.Ieltsexam.Com

Lab-Facilitator, 30 Students In A Group:

Physical Facility	Size (In Ft)	Area (In Sq Ft)
Class Room Cum Laboratory	15 × 20	300
Library	15 × 20	300
Wash Room	4 × 7	28

Lists Of Equipments And Resources For 30 Learners:

Personal Computers With Accessories	15
Projector Multimedia	01
Printer	01
Scanner	01
Modem	01
Essential Software	01 Set
Internet Connection For Each Computer	Broad Band/Dial Up
Camera (Digital)	01
Video Conferencing Equipments	01 Set
TV Card	01
Satellite Cable Connection	01
Head Phone	15
Related Books And Journals	01
First Aid Box	01

Reference:

www.Britishcouncil.Org, www.Marium-Websters.Com, www.Compellingconversation.Com,
www.Esl.Guide@About.Com, www.Bbc.Com/News, www.Speaking24.Com, www.Itutor.Com,
www.Ieltsexam.Com, www.Englishteststore.Com, www.Ginger.Com, www.Grammarly.Com

(Note: This Course May Be Introduced After Fourth Semester Coz It Needs Some Maturity Of The Students To Adopt With The Course Materials And The Contents. These Themes Are Suggestive Not Prescriptive.)

65811

SOCIAL SCIENCE

T	P	C
3	0	3

OBJECTIVE

To provide opportunity to acquire knowledge and understanding on :

- importance of civics and its relationship with other social sciences
- The relationship of an individual with other individuals in a society
- social organizations, state and government
- rule of law, public opinion and political parties
- UNO and its roles
- The basic concepts and principles of economics and human endeavor in the economic system.
- The realities of Bangladesh economy and the current problems confronting the country.
- The role of Diploma Engineers in industries.
- our motherland and its historical background
- good citizenship through practicing our socio- economic culture
- liberation war and its background
- nationalism and life style of the nation

SHORT DESCRIPTION

Civics and Social Sciences; Individual and Society; Nation and Nationality; Citizenship; state and government; Law; Constitution; Government and its organs; public Opinion; Political Party; UNO and its organs; Scope and importance of Economics; Basic concepts of Economics- Utility, Wealth, Consumption, income wages, salary, value in use and savings; Production – meaning, nature, factors and laws; Demand and Supply; market equilibrium, national income, Current economic problems of Bangladesh; Role of Diploma Engineers in the economic development of Bangladesh; Occupations and career planning; Engineering team.

Part-1 (Civics)

1. Understand the meaning and scope of civics and inter relations of social sciences.

- 1.1 Define civics and social science.
- 1.2 Explain the importance of civics in the personal and social life of an individual.
- 1.3 Describe the relationship of all social science (civics, Economics, political science, Sociology, ethics)

2. Understand the relationship of the individual with the society, Nationality and nation, Rights and duties of a citizen.

- 2.1 Define the concept (individual, society, socialization, Nation, Nationality, citizen and citizenship).
- 2.2 State the relationship among the individuals in the society.
- 2.3 Discuss the methods of acquiring citizenship and state the causes of losing citizenship
- 2.4 Describe the rights of a citizen and state the need for developing good citizenship.

3. Appreciate the relationship between the state and government, law and organs of government.

- 3.1 Meaning the state, government and law
- 3.2 Discuss the elements of state.
- 3.3 Discuss the classification of the forms of government
- 3.4 Distinguish between cabinet form of Government and presidential form of government.
- 3.5 Describe the main organs of Government (legislature, Executive and judiciary)
- 3.6 Discuss the sources of law

4. Understand and the classification of constitution

- 4.1 Define the Constitution.

- 4.2 Explain the deferent form of Constitution
- 4.3 Explain state the salient feature of Bangladesh constitution.
- 4.4 Define the fundamental rights of Bangladesh constitution.
- 4.5 Meaning of human rights.

5. Understand the role of UNO in maintaining world peace

- 5.1 Explain the major functions of UNO.
- 5.2 State the composition and functions of General Assembly.
- 5.3 Describe the Composition and functions of Security Council.
- 6.4 Discuss the role of Bangladesh in the UNO.

6. Understand the role of Ethics values and good governance

- 6.1 Define the values, ethics and good governance.
- 6.2 Discuss the role of government to establish good governance

Part-2 (Economics)

1. Understand the fundamental concepts of economics.

- 1.1 Define the Microeconomics and Macroeconomics.
- 1.2 Discuss the definition of Economics as given by eminent economists.
- 1.3 Describe the importance of economics for Technical Student.
- 1.4 Define commodity, utility, value, wealth, consumption, income, savings, wages, value in use, value in exchange and salary.
- 1.5 Differentiate between value in use and value in exchange.
- 1.6 Explain wealth with its characteristics.

2. Understand the production process and the concept of the law of diminishing returns in the production process.

- 2.1 Discuss production mode and process
- 2.2 Explain the nature of different factors of production.
- 2.3 Discuss production function.
- 2.4 Discuss the law of diminishing returns.
- 2.5 State the application and limitations of the law of diminishing returns.
- 2.6 Describe the law of production (increasing constant and diminishing).

3. Understand the concept of demand, supply and utility.

- 3.1 Define the term, “demand and supply”.
- 3.2 Explain the law of demand and supply .
- 3.3 Draw the demand and supply curve.
- 3.4 Discuss Market equilibrium.
- 3.5 Define the utility, total and marginal utility
- 3.6 Illustrate the law of diminishing utility.
- 3.7 Explain the law of diminishing marginal utility

4. Understand national income.

- 4.1 Define nation income.
- 4.2 Explain how to measure national income.
- 4.3 Discuss GNP, GDP and NNP.
- 4.4 Discuss economic development and growth

5. Understand the current issues and the availability and use of natural resource in the economic development of Bangladesh

- 5.1 Define rural and urban economics.
- 5.2 Identify major problems of rural and urban economy.
- 5.3 Explain the migration of rural population to urban areas.
- 5.4 List of the Natural resource of Bangladesh and classify them according to sources of availability.
- 5.5 Explain the importance of the mine, forest and water resources and potential uses for sustainable development.

6. Role of a Diploma Engineer in the Development of Bangladesh Economy.

- 6.1 Explain the concept of the term, “Engineering team”
- 6.2 Identify the functions of Engineers, Diploma Engineers, craftsmen forming the engineering team.
- 6.3 Discuss the role of a Diploma Engineer in the overall economic development of Bangladesh.
- 6.4 Explain socio-economic status of a diploma Engineer.

Part-3 ((Bangladesh: History& Culture)

সংক্ষিপ্ত বিবরণী

ইতিহাস

- ইতিহাসের সংজ্ঞা।
- বাংলাদেশের আবহাওয়া ও অধিবাসী।
- বাংলায় ইংরেজ শাসন ক্ষমতালভ ও প্রতিষ্ঠা।
- ব্রিটিশ বিরোধী সশস্ত্র প্রতিরোধ আন্দোলন; সংস্কার আন্দোলন ও জাতীয়তাবাদে বিকাশ এবং বাংলার নবজাগরণ; বঙ্গভঙ্গ ও বঙ্গভঙ্গ উত্তরকালে বাংলার রাজনীতি ও দেশ বিভাগ।
- পাকিস্তান আমলে বাংলাদেশ, বঙ্গবন্ধুর নেতৃত্বে বাংলাদেশের মুক্তি সংগ্রাম ও স্বাধীনতালভ।

সংস্কৃতি

সংস্কৃতি, সভ্যতার সংজ্ঞা, সংস্কৃতির প্রকরণ, ভাষা আন্দোলন উত্তর বাংলার সংস্কৃতি, স্বাধীনতা উত্তর বাংলাদেশের সংস্কৃতির বিবর্তন, বাংলাদেশের সংস্কৃতিতে প্রত্নতাত্ত্বিক নিদর্শন ও ক্ষুদ্র নৃতাত্ত্বিক গোষ্ঠীসমূহ।

সহায়ক পুস্তক

হক, মোজাম্মেল “পৌরনীতি”- হাসান বুক হাউস
প্রফেসর এমাজউদ্দিন “রাষ্ট্রবিজ্ঞান” আজিজিয়া লাইব্রেরী
আলী, মাসুম “অর্থনীতি”
চক্রবর্তী, মনতোষ- “প্রিন্সিপলস অব ইকোনোমিক্স”
মার্শাল, আলফ্রেড,-“ প্রিন্সিপলস অব ইকোনোমিক্স”
রহমান, আনিসুর -“অর্থনীতি”
রহিম, চৌধুরী, মাহমুদ ও ইসলাম, “বাংলাদেশের ইতিহাস (পরিবর্তিত ও পরিমার্জিত)” ; নওরোজ কিতাবিস্তান, আগস্ট, ১৯৯৯।
কে, আলী“বাংলাদেশের ইতিহাস”; আজিজিয়া বুক ডিপো, ২০০১।
সিরাজুল ইসলাম, “বাংলাদেশের ইতিহাস-১৭০৪-১৯৭১”; ১ম, ২য় ও ৩য় খন্ড; বাংলাদেশ এশিয়াটিক সোসাইটি, ফেব্রুয়ারি ২০০০।
কো-আন্টোনভা, প্রি, কতোভস্কি, “ভারত বর্ষের ইতিহাস”; প্রগতি প্রকাশন, ১৯৮৮।
গোপাল হালদার; “সংস্কৃতির রূপান্তর”; মুক্তধারা, মে ১৯৮৪।
মোতাহের হোসেন চৌধুরী, “সংস্কৃতি কথা”; নওরোজ কিতাবিস্তান, জানুয়ারি ১৯৯৮।
গোপাল হালদার, “বাংলা সাহিত্যের রূপরেখা-১ম ও ২য় খন্ড”; মুক্তধারা।

OBJECTIVES

- To enable in solving the simultaneous equations with the help of determinant and matrix.
- To make understand the exponential series.
- To provide ability to apply the knowledge of differential calculus in solving problem like slope, gradient of a curve, velocity, acceleration, rate of flow of liquid etc.
- To enable to apply the process of integration in solving practical problems like calculation of area of a regular figure in two dimensions and volume of regular solids of different shapes.

SHORT DESCRIPTION

Algebra : Determinants, Matrix, Exponential Series.

Trigonometry : Inverse circular functions, Properties of triangle and solution of triangles.

Differential Calculus : Function and limit of a function, differentiation with the help of limit, differentiation of functions, geometrical interpretation of $\frac{dy}{dx}$, successive differentiation and Leibnitz theorem, partial differentiation.

Integral Calculus : Fundamental integrals, integration by substitutions, integration by parts, integration by partial fraction, definite integrals.

DETAIL DESCRIPTION**ALGEBRA :****1 Apply determinants to solve simultaneous equations.**

- 1.1 Expand a third order determinant.
- 1.2 Define minor and co-factors.
- 1.3 State the properties of determinants.
- 1.4 Solve the problems of determinants.
- 1.5 Apply Cramer's rule to solve the linear equation.

2 Apply the concept of matrix.

- 2.1 Define matrix, null matrix, unit matrix, square matrix. column matrix, row matrix, inverse matrix, transpose matrix, adjoint matrix, rank of a matrix, singular matrix.
- 2.2 Explain equality, addition and multiplication of matrix.
- 2.3 Find the rank of a matrix.
- 2.4 solve the problems of the following types:
 - i) Solve the given set of linear equations with the help of matrix.
 - ii) Find the transpose and adjoint matrix of a given matrix.

3 Understand exponential series.

- 3.1 Define e.
- 3.2 Prove that e is finite and lies between 2 and 3.
- 3.3 Prove that $e^x = 1 + \frac{x}{1} + \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \dots$ to ∞
- 3.4 Solve problems of the followings types :
 - i) $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots$ to ∞
 - ii) $\frac{1}{2} + \frac{1+2}{3} + \frac{1+2+3}{4} + \frac{1+2+3+4}{5} + \dots$ to ∞

TRIGONOMETRY

4 Apply the concept of inverse circular function.

4.1 Explain the term inverse circular function and principal value of a trigonometrical ratio.

4.2 Deduce mathematically the fundamental relations of different circular functions.

4.3 Convert a given inverse circular function in terms of other functions.

4.4 Prove mathematically

$$\text{i) } \tan^{-1} x + \tan^{-1} y = \tan^{-1} \frac{x + y}{1 - xy} .$$

$$\text{ii) } \tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \tan^{-1} \frac{x + y + z - xyz}{1 - xy - yz - zx}$$

$$\text{iii) } \sin^{-1} x + \sin^{-1} y = \sin^{-1} \left(x\sqrt{1 - y^2} + y\sqrt{1 - x^2} \right)$$

$$\text{iv) } 2 \tan^{-1} x = \sin^{-1} \frac{2x}{1 + x^2} = \cos^{-1} \frac{1 - x^2}{1 + x^2} = \tan^{-1} \frac{2x}{1 - x^2}$$

4.5 Solve problems of the following types.

$$\text{a) } 2 \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{4} = \frac{\pi}{4}$$

$$\text{b) } \cos \tan^{-1} \cot \sin^{-1} x = x.$$

c) Prove that the area of the segment cut from a circle of radius r by a chord at a distance d from the centre is given by

$$K = r^2 \cos^{-1} \frac{d}{r} - d\sqrt{r^2 - d^2}$$

5 Apply the principle of properties of triangles.

5.1 Prove the followings identities :

$$\text{i) } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R .$$

$$\text{ii) } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{iii) } a = b \cos C - c \cos B .$$

$$\text{v) } \Delta = \frac{1}{2} bc \sin A.$$

5.2 Establish the followings.

$$\text{a) } \tan \frac{A}{2} = \sqrt{\frac{(s - b)(s - c)}{s(s - a)}}$$

$$\text{b) } \tan \frac{B - C}{2} = \frac{b - c}{b + c} \cot \frac{A}{2}$$

$$\text{c) } \Delta = \frac{abc}{4R}$$

5.3 Solve the problems of the following types:

$$\text{i) } \text{Prove } \cos(B - C) + \cos A = \frac{bc}{2R}$$

ii) An object experiences two forces F_1 and F_2 of magnitude 9 and 13 Newtons with an angle 100° between their directions. Find the magnitude of the resultant R .

DIFFERENTIAL CALCULUS

6 Understand the concept of functions.

6.1 Define constant, variable, function, domain, range

6.2 Solve problems related to functions.

7 Understand the concept of limits.

7.1 Define limit and continuity of a function.

7.2 Distinguish between $\lim_{x \rightarrow a} f(x)$ and $f(a)$.

7.3 Establish (i) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$

(ii) $\lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$

8 Understand differential co-efficient and differentiation.

8.1 Define differential co-efficient in the form of

$$\frac{dy}{dx} = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

8.2 Find the differential co-efficient of algebraic and trigonometrical functions from first principle.

9 Apply the concept of differentiation.

9.1 State the formulae for differentiation:

(i) sum or difference

(ii) product

(iii) quotient

(iv) function of function

(v) logarithmic function

9.2 Find the differential co-efficient using the sum or difference formula, product formula and quotient formula.

9.3 Find the differential co-efficient function of function and logarithmic function.

10 Apply the concept of geometrical meaning of $\frac{dy}{dx}$

10.1 Interpret $\frac{dy}{dx}$ geometrically.

10.2 Explain $\frac{dy}{dx}$ under different conditions

10.3 Solve the problems of the type:

A circular plate of metal expands by heat so that its radius increases at the rate of 0.01 cm per second. At what rate is the area increasing when the radius is 700 cm ?

11 Use Leibnitz's theorem to solve the problems of successive differentiation.

11.1 Find 2nd, 3rd and 4th derivatives of a function and hence find n -th derivatives.

11.2 Express Leibnitz's theorem

11.3 Solve the problems of successive differentiation and Leibnitz's theorem.

12 Understand partial differentiation.

12.1 Define partial derivatives.

12.2 State formula for total differential.

12.3 State formulae for partial differentiation of implicit function and homogenous function.

12.4 State Euler's theorem on homogeneous function.

12.5 Solve the problems of partial derivatives.

INTEGRAL CALCULUS

13 Apply fundamental indefinite integrals in solving problems.

13.1 Explain the concept of integration and constant of integration.

13.2 State fundamental and standard integrals.

13.3 Write down formulae for:

(i) Integration of algebraic sum.

(ii) Integration of the product of a constant and a function.

13.4 Integrate by method of substitution, integrate by parts and by partial fractions.

13.5 Solve problems of indefinite integration.

14 Apply the concept of definite integrals.

14.1 Explain definite integration.

14.2 Interpret geometrically the meaning of $\int_a^b f(x) dx$

14.3 Solve problems of the following types:

(i) $\int_0^{\pi/2} \cos^2 x \, dx.$ (ii) $\int_0^1 \frac{(\sin^{-1} x)^2}{\sqrt{1-x^2}} dx$

P* =Practical continuous assessment

SL No	Athour	Reference Title	Publication
01	S. P Deshpande	Mathematics for Polytechnic Students	Pune Vidyarthi Graha Prakashan
02	H. K. Das	Mathematics for Polytechnic Students(Volume I)	S.Chand Prakashan
03	Shri Shantinakaran	Engg.Maths Vol I & II	S.Chand & Comp
04	Dr. B M Ekramul Haque	Higher Mathematics	Akshar Patra Prakashani
05	Md. Abu Yousuf	Differential & Integral Calculus	Mamun Brothers

OBJECTIVES

- To develop a foundation in scientific principles and processes for the understanding and application of technology.
- To develop an understanding of fundamental scientific concepts through investigation and experimentation.
- To provide a common base for further studies in technology and science.
- To develop the basic knowledge of modern physics.

SHORT DESCRIPTION

Thermometry and Heat Capacity; Expansion of materials (effect of heat); Heat transfer; Humidity; Nature of heat and Thermodynamics; Photometry; Reflection of light; Refraction of light; Electron , photon and Radio activity; Theory of Relativity.

DETAIL DESCRIPTION

THEORY

1. THERMOMETRY AND HEAT CAPACITY

- 1.1 Define heat and temperature.
- 1.2 Mention the units of measurement of heat and temperature.
- 1.3 Distinguish between heat and temperature.
- 1.4 Identify the range of the Celsius scale determined by the boiling point and melting point of water
- 1.5 State the construction and graduation of a mercury thermometer.
- 1.6 Define specific heat capacity, thermal capacity and water equivalent with their units.
- 1.7 Prove the total heat gained by an object is equal to the sum of the heat lost by all the surrounding objects.
- 1.8 Explain the principle of calorimetry.
- 1.9 Define various kinds of specific latent heat.
- 1.10 Determine the latent heat of fusion of ice and latent heat of vaporization of water.
- 1.11 Determine the specific heat of a solid by calorimeter.

2. EFFECT OF HEAT ON DIMENSION OF MATERIALS

- 2.1 Show that different materials change in size at different amounts with the same heat source.
- 2.2 Explain the meaning of differential expansion in bimetallic strip, thermostats, compensated pendulum etc.
- 2.3 Explain the methods of overcoming problems caused by the expansion of materials in buildings, machinery, railway lines and bridges.
- 2.4 Mention the units co-efficient of linear, superficial and cubical expansion of solids.
- 2.5 Define the co-efficient of linear, superficial and cubical expansion of solids.
- 2.6 Relation between the co-efficient of linear, superficial and cubical expansion of solids.
- 2.7 Define real and apparent expansion of liquid.

- 2.8 Relation between the real and apparent expansion of liquid.

3. HEAT TRANSFER

- 3.1 Identify the phenomena of heat transferring from hot bodies to cold bodies.
3.2 Explain the methods of heat transfer by conduction, convection and radiation with examples of each type of transfer.
3.3 Define thermal conductivity (K) and Co-efficient of thermal conductivity.
3.4 Find the unit and dimension of Co-efficient of thermal conductivity.
3.5 List the factors which determine the quantity of heat (Q) flowing through a material.
3.6 Show that the quantity of heat flowing through a material can be found from
$$Q = \frac{KA (\theta_H - \theta_C)t}{d}$$

3.7 State Stefan-Boltzman Law and wien's law.
3.8 State Newton's law of cooling.
3.9 Explain Green house effect.

4. HUMIDITY

- 4.1 Define Standard Temperature and Pressure.
4.2 Define Humidity, Absolute Humidity, Relative Humidity and Dewpoint.
4.3 Relation between vapour pressure and air pressure.
4.4 Determine Humidity by wet and dry bulb hygrometer.
4.5 Explain few phenomena related to hygrometry.

5. NATURE OF HEAT AND THERMODYNAMICS

- 5.1 Describe the caloric theory and kinetic theory of heat.
5.2 Explain the mechanical equivalent of heat.
5.3 State and Explain the first law of thermodynamics .
5.4 Explain Isothermal and adiabatic change.
5.5 Explain Specific heat of a gas, Molar specific heat or molar heat capacity.
5.6 Relate between pressure and volume of a gas in adiabatic Change i, e; $PV^\gamma = \text{const.}$
5.7 State and Explain Reversible process and irreversible process.
5.8 State & explain 2nd law of thermodynamics
5.9 Entropy: Definition, unit and significant.
5.10 Explain Change of entropy in a reversible and irreversible process.
5.11 Give an example of increase of entropy in irreversible process.

6. PHOTOMETRY

- 6.1 Define light, medium (transparent, translucent, opaque), luminous & non-luminous bodies, parallel, convergent & divergent of rays.
6.2 Show the travel of light in straight line.
6.3 Define photometry, luminous intensity, luminous flux, brightness and illuminating power.
6.4 Mention relation between luminous intensity & illuminating power.
6.5 Explain inverse square law of light.
6.6 Describe the practical uses of light waves in engineering.

7. REFLECTION OF LIGHT

- 7.1 Define mirror (plane & spherical), image (real & virtual) and magnification of images.
- 7.2 Describe the reflection of light.
- 7.3 State the laws of reflection of light.
- 7.4 Express the verification of laws of reflection.
- 7.5 Define pole, principal axis, center of curvature, radius of curvature, principal focus in case of concave & convex mirrors.
- 7.6 Find the relation between focal length & radius of curvature of a concave & convex mirror.
- 7.7 Express the general equation of concave and convex mirror.

8. REFRACTION OF LIGHT

- 8.1 Define refraction of light Give examples of refraction of light
- 8.2 State the laws of refraction and Express the verification of laws of refraction
- 8.3 Define absolute and relative refractive index and Relate absolute and relative refractive index
- 8.4 Explain the meaning of total internal reflection and critical angle and Relate total internal reflection and critical angle.
- 8.5 Give examples of total internal reflection.
- 8.6 Describe refraction of light through a prism.
- 8.7 Express the deduction of the relation between refractive index, minimum deviation and angle of the prism.
- 8.8 Define lens and mention the kinds of lens.
- 8.9 Identify and List uses of lens.
- 8.10 Express the deduction of the general equation of lens (Concave & convex).

9. ELECTRON, PHOTON AND RADIO-ACTIVITY

- 9.1 Describe Electrical conductivity of gases.
- 9.2 Describe Discharge tube.
- 9.3 Cathode ray : Definition and its properties
- 9.4 X-ray : Definition, properties & uses
- 9.5 Discuss Photo electric effect .
- 9.6 Derive Einstein's photo electric equation
- 9.7 Define and explain radio-activity.
- 9.8 Describe radio-active decay law.
- 9.9 Define half-life and mean-life of radio-active atoms.
- 9.10 Define nuclear fission and fusion.

10. THEORY OF RELATIVITY

- 10.1 Define Space, time and Mass.
- 10.2 Define rest mass.
- 10.3 Express the theory of relativity.
- 10.4 Explain special theory of relativity and its fundamental postulate.
- 10.5 Mention different Kinds of theory of relativity.
- 10.6 The Relativity of Length - Length contraction.
- 10.7 The Relativity of Time – Time dilation.
- 10.8 Deduce Einstein's mass -energy relation

PRACTICAL

1. Compare the operation of common thermometers.
2. Determine the coefficient of linear expansion of a solid by Pullinger's apparatus.
3. Measure the specific heat capacity of various substances.(Brass, steel).
4. Determine the latent heat of fusion of ice.
5. Determine the water equivalent by calorimeter.
6. Compare the luminous intensity of two different light sources.
7. Verify the laws of reflection.
8. Find out the focal length of a concave mirror.
9. Determine the refractive index of a glass Slab.
10. Determine the angle of Minimum deviation and refractive index of a glass prism by using I-D graph.

REFERENCE BOOKS:

1. Higher Secondary Physics – Second Part - by Dr. Shahjahan Tapan
2. A Text Book of Heat and Thermodynamics - by N Subrahmanyam and Brij Lal
3. A Text Book of Optics - by N Subrahmanyam and Brij Lal
4. Higher Secondary Physics -Second Part - by Prof. Golam Hossain Pramanik
5. Higher Secondary Physics -Second Part - by Ishak Nurfungnabi
6. Thermodynamics - by K K Ramalingam

OBJECTIVES

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SHORT DESCRIPTION

DETAIL DESCRIPTION

1. Operate a personal Computer

1.1 Start up a Computer

- 1.1.1 **Peripherals** are checked and connected with system unit
- 1.1.2 Power cords / adapter are connected properly with computer and power outlets socket
- 1.1.3 Computer is switched on gently.
- 1.1.4 PC **desktop / GUI settings** are arranged and customized as per requirement.

1.2 Operate Computer

- 1.2.1 Files and folders are created.
- 1.2.2 Files and folders are **manipulated** as per requirement.
- 1.2.3 Properties of files and folders are viewed and searched.
- 1.2.4 Control panel settings are practiced.
- 1.2.5 **Memory devices** are formatted as per requirement.

1.3 Shutdown computer

- 1.3.1 unsaved file and folders are closed
- 1.3.2 Open software is closed and hardware devices are switched off.
- 1.3.3 Computer is switched off gently.
- 1.3.4 Power at the respective power outlets is switched off.

2. Type text and documents in English and Bangla.

2.1 Install the Typing Tutor software

- 2.1.1 Required **Hardware** and **software** are ready to use.
- 2.1.2 Typing tutor software are collected and selected
- 2.1.3 English Typing tutor software is installed.
- 2.1.4 Specialized Bangla Typing tutor software is installed.

2.2 Practice text typing in English and Bangla

- 2.2.1 Typing tutor software is started.
- 2.2.2 English Home key drilling are practiced systematically
- 2.2.3 Intermediate level typing speed(25 cps) are achieved.
- 2.2.4 Specialized Bangla Typing tutor / software are installed.
- 2.2.5 Bangla Home key typing are practiced systematically
- 2.2.6 Text documents are typed repeatedly for increasing typing speed.

2.3 Type documents

- 2.3.1 **Word processor** is started.
- 2.3.2 Text document are typed.
- 2.3.3 Intermediate level typing speed (30 cps) in English and (20 cps) in Bangla are achieved.

3. Operate Word Processing Application

3.1 Create documents:

- 3.1.1 Word-processing application are opened.

- 3.1.2 **Documents** are created.
- 3.1.3 Data are added according to information requirements.
- 3.1.4 Document templates Used as required.
- 3.1.5 Formatting tools are used when creating the document.
- 3.1.6 Documents are Saved to directory.

3.2 Customize basic settings to meet page layout conventions:

- 3.2.1 Adjust page layout to meet information requirements
- 3.2.2 Open and view different toolbars
- 3.2.3 Change **font format** to suit the purpose of the document
- 3.2.4 Change alignment and line spacing according to document information requirements
- 3.2.5 Modify margins to suit the purpose of the document
- 3.2.6 Open and switch between several documents

3.3 Format documents

- 3.3.1 Use formatting features and styles as required.
- 3.3.2 Highlight and copy text from another area in the document or from another active document
- 3.3.3 Insert headers and footers to incorporate necessary data
- 3.3.4 Save document in another **file format**
- 3.3.5 Save and close document to **a storage device**.

3.4 Create tables:

- 3.4.1 Insert standard table into document
- 3.4.2 Change cells to meet information requirements
- 3.4.3 Insert and delete columns and rows as necessary
- 3.4.4 Use formatting tools according to style requirements

3.5 Add images:

- 3.5.1 Insert appropriate **images** into document and customize as necessary
- 3.5.2 Position and resize images to meet document formatting needs

3.6 Print information and Shutdown computer:

- 3.6.1 **Printer** is connected with computer and power outlet properly.
- 3.6.2 Power is switched on at both the power outlet and printer.
- 3.6.3 Printer is installed and added.
- 3.6.4 Correct printer settings are selected and document is printed.
- 3.6.5 Print from the printer spool is viewed or cancelled and
- 3.6.6 Unsaved data is saved as per requirements.
- 3.6.7 Open software is closed and computer hardware devices are shut downed.
- 3.6.8 Power at the respective power outlets is switched off.

4. Operate Spreadsheet application

4.1 Create spreadsheets

- 4.1.1 Open spreadsheet application,
- 4.1.2 create spreadsheet files and enter numbers, text and symbols into cells according to information requirements
- 4.1.3 Enter **simple formulas and functions** using cell referencing where required
- 4.1.4 Correct formulas when error messages occur
- 4.1.5 Use a range of common tools during spreadsheet development
- 4.1.6 Edit columns and rows within the spreadsheet
- 4.1.7 Use the auto-fill function to increment data where required
- 4.1.8 Save spreadsheet to directory or folder

4.2 Customize basic settings:

- 4.2.1 Adjust page layout to meet user requirements or special needs
- 4.2.2 Open and view different toolbars
- 4.2.3 Change font settings so that they are appropriate for the purpose of the document
- 4.2.4 Change **alignment** options and line spacing according to spreadsheet **formatting features**
- 4.2.5 **Format** cell to display different styles as required
- 4.2.6 Modify margin sizes to suit the purpose of the spreadsheets

4.2.7 View multiple spreadsheets concurrently

4.3 Format spreadsheet:

4.3.1 Use formatting features as required

4.3.2 Copy selected formatting features from another cell in the spreadsheet or from another active spreadsheet

4.3.3 Use **formatting tools** as required within the spreadsheet

4.3.4 Align information in a selected cell as required

4.3.5 Insert headers and footers using formatting features

4.3.6 Save spreadsheet in another format

4.3.7 Save and close spreadsheet to **storage device**

4.4 Incorporate object and chart in spreadsheet:

4.4.1 Import an object into an active spreadsheet

4.4.2 Manipulate imported **object** by using formatting features

4.4.3 Create a chart using selected data in the spreadsheet

4.4.4 Display selected data in a different chart

4.4.5 Modify chart using formatting features

4.5 Create worksheets and charts

4.5.1 Worksheets are created as per requirement

4.5.2 Data are *entered*

4.5.3 **Functions** are used for calculating and editing logical operation

4.5.4 **Sheets** are formatted as per requirement.

4.5.5 **Charts** are created.

4.5.6 Charts/ Sheets are previewed.

4.6 Print spreadsheet:

4.6.1 Preview spreadsheet in print preview mode

4.6.2 Select basic printer options

4.6.3 Print spreadsheet or selected part of spreadsheet

4.6.4 Submit the spreadsheet to **appropriate person** for approval or feedback

5. Operate Presentation Package:

5.1 Create presentations:

5.1.1 Open a presentation package application and create a simple design for a presentation according to organizational requirements

5.1.2 Open a blank presentation and add text and graphics

5.1.3 Apply existing styles within a presentation

5.1.4 Use presentation template and slides to create a presentation

5.1.5 Use various **illustrations** and **effects** in presentation

5.1.6 Save presentation to correct directory

5.2 Customize basic settings:

5.2.1 Adjust display to meet user requirements

5.2.2 Open and view different **toolbars** to view options

5.2.3 Ensure **font settings** are appropriate for the purpose of the presentation

5.2.4 View multiple slides at once

5.3 Format presentation:

5.3.1 Use and incorporate organizational charts, bulleted lists and modify as required

5.3.2 Add **objects** and manipulate to meet presentation purposes

5.3.3 Import **objects** and modify for presentation purposes

5.3.4 Modify slide layout, including text and colors to meet presentation requirements

5.3.5 Use **formatting tools** as required within the presentation

5.3.6 Duplicate slides within and/or across a presentation

5.3.7 Reorder the sequence of slides and/or delete slides for presentation purposes

5.3.8 Save presentation in another **format**

5.3.9 Save and close presentation to disk

5.4 Add slide show effects:

- 5.4.1 Incorporate preset animation and multimedia effects into presentation as required to enhance the presentation
- 5.4.2 Add slide transition effects to presentation to ensure smooth progression through the presentation
- 5.4.3 Test presentation for overall impact
- 5.4.4 Use onscreen navigation tools to start and stop slide show or move between different slides as required

5.5 Print presentation and notes:

- 5.5.1 Select appropriate print format for presentation
- 5.5.2 Select preferred slide orientation
- 5.5.3 Add notes and slide numbers
- 5.5.4 Preview slides and spell check before presentation
- 5.5.5 Print the selected slides and submit presentation to appropriate person for feedback

6. Access Information using Internet and electronic mail

- 6.1 Access resources from internet
 - 6.1.1 Appropriate internet **browsers** are selected and installed
 - 6.1.2 Internet browser is opened and web address / URL is written/selected in /from address bar to access **information**.
 - 6.1.3 **Search engines** are used to access information
 - 6.1.4 Video / Information are Shared /downloaded / uploaded from / to web site/**social media**.
 - 6.1.5 **Web based resources** are used.
 - 6.1.6 Netiquette' (or web etiquette) principles are searched and followed

6.2 Use and manage Electronic mail

- 6.2.1 **Email services** are identified and selected to create a new email address
- 6.2.2 Email account is created
- 6.2.3 Document is prepared, attached and sent to different types of recipient.
- 6.2.4 Email is read, forwarded, replied and deleted as per requirement.
- 6.2.5 Custom email folders are created and **manipulated**
- 6.2.6 Email message is printed