Civil Technology (64) 3rd Semester

SI.	Subject	Name of the subject	Т	P C		MARKS				
No	couc				Theory		Practical		Total	
						Cont.	Final	Cont.	Final	
						assess	exam.	assess	exam.	
1	6431	Civil Engineering drawing (CAD)-1	1	6	3	10	40	50	50	150
2	6432	Surveying-1	2	6	4	20	80	50	50	200
3	6433	Structural Mechanics	3	3	4	30	120	25	25	200
4	5931	Mathematics3	3	3	4	30	120	50	-	200
5	5913	Chemistry	3	3	4	30	120	25	25	200
6	5821	Social Science-2	2	0	2	20	80	-	-	100
7	5812	Physical Education and Life Skill Development	0	2	1	-	-	25	25	50
		Total	14	23	22	140	560	225	175	1100

Civil Technology (64) 4th Semester

SI.	Subject	Name of the subject	Т	Р	С	MARKS				
No	code					The	ory	Practi	cal	Total
						Cont. assess	Final exam.	Cont. assess	Final exam.	
1	6443	Surveying-2	2	6	4	20	80	50	50	200
2	6442	Estimating & Costing-1	3	3	4	30	120	25	25	200
3	6441	Geotechnical Engg.	2	3	3	20	80	25	25	150
4	6444	Construction Process-1	3	3	4	30	120	25	25	200
5	6445	Hydraulic	3	3	4	30	120	25	25	200
6	6632	Computer Application-2	0	6	2	-	-	50	50	100
7	5841	Business Organization & Communication	2	0	2	20	80	-	-	100
		Total	15	24	23	150	600	200	200	1150

6443

Η	Ρ	С
2	6	4

AIMS

- able to use level, theodoliteand tachometer
- able to conduct leveling work.
- To perform ability to conduct traversing with theodolite.
- To perform ability to determine horizontal and vertical distances of inaccessible points.

SHORT DESCRIPTION

Leveling; Contouring; Theodolite surveying; Traversing, Tachometric surveying, and Topographic surveying,

DETAIL DESCRIPTION

C)

e)

g) i)

e)

5

Theory :

1 Understand the concept of leveling.

- Define Level and Leveling 1.1
- 1.2 Describe the purpose of leveling.
- 1.3 State the term surface.
- 1.4 Explain the following terms in leveling :
 - Level surface a)
 - Horizontal surface d)
 - Vertical line f)
 - h) Datum

b)

- Datum surface Reduced level
- j) Formation level

2 Understand the application of bench mark (BM).

Vertical plane

- State the meaning of bench mark. 2.1
- 2.2 Mention the classification of bench marks.
- 2.3 Describe different types of bench mark.

3 Understand the features of leveling instruments.

- List the equipment and accessories required for leveling. 3.1
- 3.2 Identify the different types of level.
- 3.3 Label the different parts of a level.
- Explain the following terms related to leveling: 3.4 Axis of telescope
 - Line of collimation a)
 - C) Axis of bubble tube
 - d) Height of instrument f)
 - h)
 - Focussing g)

4 Understand the application of leveling staff.

- 4.1 Mention the purposes of leveling staff.
- 4.2 Identify different types of leveling staff.
- 4.3 Mention the procedure of taking staff reading with the help of sopwith staff and meter staff.
- Identify the positions of setting up leveling instruments. 4.4
- Mention the procedure of holding a leveling staff. 4.5
- 4.6 Mention the procedure of taking staff reading.
- Understand the adjustment of leveling instrument.
 - State the meaning of adjustment of leveling instruments. 5.1
 - 5.2 Mention different kinds of adjustments of level.
 - 5.3 State the different steps of temporary adjustment.
 - Identify the fundamental lines of leveling instrument. 5.4
 - Mention the relations among the fundamental lines. 5.5
 - Identify the permanent adjustments of auto set and digital level. 5.6
 - Solve problems on permanent adjustments of levels. 5.7

Plane of collimation

Vertical axis

Parallax

- Level line b) Horizontal line

6 Understand booking of staff reading and reduction of level.

- 6.1 Explain the meaning of following terms as used in leveling:
 - a) Back sight, foresight and intermediate sight reading
 - b) Change point
 - c) Station
- 6.2 State the necessity of level book or field book.
- 6.3 Identify different kinds of level book or field book.
- 6.4 Describe the term reduction of leveling.
- 6.5 Mention the procedure of booking of staff reading into level book.
- 6.6 Compare different methods of reduction of leveling.
- 6.7 Solve problems on reduction of leveling.
- 6.8 Solve problems on calculation of missing data of old level book.

7 Understand various classification of leveling.

- 7.1 List different kinds of leveling :
- 7.2 Identify the different kinds of leveling.
- 7.3 Describe the procedure of fly leveling, profile leveling, cross sectioning and check leveling.
- 7.4 Solve different problems on fly leveling, profile leveling, cross sectioning and check leveling.
- 7.5 Sate the purposes of reciprocal leveling.
- 7.6 Describe the procedure of reciprocal leveling.
- 7.7 Solve problems on reciprocal leveling.

8 Understand the aspects of plotting level sections.

- 8.1 State the meaning of longitudinal profile and cross profile of a leveling work.
- 8.2 Mention the purposes of plotting long section and cross section of leveling works.
- 8.3 Explain the various elements of longitudinal section and cross section of leveling works.
- 8.4 Describe the procedure of plotting long and cross-section.
- 8.5 Prepare longitudinal profile and cross profile from given data.

9 Understand the difficulties and errors in leveling.

- 9.1 Identify difficulties in leveling.
- 9.2 Mention the procedure of leveling in the following cases :
 - a) Ascending and descending a hill.
 - b) Staff too near the level.
 - c) Staff too low or too high.
 - d) Staff station above the line of collimation.
 - e) Board fence on the alignment.
 - f) Wall on the alignment.
- 9.3 List the instrumental and personal errors in leveling.
- 9.4 Explain the effects of earth's curvature and refraction of light on leveling.
- 9.5 Deduce the formula for earth curvature and refraction of light.
- 9.6 Solve problems on errors due to curvature and refraction.
- 9.7 Deduce the formula for distance to the visible horizon
 - and dip of the horizon.
- 9.8 Solve problems on visible horizon and dip of the horizon.
- 9.9 List the common mistakes in leveling.
- 9.10 Specify the magnitude and permissible limits of closing error in leveling.

10 Understand the aspects of contouring.

10.1 Explain the terms contour, contouring, horizontal equivalent and vertical

interval.

- 10.2 Mention the characteristics of contour.
- 10.3 List the uses of contour.
- 10.4 Mention the different methods of contouring .

- 10.5 State the procedure of different methods of contouring.
- 10.6 Explain interpolation of contour by estimation method only.
- 10.7 Mention the procedure of drawing contour map.
- 10.8 Draw contour maps of hill, reservoir, valley etc.

11 Understand the application of contour maps.

- 11.1 Identify the various uses of contour map.
- 11.2 State the procedure of locating the proposed route for a road, canal and
 - drainage work.
- 11.3 Calculate the capacity of reservoir using contour map.
- 11.4 Calculate the quantity of earth in cutting and in filling by using contour map.

12 Understand the fundamentals of theodolite.

- 12.1 Distinguish between a transit and non-transit theodolite.
- 12.2 Identify the common parts of a transit (digital) theodolite.
- 12.3 Mention the functions of different parts of a transit (digital) theodolite.
- 12.4 State the meaning of diaphragm, lense, spherical aberration, chromatic aberration, centering and transiting, display board

13 Understand the adjustment of transit(digital) theodolite .

- 13.1 Identify the different types of adjustment.
- 13.2 Explain the significance of temporary adjustment.
- 13.3 State different steps of temporary adjustment of theodolite.
- 13.4 Identify the fundamental lines of transit(digital) theodolite.
- 13.5 Mention the relations among the fundamental lines.
- 13.6 Identify the permanent adjustments of transit(digital) theodolite.

14 Understand the principles of measuring angles and bearing with theodolite.

- 14.1 Mention the procedure of measuring horizontal angles.
- 14.2 Mention the procedure of measuring vertical angles.
- 14.3 Mention the procedure of measuring magnetic bearing of a line.

14.4 Mention the procedure of determining true bearing of a line by observing

pole star.

15 Understand the application of trigonometrical leveling.

15.1 Explain the basic principle of trigonometrical leveling.

15.2 Describe the method of measuring height when the object is accessible.

15.3 Express the deduction of the formula for measuring height and horizontal

distance when the object is inaccessible in the case of object and the station are in different vertical plane and in different levels.

- 15.4 Express the deduction of the formula for measuring height and horizontal distance when the object is inaccessible in the case of object and the station are in different vertical plane and in different levels.
- 15.5 Solve problems on finding heights and distances.

16 Understand the principles of traverse survey.

- 16.1 Explain the meaning of traverse.
- 16.2 List the field works in theodolite traversing.
- 16.3 Describe the traversing by methods of included angles and direct angle.
- 16.4 Explain the term checking of traverse.

17 Apply the concept of plotting a traverse.

- 17.1 Explain the process of plotting a traverse.
- 17.2 Calculate the bearing from angles of traverse.
- 17.3 Compute the coordinates of a traverse.
- 17.4 Describe the Bowditch's rule and Transit rule.
- 17.5 Define Balancing of closed traverse.

18 Understand the concept of traverse in solving problems.

18.1 Describe different types of problems in traversing.

18.2 Calculate the length and bearing of a missing side and any included angle

of a traverse.

18.3 Compute the area of closed traverse by coordinate, latitude and double

meridian, departure and total latitude methods.

19 Understand the sources of errors in theodolite traversing.

- 19.1 Identify the sources of errors in theodolite work.
- 19.2 List the common mistakes in theodolite work.
- 19.3 Explain the way to avoid errors & mistakes in theodolite work.

20 Understand the principle of stadia or tachometric surveying.

- 20.1 State the meaning of stadia surveying.
- 20.2 Mention the necessity of stadia surveying.
- 20.3 Identify the instruments required for stadia surveying.
- 20.4 Express the derivation of the formula based on the principle of stadia surveying.
- 20.5 Explain the effect of anallatic lense.
- 20.6 Explain the methods of determining the tachometric constants.

21 Understand the concept of angular tachometry.

21.1 Describe angular tachometry.

21.2 Express the derivation of the formula to determine the horizontal distance

and elevation when the staff is held in vertical position for both upward and downward sights.

21.3 Express the derivation of the formula to determine the horizontal distance

and elevation when the staff is held perpendicular to the line of sight

- for
 - both upward and downward sights.
- 21.4 Describe the procedure of stadia surveying.
- 21.5 Solve problems on stadia surveying.

22 Understand the concept of topographic surveying.

- 22.1 State the meaning of topographic survey and the relief.
 - 22.2 Explain the methods of representation of relief.
 - 22.3 Mention the procedure of topographic survey.
 - 22.4 Explain the method of locating horizontal and vertical control.
 - 22.5 Explain the method of locating contours.
 - 22.6 Explain the method of locating details.
 - 22.7 Describe the procedure of plotting a topographic map.

Practical :

- 1 Demonstrate the components of level.
- 2 Perform temporary adjustments of level.

- 3 Conduct fly leveling.
- 4 Conduct profile leveling, cross-sectioning and plot level sections.
- 5 Conduct reciprocal leveling.
- 6 Conduct check leveling.
- 7 Conduct contouring by direct method over a low lying/elevated area, prepare contour map and calculate the quantity of earth work in filling/cutting.
- 8 Determine horizontal angle using a transit(digital) theodolite.
- 9 Determine vertical angle using a transit(digital) theodolite.
- 10 Determine height and distance of a tower using a transit(digital) theodolite.
- 11 Conduct traversing with a theodolite and plot maps including computation of area.
- 12 Determine the tachometeric constant experimentally.
- 13 Determine horizontal and vertical distances with tachometer.

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14 Determine horizontal and vertical distances with modern level fitted with stadia.

REFERENCE BOOKS

- 1 Surveying
- 2 Surveying & Leveling
- 3 Surveying
- 4 Plane & Geodetic survey
- Aziz and Shahjahan
- T P Kanetker
- Norman Thomas
- D Clark

T P C 3 3 4

AIMS

To provide the ability of quantity analysis of civil engineering works

- To enable to estimate volume quantites of materials used in construction works
- To provide understanding cost abstruct of civil engineering works
- To be able to improve knowledge and skill of estimating two storied building consisting of spread footing .
- To develop skill in estimating RCC and bituminous road .
- To develop skill in rate analysis process for different items of work in the building trades.

SHORT DESCRIPTION

Introduction to estimating ,Quantity estimation of excavating tank, road embankment canal digging , steps, boundary wall, bituminous & Rcc road, Complete estimate of a single storied two- roomed building with verandah and Two storied building with verandah,. Rate analysis.

DETAIL DESCRIPTION

Theory

INTRODUCTION TO ESTIMATING

1 Understand the basic concept of estimating .

- 1.1 Define the term estimating .
- 1.2 State the methods of estimating .
- 1.3 Mention the rules and methods of measurements of works.
- 1.4 Mention the rules of deduction for opening, bearing etc. in masonry .
- 1.5 List unit weight of different materials used in construction works

1.6 Write unit of different items of works as per standard practice.

QUANTITY ESTIMATION

2 Estimate the volume of earth work for excavating a tank

2.1 Mention the rules of finding out the volume of earth work by mid area method.

2.2 Mention the rules of finding out the volume of earth work by mean area method.

2.3 Mention the rules of finding out the volume of earth work by prismoidal method.

3 Estimate the volume of earth work for road embankment.

- 3.1 Identify the side slopes for different heights of road embankment.
- 3.2 Identify the cross section of road embankment.
- 3.3 State the method of finding out the volume of earth work in embankment by mid area method..
- 3.4 State the method of finding out the volume of earth work in embankment by mean area method..
- 3.5 State the method of finding out the volume of earth work in embankment

by prismoidal method.

4 Estimate the volume of earth work for canal digging.

- 4.1 Identify the cross section of partly banking and partly cutting.
- 4.2 .Explain the method of finding out volume of earth work for partly banking and partly cutting.
- 4.3 .Explain the terms lead and lift.
- 5 Estimate the different quantities of item of work in steps , boundary wall and roads.
 - 5.1 Identify different parts of a steps .
 - 5.2 List different items of works in a boundary wall .
 - 5.3 List different items of works in a bituminous road .
 - 5.4 List different items of works in a RCC road.

COMPLETE ESTIMATE OF A SINGLE STORIED TWO ROOMED BUILDING WITH VERANDAH AND TWO STORIED BUILDING WITH VERANDAH.

6 Understand the procedure of estimating a simple building.

- 6.1 State centre line and separate wall method.
- 6.2 Mention the advantage and disadvantage of centre line and separate wall methods.
- 6.3 Explain the methods of deduction for opening or over lapping.
- 6.4 Define the terms sub-structure and super- structure.
- 6.5 .Explain the dimensions length, breadth and height or depth of any section.
- 6.6 Identify main wall, partition wall, outer wall, inner wall, parapet wall etc.
- 6.7 Identify RCC work in lintel, beam, stair, floor/roof slab, sunshade, shelve, railing, drop wall etc.
- 6.8 .List different sizes of doors and windows.
- 6.9 List the number of ventilators required.
- 6.10 Identify the items of work for civil construction.

RATE ANALYSIS

7 Understand the basic concept of rate analysis.

- 7.1 State meaning of rate analysis. .
- 7.2 Explain the purposes of rate analysis.
- 7.3 Explain the terms, contractors profit, overhead charges, contingency sundries and lumsum.
- 7.4 Mention the advantage of rate analysis to prepare cost estimate .

PRACTICAL

- 1. Calculate the volume of earth work in excavating tank of a given cross-section by mid area method.
- 2.Calculate the volume of earth work in excavating tank of a given cross-section by mean area method.
- 3. Calculate the volume of earth work in excavating tank of a given cross-section by prismoidal method.
- 4. Calculate the volume of earth work of 100m long embankment by mid area method.
- 5. Calculate the volume of earth work of 100m long embankment by mean area method..
- 6. Calculate the volume of earth work of 100m long embankment by prismoidal method.
- 7. Determine the rate of different categories of labour cosidering the work site including lead and lift.
- 8. Calculate the cost of abstruct considering labour categories and lead & lifts.

- 9. Calculate the volume of earth work for partly banking and partly cutting.
- 10. Calculate the amount of cement ,sand and brick required for 10 cum masonry work using 1:4 proportion of mortar.
- 11. Calculate the amount of cement ,sand and brick required for 10 cum masonry work using 1:6 proportion of mortar.
- 12. Calculate the amount of cement ,sand and brick required for 10 sqm brick masonry (125mm thick wall) using 1:4 proportion mortar.
- 13. Prepare an estimate for construction of underground water reservior.
- 14. Prepare an estimate for construction of 100m long boundary wall.
- 15. Prepare an estimate for making wooden chair, table and almirah.
- 16. Prepare an estimate for construction of 100m long bituminous road.

17.Prepare an estimate for construction of 100m long RCC road.

Calculate the quantity of following items of work of a single storied two-

18 roomed building with verandah and two storied building with verandah.

- 18.1 Earth work in excavation of foundation trenches.
- 18.2 One layer brick flat soling in foundation and floor.
- 18.3 Cement concrete work (1:3:6) in foundation and floor.
- 18.4 Brick work(1:6) in foundation (Sub-structure) up to plinth level.
- 18.5 Earth work in filling the sides of foundation trenches and plinth.
- 18.6 Damp proof course (DPC) below super structure wall.
- 18.7 Brick work (1:6) in super structure .
- 18.8 125 mm thick Brick work (1:4) in partition wall .
- 18.9 RCC work (1:2:4) in lintel, beams, roof slab, stair, sunshade and drop wall.
- 18.10 Mild steel bar reinforcement fabrication in different RCC works when percentage given .
- 18.11 Wood work in door and window frames.
- 18.12 Wood work in door and window shutters.
- 18.13 Grill work for windows .
- 18.14 Pre-cast RCC ventilator .
- 18.15 Cement plaster to both sides of brick wall .
- 18.16 Cement plaster to all RCC surface .
- 18.17 Cement plaster to plinth wall and skirting with neat cement finishing (NCF) .
- 18.18 Patent stone flooring (PSF)
- 18.19 Lime terracing over RCC roof slab.
- 18.20 White washing/distempering.
- 18.21 Plastic emulsion paint to walls and ceiling.
- 18.22 .Color washing/ snowcem washing/weather coat.
- 18.23 Synthetic enamel painting to doors and windows.

19 Calculate the analysis of rates for different items of building works.

REFERENCE BOOKS

- 1. Estimating and costing B N Datta
- 2. Estimating and costing Gurucharan Singh

AIMS

- To enable to understand of the origin, composition, classification and properties of soil.
- To assist in understanding the plasticity characteristics and hydraulic properties of soil.
- To assist in understanding the consolidation characteristics of soil.
- To assist in understanding the lateral earth pressure of soil.
- To provide understanding of the site investigation and method of sample collection.
- To provide basic field skill for collection of soil sample.
- To provide basic laboratory skill required to determine soil properties and to perform the relevant calculations.

SHORT DESCRIPTION

Introduction to geotechnic ; Preliminary definition and simple tests; Particle size of soil; Plasticity characteristic of soil; Hydraulic properties of soil; Consolidation characteristics of soil; Subsurface investigation; Lateral earth pressure; Bearing capacity of soil.

DETAIL DESCRIPTION

Theory :

INTRODUCTION TO GEOTECHNIC

1. Understand the basic concept of geotechnic.

- 1.1 Define rock, soil and soil engineering.
- 1.2 Describe origin and formation of soil.
- 1.3 Describe historical origin and formation of soil of Bangladesh.
- 1.4 Explain limitation of soil engineering.
- 1.5 Mention the soil classification system.
- 1.6 State textural, AASHO and unified ASTM system.
- State field identification test such as; dilatancy, toughness, dry strength test.
- 1.8 List general properties of soil.

PRELIMINARY DEFINITION AND SIMPLE TESTS

2. Understand preliminary definitions and simple test soil.

- 2.1 Define the following terms: void ratio, porosity, degree of saturation, percentage of air voids, air content, water content, bulk unit wt, dry unit wt, saturated unit wt, submerged unit wt, unit wt. of solids, specific gravity of solids, density index.
- 2.2 Explain three-phase diagram in terms of void ratio.
- 2.3 Explain three-phase diagram in terms of porosity.
- 2.4 Solve problems on soil properties.
- 2.5 Explain oven drying method of water content determination.
- 2.6 Explain specific gravity determination by pycnometer method.

PARTICLE SIZE OF SOIL

3. Understand the particle size of soil.

- 3.1 Define index properties of soil.
- 3.2 State mechanical analysis of soil.
- 3.3 Describe sieve analysis.
- 3.4 Mention and derive stokes law.
- 3.5 Describe particles size analysis by hydrometer.

PLASTICITY CHARACTERISTICS OF SOIL

4. Understand the plasticity characteristics of soil.

- 4.1 Define: plasticity of soil, Atterberg limit, liquid limit, plastic limit, shrinkage limit, plasticity index, liquidity index, consistency index, flow index and toughness index.
- 4.2 State the method of measurement of consistency.
- 4.3 Define the terms: sensitivity and thixotropy.
- 4.4 List the uses of consistency (Atterberg) limits.

HYDRAULIC PROPERTIES OF SOIL

5. Understand the hydraulic properties of soil.

- 5.1 Define the following: Permeability of soil, hydraulic head, piezometric head, position head and Darcy's law.
- 5.2 State the meaning of constant head and variable head permeability test for determination of co-efficient of permeability.

- 5.3 Describe the pumping out tests for determination of coefficient of permeability.
- 5.4 Compute effective pressure and pore water pressure.
- 5.5 List the factors affecting permeability of soil.
- 5.6 Define seepage pressure, seepage velocity, equipotential line and flow net.

CONSOLIDATION CHARACTERISTICS OF SOIL

- 6. Understand the consolidation characteristics of soil.
 - 6.1 Define consolidation and initial, primary and secondary consolidation.
 - 6.2 State behavior of saturated soil under pressure.
 - 6.3 Draw consolidation characteristics of preloaded deposits.
 - 6.4 Identify triaxial compression test apparatus.
 - 6.5 Interpret the results of triaxial tests.
 - 6.6 Explain unconfined and confined compression test.
 - 6.7 Differentiate between consolidation and compaction.
 - 6.8 State standard proctor test of compaction and standard proctor moisture density curve for material.

SUBSURFACE INVESTIGATION

7. Understand the purpose of subsurface investigation.

- 7.1 State the meaning of subsurface investigation of soil.
- 7.2 Mention the stages in subsurface explorations.
- 7.3 Mention the purposes of subsurface investigation of soil.

- 7.4 Compute the depth and lateral extent of explorations.
- 7.5 Describe the open excavation methods of explorations.
- 7.6 Describe auger boring, wash boring, rotary drilling, percussion drilling and core boring.
- 7.7 Identify various types of soil samples.
- 7.8 Identify split barrel sampler, spring core catches, scraper bucket and piston sampler for collecting samples.
- 7.9 Describe the method of standard penetration test.
- 7.10 State the procedure of writing subsoil investigation report.

LATERAL EARTH PRESSURE

8. Understand the aspect of lateral earth pressure.

- 8.1 State the meaning of at-rest pressure, active earth pressure and passive earth pressure.
- 8.2 explain active and passive earth pressure of Rankine's theory with non-surcharge.
- 8.3 State the formula of active earth pressure of Rankine's theory with surcharge.
- 8.4 State the fundamental assumptions of Coulomb's wedge theory.
- 8.5 State the formula of active earth pressure of Coulomb's theory with surcharge.

BEARING CAPACITY OF SOIL

9. Understand the bearing capacity of soil.

- 9.1 Define bearing capacity of soil.
- 9.2 Correlate between penetration resistance and unconfined compressive strength for cohesive soil.
- 9.3 Correlate between penetration resistance and angle of shearing resistance for cohesion less soil.
- 9.4 Explain the bearing capacity from Standard Penetration Test (SPT).
- 9.5 List the causes of foundation settlement.

Practical:

- 1. Determine the water content of soil by oven drying method.
- 2. Determine the specific gravity of soil by pycnometer method.
- 3. Determine the particle size of soil by sieve analysis.
- 4. Determine the particle size of soil by hydrometer analysis.
- 5. Determine the liquid limit of soil by casagrand's apparatus.
- 6. Determine the plastic limit of soil.
- Determine the co-efficient of permeability of soil by constant head test.
- 8. Collect the sample of soil by wash boring method.
- Determine the bearing capacity of soil from Standard Penetration Test (SPT).
- 10. Determine the amount of compaction and the water content by standard proctor test.
- 11. Determine the shear characteristics of soil by unconfined compression test.
- 12. Perform the consolidation test.

REFERENCE BOOKS

1	Foundation Engineering						
	-	Ralph B Peck, Walter, E					
	Hanson						
2	Soli Mechanics and Foundation Engineering						
	-	Dr. K. R. Arora.					
3.	Soil Mechanics and Foundation						
	-	Dr. B. C. Punmia.					
4	Foundation Analysis and Design						
	-	Josef and Vawels.					

CONSTRUCTION PROCESS-I T P C

6444

3 3 4

AIMS

- To apply relevant theory and practice of concrete construction and its quality control methods.
- To provide understanding and skills for construction and supervision of all type of foundations.
- To assist on understanding the process, techniques and materials used in different types of masonry.

SHORT DESCRIPTION

Concrete, Foundation, Shallow foundation, Deep foundation, Brick masonry, Composite masonry, Partition wall, Cavity wall.

DETAIL DESCRIPTION

<u>Theory</u>:

1 Understand the features of concrete.

- 1.1 State the meaning of concrete.
- 1.2 Mention the different kinds of concrete.
- 1.3 List the uses of concrete in the construction industry.
- 1.4 List the ingredients of different kinds of concrete.
- 1.5 Mention the functions of ingredients of concrete.
- 1.6 Mention the advantages and limitations of concrete.
- 1.7 Write the characteristics of materials used in concrete.

2 Understand the properties of concrete.

- 2.1 Define the terms: strength, durability, workability, laitance and segregation.
- 2.2 State the meaning of water-cement ratio.
- 2.3 List the factors affecting the strength of concrete.
- 2.4 List the factors affecting the durability of concrete.
- 2.5 List the factors affecting the workability of concrete.
- 2.6 Describe the affect of water-cement ratio on the strength of concrete.

3 Understand the techniques of proportioning, mixing, transporting, placing and compaction of concrete.

- 3.1 Explain the significance of proportioning the ingredients of concrete.
- 3.2 List the methods of concrete mix design.

- 3.3 Describe how batching of concrete mix is achieved by volume and weight.
- 3.4 Compare the various processes used to mix concrete.
- 3.5 Mention the advantages and limitations of ready mix concrete.
- 3.6 State the various methods of transporting concrete.
- 3.7 Mention the sequence of placing concrete in different situations.
- 3.8 Describe the processes of compaction of concrete.

4 Understand the concept of curing concrete.

- 4.1 State the meaning of curing.
- 4.2 State how the curing process affects the strength of hardened concrete.
- 4.3 Describe the different methods of curing.
- 4.4 Mention the advantages and limitations of various methods of curing.

5 Understand the need of different tests on concrete.

- 5.1 Interpret standard test information to establish the properties of various types of aggregates.
- 5.2 Express how to draw the grading curve for various sample of aggregate.
- 5.3 Express how to determine the FM value from the grading curve.
- 5.4 State the necessity of the following tests on concrete:
 - a. Slump test.
 - b. Compressive test on hardened cube.
 - c. Compressive test on hardened cylinder.

6 Understand the features of different special types of concrete.

- 6.1 Compare the properties of polymer concrete and super plasticized concrete.
- 6.2 Mention the procedure used in the production of Ferro-cement construction.
- 6.3 Explain the term pre-stressed concrete.
- 6.4 Mention the procedure used in the production of pre-stressed concrete.

7 Understand the supervisory aspects of concrete construction.

- 7.1 List the special precautions to be observed for concreting under water.
- 7.2 List the special precautions to be observed for concreting in cold weather.

- 7.3 List the special precautions to be observed for concreting in hot weather.
- 7.4 List the factors to be considered while supervising good quality concrete production.
- 7.5 List the factors to be considered while supervising good quality RCC construction.
- 7.6 List the factors to be considered while supervising good quality prestressed concrete construction.

8 Understand the aspects of foundation.

- 8.1 Define the term 'foundation'.
- 8.2 State the functions of foundation.
- 8.3 List the essential requirements of a good foundation.
- 8.4 List the common causes of failure of foundations.
- 8.5 Explain the remedial measures necessary to overcome the failure of foundations.
- 8.6 Mention the precautions necessary to prevent uneven settlement of foundations.

9 Understand the features of shallow foundation.

- 9.1 Define the term 'shallow foundation'.
- 9.2 Mention the advantages of shallow foundations.
- 9.3 Mention the limitations of shallow foundations.
- 9.4 Mention the suitability of various types of shallow foundations.
- 9.5 Draw the sketches of strip footing, wide strip footing, eccentrically loaded footing, raft foundation, combined footing, stepped strip foundation, grillage foundation.

10 Understand the features of deep foundation.

- 10.1 Define the term 'deep foundation'.
- 10.2 Mention the classification of pile foundations according to function or use, materials and composition, method of construction.
- 10.3 Write the advantages and limitations in each case of deep foundations.
- 10.4 Describe the following methods of casting and placing concrete pile foundation:
 - a. Cased cast-in-situ concrete pile.
 - b. Uncased cast-in-situ concrete pile.
 - c. Pre-cast concrete pile.
- 10.5 Identify the types of hammers used for pile driving.

10.6 Describe the methods for driving concrete pile groups and placing pile caps.

11 Understand the features of brick masonry.

- 11.1 State the meaning of brick masonry.
- 11.2 List the tools required for brick masonry.
- 11.3 State the specific uses of brick masonry tools.
- 11.4 Distinguish among different types of masonry structures.
- 11.5 Define the following terms: header, stretcher, lap, course, bed, joint, closers, perpend.
- 11.6 Identify the defects in brick masonry.
- 11.7 List the factors to be considered while supervising brick masonry works.

12 Understand the purpose of bond in brick masonry.

- 12.1 State the meaning of bond in brick masonry.
- 12.2 Mention the functions of good brick bonding.
- 12.3 Describe the steps for brick lying.
- 12.4 Identify different types of bonds in brick masonry.
- 12.5 Draw the neat sketches of different types of bonds in brick masonry.
- 12.6 Differentiate between English and Flemish bond.
- 12.7 Describe the bonding arrangements around openings and corners.

13 Understand the features of composite masonry.

- 13.1 State the meaning of composite masonry.
- 13.2 Identify different types of composite masonry.
- 13.3 Sketch details of brick backed stone slab masonry.
- 13.4 Sketch details of reinforced brick masonry.
- 13.5 Mention the advantages and limitations of using reinforced brick masonry.
- 13.6 Mention the advantages and limitations of hollow clay block masonry.

14 Understand the features of partition wall.

- 14.1 State the meaning of partition wall.
- 14.2 Mention the common requirement of partition walls.
- 14.3 Mention the functions of partition wall.
- 14.4 List different types of partition walls.
- 14.5 Describe the procedure of construction of the following types of partition walls:
 - a. Brick partition wall
 - b. Concrete partition wall

- c. Glass partition wall
- d. Aluminum partition wall
- e. Light weight partition wall(timber stud work, Ferro-cement plate, hollow blocks)
- 14.6 Mention the advantages and limitations of each type of partition walls.
- 14.7 Differentiate among the load bearing (main) walls and partition walls.

15 Understand the features of cavity wall.

- 15.1 State the meaning of cavity wall.
- 15.2 Explain the necessity of cavity wall construction.
- 15.3 Sketch the general features of cavity walls.
- 15.4 Mention the advantages and limitations of cavity walls over solid brick walls.
- 15.5 Identify different types of wall ties used in cavity wall.
- 15.6 Determine the spacing of wall ties in used in cavity wall.
- 15.7 Describe the construction procedure of cavity wall.
- 15.8 Mention the precautions to be taken while construction of cavity wall.

Practical:

- 1 Draw the grading curves for various samples of aggregates to find out the FM value.
- 2 Determine the slump for different concrete works.
- 3 Conduct cube test for concrete and interpret the results.
- 4 Conduct cylinder test for concrete and interpret the results.
- 5 Construct sample brick pillars of sizes 25cm x 25cm to 75cm x 75cm with English bond.
- 6 Construct sample brick pillars of sizes 25cm x 25cm to 75cm x 75cm with Flemish bond.
- 7 Construct sample corner (L) joints of 25cm to 75cm width English bond brick wall.
- 8 Construct sample corner (L) joints of 25cm to 75cm width Flemish bond brick wall.
- 9 Construct sample tee (T) joints of 25cm to 75cm width English bond brick wall.
- 10 Construct sample tee (T) joints of 25cm to 75cm width Flemish bond brick wall.

- 11 Construct sample cross (+) joints of 25cm to 75cm width English bond brick wall.
- 12 Construct sample cross (+) joints of 25cm to 75cm width Flemish bond brick wall.

REFERENCE BOOKS

- 1 Building construction Dr. B C Punmia
- 2 Building construction
- 3 Building construction

Brindra

Dr. B C Punmia G J Kulkarni S P Aurora and S P

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AIMS

- To enable to understand the behavior of incompressible fluids.
- To enable to understand the fundamentals of buoyancy.
- To enable to understand flow of liquid in closed system and in open channel.
- To assist in identifying the common measuring instruments / apparatus used in measuring the various parameters of flowing liquid.
- To enable to applying the common measuring instruments / apparatus in measuring the various parameters of flowing liquid.

SHORT DESCRIPTION

Fluid pressure; Buoyancy; Principles of flow of fluid; Flow through orifices and mouthpieces; Losses of head of flowing liquid; Friction and flow through pipes; Flow of liquid through notches and weirs; Flow of liquid through open channel; Measurement of velocity of flow by current-meter and float.

DETAIL DESCRIPTION

Theory :

FLUID AND PRESSURE

1 Understand the basic concept of fluid and its properties.

- 1.1 Define fluid, liquid and gases.
- 1.2 Differentiate fluid, liquid and gases.
- 1.3 Define hydraulics.
- 1.4 Define density, specific weight, surface tension, capillarity and viscosity of liquid.

2 Understand the aspects of fluid pressure.

- 2.1 State the meaning of intensity of pressure.
- 2.2 State the meaning of pressure head and static head of liquid.
- 2.3 Define free surface of liquid, atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure.
- 2.4 Compute the intensity of pressure and total pressure at the base / side wall of a tank full of water.
- 2.5 Identify hydraulic ram and plunger.
- 2.6 Explain the working principle of a hydraulic ram.
- 2.7 Calculate the weight lifting capacity of ram.

3 Understand the technique of measuring the fluid pressure.

- 3.1 Define piezometer, manometer, differential manometer and inverted differential manometer
- 3.2 Outline the specific uses and limitations of each of the fluid pressure measuring devices in 3.1.
- 3.3 Compute liquid pressure using piezometer.
- 3.4 Compute liquid pressure using simple manometer.
- 3.5 Compute difference of fluid pressure between two sections of a pipe line using differential manometer.
- 3.6 Compute difference of fluid pressure between two sections of a pipe line using inverted differential manometer.
- 4 Understand the concept of total pressure and center of pressure on immerged plane surface.
- 4.1 Explain the meaning of total pressure and center of pressure on an immerged plane surface.
- 4.2 Express the deduction of formula for computing total pressure on a vertically immerged plane surface.
- 4.3 Express the deduction of formula for computing center of pressure on a vertically immerged plane surface
- 4.4 Compute total pressure on a vertically immerged plane surface.
- 4.5 Compute center of pressure of liquid on a vertically immerged plane surface

BUOYANCY

5 Understand the fundamental concepts of buoyancy.

- 5.1 Define buoyancy and center of buoyancy.
- 5.2 State the meaning of metacentre and metacentric height.
- 5.3 Mention the conditions of equilibrium of a floating body.

5.4 Compute the metacentric height using experimental formula

PRINCIPLES OF FLOW OF FLUID

6 Understand the principles of flow of liquid under different conditions.

- 6.1 Define various types of flow such as: laminar flow, turbulent flow, steady flow, unsteady flow, uniform flow, non-uniform flow, incompressible flow, rotational flow, irrotational flow, continuous flow.
- 6.2 Explain the term discharge.
- 6.3 State the equation of continuity of liquid flow.
- 6.4 Explain datum head, velocity head, pressure head and total head of a liquid.

7 Understand the concept of Bernoulli's theorem.

7.1 State the Bernoulli's theorem.

- 7.2 Prove the Bernoulli's theorem.
- 7.3 Describe construction of venturimeter and pitot tube.
- 7.4 Compute the discharge in a given pipe line by using venturimeter.

7.5 Compute velocity and discharge in a section of a flowing liquid by using a pitot tube.

FLOW THROUGH ORIFICES AND MOUTHPIECES

8 Understand the aspects of flow through orifice and mouthpiece.

- 8.1 Define the terms: orifice, jet of water and venacontracta.
- 8.2 State the meaning of coefficient of contraction (Cc), coefficient of velocity (Cv), coefficient of discharge (Cd).
- 8.3 State the relation between Cc, Cv and Cd.
- 8.4 Calculate the time of emptying a rectangular tank and hemispherical vessel through orifice.
- 8.5 Define the term mouthpiece.
- 8.6 Explain the functions of a mouthpiece.
- 8.7 Distinguish between external and internal mouthpieces.

LOSSES OF HEAD OF FLOWING LIQUID

9 Understand the aspects of different types of losses of head of flowing liquid.

- 9.1 Explain the meaning of fluid friction
- 9.2 Define different types of losses of head of flowing liquid such as:
 - a) Loss of head due to friction.
 - b) Loss of head due to bend and elbows.
 - c) Loss of head due to sudden enlargement.
 - d) Loss of head due to sudden contraction.
 - e) Loss of head at entrance to pipe.
 - f) Loss of head due to obstruction.
- 9.3 Write down the formulae for different types of losses of head.
- 9.4 Calculate loss of head due to friction.

FRICTION AND FLOW THROUGH PIPES

10 Understand the aspects of friction and flow through pipes.

- 10.1 State the meaning of critical velocity of liquid.
- 10.2 State the meaning of the friction in pipes of flowing liquid, hydraulic gradient and hydraulic mean depth.
- 10.3 State the Chezy's formula for loss of head due to friction in pipes.
- 10.4 State the Darcy's formula for loss of head due to friction in pipes.
- 10.5 Calculate the loss of head due to friction in pipes using Chezy's formula.
- 10.6 Calculate the loss of head due to friction in pipes using Dracy's formula.

FLOW OF LIQUID THROUGH NOTCHES AND WEIRS

11 Understand the principle of flow through notches.

- 11.1 Define notch.
- 11.2 Identify different types of notches with sketches such as: rectangular notch, Vnotch and trapezoidal notch.
- 11.3 Outline the advantages of triangular notch over rectangular notch.
- 11.4 State the formulae for measuring discharges through rectangular notch, V-notch and trapezoidal notch.
- 11.5 Calculate the discharges through rectangular notch using discharge formulae.
- 11.6 Calculate the discharges through triangular notch using discharge formulae.
- 11.7 Calculate the discharges through trapezoidal notch using discharge formulae.

12 Understand the principle of flow through weirs.

- 12.1 Define the term weir.
- 12.2 Outline the differences between weirs and notches.
- 12.3 State Francis' formula for discharge through a rectangular weir.
- 12.4 State Bazin's formula for discharge through a rectangular weir.
- 12.5 Calculate the discharges through rectangular weir using Francis' formula.
- 12.6 Calculate the discharges through rectangular weir using Bazin's formula.

FLOW OF LIQUID THROUGH OPEN CHANNEL

13 Understand the aspects of flow of liquid through open channel.

- 13.1 Define the terms: open channel, wetted perimeter and hydraulic radius, hydraulic jump, critical depth.
- 13.2 State the different types of open channels.
- 13.3 State the Chezy's formula for velocity of flow in open channel.
- 13.4 State the Manning's formula for velocity of flow in open channel.
- 13.5 Select the conditions for most economical section of a rectangular channel.
- 19.6 Mention the uses of current meter and float to determine velocity of flow.

Practical :

- 1. Measure pressure at a particular section / point of a tank or pipe line:
 - a) by a piezometer.
 - b) by a simple manometer.
- 2. Measure difference of pressure between two sections of a flowing liquid: a) by differential manometer.
 - a) by differential manometer.
- b) by inverted differential manometer.
- 3. Demonstrate proof of Bernoulli's theorem.
- 4. Measure discharge through a pipe line by venturimeter.
- 5. Determine coefficient of discharge (Cd), coefficient of velocity (Cv) and coefficient of contraction (Cc).
- 6. Measure discharge through a triangular notch (V-notch) and calculate coefficient of discharge.
- 7. Determine co-efficient of friction in GI and PVC pipe.
- 8. Measure the loss of head due to friction in pipe.

9. Measure the loss of head due to sudden enlargement and sudden contraction of pipe.

- 10. Observe different types of flow in a typical open channel.
- 11. Measure velocity of flow in a typical open channel by :
 - a) a current meter.
 - b) a float.
 - c) a pitot tube.

12. Observe hydraulic jump in a typical open channel due to obstruction of flow by a weir and measure the depth of the jump.

REFERENCE BOOKS

- 1 Hydraulics E. H. Lewitt
- 2 A text book of Hydraulics R. S. Khurmi
- 3 Hydraulics H. W. King

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OBJECTIVES

To develop skill on spreadsheet applications. To develop skill on creating graphs. To assist in the efficient use of database packages. To develop skill on computerized database management. To develop skill on programming with database management.

SHORT DESCRIPTION

Spreadsheet Analysis Package: Applications of spreadsheet; Using worksheet; Apply formula and functions in worksheet; Creating & printing graphs; Create simple macros.

Database management package: Creating the database; Editing the database; Searching the records; Customizing the data entry form; Creating the query; Arranging the records; Generating reports.

Database management language: Creating a command file; Writing simple database program using decision-making commands.

DETAIL DESCRIPTION

SPREAD SHEET ANALYSIS PACKAGE:

1 Apply the basic skills of a spreadsheet software package

- 1.1 Run a spreadsheet software package.
- 1.2 Identify and use different areas (working area, border area, control panel, mode indicator, and status indicator) of the worksheet screen.
- 1.3 Identify the function of different keys (typing key, calculator key, text key, cursor key, etc.) of the keyboard.
- 1.4 Move around the worksheet using keys and combination of key.
- 1.5 Identify and use the on-screen help facility.
- 1.6 Identify and use the types of data, numbers, labels and formula.
- 1.7 Demonstrate menus, submenus, pop-up menu, etc.

2 Manage workbooks and windows.

- 2.1 Make and use workbooks.
- 2.2 Access different types of files.
- 2.3 Open files as read only.
- 2.4 Demonstrate the options for saving files.
- 2.5 Display a workbook in more than one window.
- 2.6 Work with more one workbook.
- 2.7 Close a workbook.

3 Create a worksheet and use simple commands.

- 3.1 Activate entries in a worksheet.
- 3.2 Use edit key (F2) to correct or to modify entries.
- 3.3 Activate the command menus and select commands.
- 3.4 Save the worksheet.
- 3.5 Exit from spreadsheet .
- 3.6 Retrieve a previously saved worksheet.
- 3.7 Modify the worksheet.
- 3.8 Save a modified worksheet.

4 Apply formula, function and using templates.

- 4.1 Use simple formulae to solve arithmetical computation.
- 4.2 Use arithmetical operators in formula.
- 4.3 Edit formula.
- 4.4 Use mathematical function to solve simple equations.
- 4.5 Make and use workbook templates.
- 4.6 Make changes in existing workbook templates
- 4.7 Validate numbers, dates, times & text.
- 4.8 Show custom validation.

5 Solve engineering problems using formula and functions

- 5.1 Use mathematical functions to compute trigonometric values, absolute values, random number, square root, logarithmic values, etc for solving engineering problems.
- 5.2 Use logical functions to perform an operation depending on a condition in engineering problem.
- 5.3 Use statistical function to compute summation, average, minimum value, maximum value, etc in engineering problem.

6 Work with cell pointer to a particular cell.

- 6.1 Use GOTO key to move the cell pointer to particular cell.
- 6.2 Use the ABSOLUTE KEY to change cell address from one from to another in formula or in functions.
- 6.3 Enter range in formulae or in functions by typing directly or by using cell pointer.
- 6.4 Create a range name.
- 6.5 Use range name in formula & functions.
- 6.6 Copy, Move & Erase cell range.

7 Format a worksheet.

- 7.1 Change the width of a column, a range of column, and change the columns width globally.
- 7.2 Insert blank columns and blank rows in a worksheet.
- 7.3 Delete columns and blank rows in a worksheet.
- 7.4 Format the display of data of a worksheet globally or by referring a range of cells (e.g. currency format, exponential format, comma format, etc.).
- 7.5 Format the display of data and of a worksheet globally or referring of cells.
- 7.6 Protect worksheet, function, formula, important text and unprotect a range for entering entries.
- 7.7 Work with window for viewing worksheet in different ways and freeze rows or columns.
- 7.8 Create, change and delete a style.

8 Exercise on Sorting, Searching and Worksheet Printing.

- 8.1 Create a database program
- 8.2 Sort a database in different ways.
- 8.3 Search a record from the database using search criteria.
- 8.4 Extract records from the database that match a given criteria.
- 8.5 Delete records that a given criteria from the database using available database commands.
- **8**.6 Show the Print Preview and adjust Page setup option.
- 8.7 Create and use page headers of footers.
- 8.8 Set print area, print titles and different print option
- 8.9 Print portion of worksheet and multiple worksheets
- 8.10 Print ranges from different worksheets on the same pages.

9 Create and Print graphs.

- 9.1 Create bar, line, X-Y and pie graphs.
- 9.2 Add color, titles, legend, gird and levels to the graph.
- 9.3 Add visual impact with colors.
- 9.4 Create linked pictures.
- 9.5 Save the graph and assign names to different graphs of a single worksheet.
- 9.6 Print graphs (low or high quality graphs.)
- 9.7 Plot graphs using a plotter using different colors.

9.8 Change graphs size, print & plot them.

10 Create Macros and using macro commands.

- 10.1 Create simple macros (e.g. to change the width of a cell, to format a cell display, to erase a range of cells etc.) using keystroke commands.
- 10.2 Create a macro to convert values into labels vice versa.
- 10.3 Create a macro for inserting blank rows between two rows of data in a worksheet.
- 10.4 Create a macro for deleting the inserted blank rows in a worksheet.

DATABASE MANAGEMENT PACKAGE:

11 Create the new database.

- 11.1 Identify the practical database in real world.
- 11.2 Identify the fields and records of a database.
- 11.3 Identify the different phases of database design.
- 11.4 Collect the data form a typical field.
- 11.5 Determine the category of a typical field.
- 11.6 Design a typical Paper- pencil database form raw data.
- 11.7 Run a generalized database management package and identify its display Screen
- 11.8 Identify the different options of the selected packages.
- 11.9 Use the on-screen help facilities of DBMS package
- 11.10 Create and save the table structure.

12 Change the table structure and edit database.

- 12.1 Modify and Edit the table structure.
- 12.2 Verify the structure (i.e. data of update, number of records. etc)
- 12.3 Enter or append the new records in the database.
- 12.4 Use the key combinations for editing.
- 12.5 Use the available options to edit fields.
- 12.6 Delete unwanted records and files.
- 12.7 Save & close database file.
- 12.8 Use different modes to append and edit records of database.

13 Search, display and arrange the records of database.

- 13.1 View a database using list and display command
- 13.2 Retrieve the database records with different conditions.
- 13.3 Search within a field.
- 13.4 Keep the track of specific records.
- 13.5 Keep the database up-to-date.
- 13.6 Sort a database on single or multiple fields.
- 13.7 Sort with qualifier (i.e. sort with specific subset of records).
- 13.8 Index the database on single or multiple fields.
- 13.9 Use the function to index on different field types.
- 13.10 Use the commands for selective indexing and to control the order of records.

14 Create the customized data entry form.

- 14.1 Draw a typical data entry screen with paper-pencil work.
- 14.2 Design the screen with all fields.

- **14**.3 Move the field to make the entry form logical and easy to use.
- 14.4 Change the field width.
- 14.5 Add or delete field (if necessary).
- 14.6 Change the display characteristics of fields.
- 14.7 Use picture functions template and range to format the displayed data.
- 14.8 Use different options and commands in design menu.
- 14.9 Draw lines and boxes on the form.

15 Create the query.

- 15.1 Display and identify query design screen.
- 15.2 Build a simple query
- 15.3 Save & apply the query.
- 15.4 Use the query design menu options.
- 15.5 Use the symbols and operators to build query.
- 15.6 Search the records with matching on two or more fields.
- 15.7 Select the records within range using range operators.
- 15.8 Find the records with inexact and complex matching.
- 15.9 Sort the records within queries.

16 Generate the custom reports.

- 16.1 Send the reports to the screen or to a file.
- 16.2 Use the print menu options and dos-prompt options.
- 16.3 Produce a quick and selective report.
- 16.4 Plan the design of the report.
- 16.5 Design a custom columnar report.
- 16.6 Find the parts of a report specification.
- 16.7 Make the changes to the report specification.
- 16.8 Save & run the report.

17 Work with multiple database and relationship.

- 17.1 Merge the data form one file to another.
- 17.2 View the files to relate two or more database files.
- 17.3 Set up the relationship.
- 17.4 Modify the relationship.
- 17.5 Create the report from relational database.

DATABASE MANAGEMENT LANGUAGE:

18 Create a simple command file using expression and function.

- 18.1 Identify the database editor.
- 18.2 Use the commands to assign different types of data values to variables.
- 18.3 Save the memory variable.
- 18.4 Display the memory variable.
- 18.5 Release & restore the memory variable.
- 18.6 Use the mathematical expression.
- 18.7 Use the mathematical, relational, logical and string operators.
- 18.8 Use the common function such as EOF, BOF DATE, UPPER & LOWER < CTOD, DTOS, SPACE, TRIM, STR, etc. in command file.
- 18.9 Use the commonly use commands such as SET TALK, SKIP, RETURN in command file.
- 18.10 Use the commands to display a string of characters and wait for user response.
- 18.11 Use commands to display or print text.

19 Design & write simple programs.

19.1 Identify the basic steps to design a program.

- 19.2 Write the pseudocode for simple program.
- 19.3 Convert the pseudocode into actual program code.
- 19.4 Verify & documents the simple program.
- 19.5 Save the command file and then exit.
- 19.6 Run the program.

20 Use the decision making commands in Programs.

- 20.1 Use DO WHILE ---- ENDDO, IF ---- ENDIF and DO CASE ---- ENDCASE to control program flow.
- 20.2 Use SCAN ---- ENDSCAN command instead of DO WHILE ---- ENDDO.
- 20.3 Use IF, ELSE and ENDIF commands to branch to the part the program.
- 20.4 Use nested IF ---- ENDIF statements.
- 20.5 Write simple program using decision making commands.
- 20.6 Use immediate IF function.
- 20.7 Write simple program using immediate IF function.
- 20.8 Use CASE ---- ENDCASE statement instead more than three IF ---- ENDIF statements.
- 20.9 Use the EXIT, CANCEL, WAIT and ZAP command in database program.
- 20.10 Use macro function within programs.

5841 BUSINESS ORGANIZATION & COMMUNICATION T P C 2 0 2

AIMS

1

- To be able to understand the basic concepts and principles of business organization.
- To be able to understand the banking system.
- To be able to understand the trade system and stock exchange activities in Bangladesh.
- To be able to understand the basic concepts of communication and its types, methods.
- to be able to perform in writing , application for job, complain letter & tender notice.

SHORT DESCRIPTION

Principles and objects of business organization; Formation of business organization; Banking system and its operation; Negotiable instrument; Stock Exchange; Home trade and foreign trade.

Basic concepts of communication Communication model& feedback; Types of communication; Methods of communication; Formal & informal communication; Essentials of communication; Report writing; Office management; Communication through correspondence; Official and semi- official letters.

DETAIL DESCRIPTION

Understand business organization.

- 1.1 Define business.
- 1.2 Mention the objects of business.
- 1.3 Define business organization.
- 1.4 State the function of business organization.

2 Understand the formation of business organization.

- 2.1 Define sole proprietorship, partnership, joint stock company. and cooperative
- 2.2 Describe the formation of sole proprietorship, partnership , joint stock company, & co operative.
- 2.3 Mention the advantages and disadvantages of proprietorship, partnership and joint stock company.
- 2.4 State the principles of Co operative & various types of Co operative.
- 2.5 Discuss the role of co-operative society in Bangladesh.

3 Understand the banking system and negotiable instrument.

- 3.1 Define bank.
- 3.2 State the service rendered by bank.
- 3.3 Describe the classification of bank in Bangladesh.
- 3.4 State the functions of Bangladesh Bank in controlling money market.
- 3.5 State the functions of commercial Bank in Bangladesh
- 3.6 Mention different types of account operated in a bank.
- 3.7 Mention how different types of bank accounts are opened and operated.
- 3.8 Define negotiable instrument.
- 3.9 Discuss various types of negotiable instrument.
- 3.10 Describe different types of cheque.
- 3.11 Define letter of credit.

4 Understand the home & foreign trade

- 4.1 Define home trade & foreign trade.
- 4.2 Describe types of home trade.
- 4.3 Differentiate between whole sale trade and retail trade.
- 4.4 Define foreign trade.
- 4.5 Mention the advantages and disadvantages of foreign trade.
- 4.6 Mention the classification of foreign trade.
- 4.7 Discuss the import procedure & exporting procedure.
- 4.8 Discuss the importance of foreign trade in the economy of Bangladesh.

5 Understand the basic concepts of communication

- 5.1 Define communication & business communication.
- 5.2 Describe the scope of business communication.
- 5.3 State the objectives of business communication.
- 5.4 Discuss the essential elements of communication process.

6 Understand the communication model and feedback.

- 6.1 Define communication model.
- 6.2 State the business functions of communication model.
- 6.3 Define feedback .
- 6.4 State the basic principles of effective feedback.
- 6.5 Explain the essential feedback to complete communication process.

7 Understand the types of communication.

- 7.1 Explain the different types of communication.
- 7.2 Distinguish between upward and downward communication.
- 7.3 Define two-way communication.
- 7.4 Describe the advantages and disadvantages of two-way communication.
- 7.5 Define formal & informal communication.
- 7.6 Describe the advantages and disadvantages of formal & informal communication.
- 7.7 Distinguish between formal and informal communication.

8 Understand the methods of communication.

- 8.1 Define communication method.
- 8.2 Discuss the various methods of communication.
- 8.3 Describe the advantages and disadvantages of oral communication.

- 8.4 Describe the advantages and disadvantages of written communication.
- 8.5 Distinguish between oral and written communication.

9 Understand the essentials of communication.

- 9.1 Discuss the essential feature of good communication.
- 9.2 Describe the barriers of communication.
- 9.3 Discuss the means for overcoming barriers to good communication.

10 Understand the report writing.

- 10.1 Define report , business report & technical report.
- 10.2 State the essential qualities of a good report.
- 10.3 Describe the factors to be considered while drafting a report.
- 10.4 Explain the components of a technical report.
- 10.5 Distinguish between a technical report and general report.
- 10.6 Prepare a technical report.

11 Understand the office management.

- 11.1 Define office and office work.
- 11.2 State the characteristics of office work.
- 11.3 Define filing and indexing.
- 11.4 Discuss the methods of filing.
- 11.5 Discuss the methods of indexing.
- 11.6 Distinguish between filing and indexing.

12 Understand the official and semi-official letters.

- 12.1 State the types of correspondence.
- 12.2 State the different parts of a commercial letter.
- 12.3 Define official letter and semi-official letter.
- 12.4 Distinguish between official letter and semi-official letters.
- 12.5 Prepare the following letters: Interview letter, appointment letter, joining letter and application for recruitment. Complain letters, tender notice.