BANGLADESH TECHNICAL EDUCATION BOARD
Agargoan, Dhaka-1207.

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

ELECTRICAL TECHNOLOGY

TECHNOLOGY CODE: **667**

2nd SEMESTER

DIPLOMA IN ENGINEERING
PROBIDHAN-2016

ELECTRICAL TECHNOLOGY (667)

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	66721	Electrical Circuits-1	3	3	4	60	90	25	25	200
2	66722	Electrical Appliances	2	3	3	40	60	25	25	150
3	66611	Computer Application	0	6	2	0	0	50	50	100
4	65921	Mathematics-2	3	3	4	60	90	50	0	200
5	65912	Physics-1	3	3	4	60	90	25	25	200
6	65711	Bangla	3	3	4	60	90	50	0	200
7	65712	English	2	0	2	40	60	0	0	100
Total			**16**	**21**	**23**	**320**	**480**	**225**	**125**	**1150**

66721	ELECTRICAL CIRCUITS-I	T	P	C
		3	3	4

OBJECTVES

- To understand the concept of network theorems.
- To develop understanding of AC fundamentals.
- To understand the fundamental principles of single phase AC circuit in solving the different circuit problems.
- To develop skill in measuring current, voltage and power in RL, RC and RLC circuits.

SHORT *DESCRIPTION*

Network theorem-Circuit Parameters; Electrical network; Kirchhoff's Law; Thevenin's theorem; Norton's theorem; Superposition theorem; Maxwell's theorem; Maximum power transfer theorem; Single phase AC circuits; Principles of basic circuits; Vectors; Impedance triangle; Power and power factor.

DETAIL DESCRIPTION

THEORY

1. **Circuit parameters**
   - 1.1 Define direct current (DC)
   - 1.2 Define circuit parameters.
   - 1.3 List the circuit parameters.
   - 1.4 Define circuit parameters with units.

2. Electric Network

- 2.1 Define electric networks.
- 2.2 List the different types of electric networks.
- 2.3 Explain the different types of electric networks.
- 2.4 Define active and passive network.
- 2.5 Define current source and voltage source.
- 2.6 Explain the current and voltage source in electric network.
- 2.7 Give example of current source & voltage source.

3. Circuit theorems

- 3.1 State & explain Kirchhoff's current Law (KCL) and Kirchhoff's voltage Law (KVL).
- 3.2 State & explain Thevenin's theorem.
- 3.3 State & explain Superposition theorem.
- 3.4 State & explain Norton's theorem.
- 3.5 State & explain Maxwell's theorem.
- 3.6 State & explain Maximum power transfer theorem.
- 3.7 Solve problems related to all Theorems.

4. **Star-Delta conversion**

4.1 State star-delta conversion.

4.2 Explain star-delta conversion.

4.3 Convert star to delta connection and vice versa.

4.4 Solve problems related to star-delta conversion.

5. AC circuit and AC fundamentals.

5.1 Define AC circuit (AC).

5.2 Explain the importance of AC systems.

5.3 Describe the advantages and disadvantages of AC circuit.

5.4 Principle of the generation of AC voltage.

5.5 Derive the equation: $e = E_{max}Sin\omega t$

5.6 Define cycle, frequency & time period with units.

5.7 Show the relation: $f = \frac{PN}{120}$

5.8 List the commercial frequency of different countries.

5.9 Explain phase & phase difference with diagram.

5.10 Solve related problems.

6. **Alternating quantities and rms values.**

6.1 Define instantaneous values, average and maximum values of alternating quantities.

6.2 Generalize the rms values.

6.3 Define form factor and peak factor.

6.4 Define ohmic resistance & effective resistance.

6.5 Compare ohmic & effective resistance.

6.6 Solve problems on instantaneous, average and rms values.

7. Vectors and vector quantities.

7.1 Define vector quantities.

7.2 Explain vector representation of alternating voltage and current.

7.3 Explain vector in Polar form.

7.4 Explain vector in Rectangular form.

7.5 Formulate the relation between vectors expressed in rectangular and polar co-ordinate.

7.6 Solve problems relating to vector sum & difference, multiplication and division.

8. AC circuit (containing pure resistance, inductance and capacitance).

8.1 Sketch a circuit containing pure Resistance.

8.2 Explain the vector & phasor diagram of a pure resistive circuit.

8.3 Deduce the current and voltage relation in pure resistive circuit.

8.4 Sketch a circuit containing pure Inductance.

8.5 Explain the vector & phasor diagram of pure Inductive circuit.

8.6 Evaluate the relation among inductive reactance, current and voltage in pure Inductive circuit.

8.7 Sketch a circuit containing pure Capacitance.

8.8 Explain the vector & phasor diagram of pure capacitive circuit.

8.9 Formulate capacitive reactance.

8.10 Simplify current and voltage relation in pure capacitive circuit.

9. AC series circuit (containing resistance, inductance and capacitance).

9.1 Draw circuit containing resistance and inductance (RL) in series.

9.2 Explain vector & phasor diagram in RL series circuit.

9.3 Formulate impedance, current and voltage drop in RL series circuit.

9.4 Draw impedance triangle in RL series circuit.

9.5 Draw circuit containing resistance and capacitance (RC) in series.

9.6 Explain vector & phasor diagram in RC series circuit.

9.7 Formulate impedance, current and voltage drop in RC series circuit.

9.8 Draw impedance triangle of RC series circuit.

9.9 Solve problems on RL & RC series circuits.

9.10 Sketch a circuit containing resistance, inductance and capacitance (RLC) in series.

9.11 Explain vector & phasor diagram of RLC series circuit.

9.12 Draw impedance triangle of RLC series circuit.

9.13 Calculate inductive reactance, capacitive reactance, total impedance, current & voltage drop in RLC series circuit.

9.14 Solve problems on RLC series circuit.

10. Power & power factor in AC circuit.

10.1 Define power, power factor, active & reactive power.

10.2 Calculate power and power factor of pure resistive circuit.

10.3 Calculate power and power factor of pure Inductive circuit.

10.4 Calculate power and power factor of pure capacitive circuit.

10.5 Calculate power, power factor, active & reactive power of RL, RC & RLC series circuit.

10.6 Explain the power diagram of R, L, C, RL, RC & RLC series circuit.

10.7 Solve problems on power & power factor of different series circuit.

PRACTICAL

1 Show skill in using oscilloscope in measuring AC voltage & frequency.

1.1 Select the oscilloscope.

1.2 Select required tools and equipment.

1.3 Identify the control & function knobs of oscilloscope

1.4 Set the function knobs of oscilloscope as instructed.

1.5 Identify the control & function knobs of a signal generator.

1.6 Set the function knobs as instructed

1.7 Check all connections.

2 Show skill in verifying kerchief's laws.

2.1 Select experiment circuit, components, meters and necessary materials.

2.2 Construct a series-parallel circuit.

2.3 Select the series section of the circuit.

2.4 Verify Kirchhoff's voltage law.

2.5 Select the parallel section of the circuit.

2.6 Verify Kirchhoff's current law.

3 Show skill in verifying Thevenin's theorem.

3.1 Select an experiment circuit.
3.2 Select tools, equipment and circuit.
3.3 Construct the circuit as per diagram.
3.4 Mark the circuit as per diagram.
3.5 Measure open circuit voltage across the points.
3.6 Measure the equivalent resistance from the two points with appropriate condition.
3.7 Record Thevenin's voltage and resistance.
3.8 Verify the data with the theoretical calculation.

4 Show skill in verifying Norton's theorem.

4.1 Select an experiment circuit.
4.2 Select tools, equipment and circuit.
4.3 Construct the circuit as per diagram.
4.4 Mark the points for Norton's equivalence.
4.5 Measure short circuit current at the points.
4.6 Measure the equivalent resistance/ conductance at the points with appropriate condition.

5 Show skill in verifying Superposition theorem.

5.1 Select an experiment-circuit.
5.2 Select tools, equipment and materials.
5.3 Construct the circuit with at least two sources of power supply.
5.4 Select a branch for superposition.
5.5 Activate one source at a time making other sources short circuited.
5.6 Measure the current though the selected branch.
5.7 Repeat the steps with all the .sources.
5.8 Add all the measured current algebraically for the selected branch.
5.9 Measure the current though the branch activating all the sources.
5.10 Compare the measured value with that of calculated value.

6 Show skill in maximum power transfer theorem.

6.1 Select an experiment-circuit.
6.2 Select tools, equipment and materials.
6.3 Connect the source according to circuit diagram.
6.4 Record and computing data.
6.5 Calculate the P_L (Load power) using $P_L=l_L^2 R_L$ equation.
6.6 Verify maximum power transfer theorem.

7 Show skill in measuring effective resistance of a coll.

7.1 Draw the circuit diagram for determining the effective resistance.
7.2 Collect tools & equipment.
7.3 Correct the circuit according to the circuit diagram using proper equipment.
7.4 Check all connection points before actual operation.
7.5 Connect DC supply and record readings.
7.6 Calculate Ohmic resistance from the formula by recording relevant data:$R_{dc}=P_{dc}/l^2_{dc}$
7.8 Determine effective resistance from the formula $R_{ac}=P_{ac}/l^2_{ac}$
7.9 Compare the Ohmic resistance and effective resistance and find the ratio.

8 Show skill in determining the values of resistance & inductance and draw the vector diagram of RL series circuit.

8.1 Sketch the circuit diagram for determining resistance and inductance of a RL series circuit.

8.2 Collect tools, equipment and materials for the experiment.

8.3 Connect the circuit according to the circuit diagram using proper.

8.4 Check all connection points before actual operation.

8.5 Apply proper voltage & record readings from the meter.

8.6 Find the value of resistance & phase angle from relevant data.

8.7 Sketch the vector diagram with the relevant data as obtains.

9 Show skill in determining the values of resistance & capacitance and drawing vector diagram of RC series circuit.

9.1 Sketch the circuit diagram for RC series circuit.

9.2 Collect tools, equipment and materials for the experiment.

9.3 Connect the circuit according to the circuit diagram using proper equipment.

9.4 Check all connection points before actual operation & apply the voltage and record the relevant readings.

9.5 Determine the value if resistance, capacitance & phase angle from the data.

9.6 Sketch the vector diagram with the help of relevant data as obtained.

10. Show skill in determining the values of resistance & inductance, capacitance and draw the vector diagram from of RLC series circuit.

10.1 Sketch the circuit diagram for RLC series circuit

10.2 List tools, equipment and materials and for the experiment.

10.3 Connect the circuit according to the circuit diagram using proper equipment.

10.4 Check all connection points before actual operation.

10.5 Apply proper power supply to the circuit and record the readings from the meter.

10.6 Determine the values of resistance, inductance, capacitance and phase angle from the relevant data.

10.7 Verify the supply voltage is equal to the vector sum of voltage drop in each parameter.

10.8 Sketch the vector diagram with the help of relevant data as obtained.

11 Show skills in determining power factor of a RLC series circuit and drawing vector diagram.

11.1 Sketch the circuit diagram for RLC series circuit.

11.2 Collect tools, equipment and materials for the experiment

11.3 Connect the circuit according to the circuit diagram using proper equipment.

11.4 Check all connection point before actual operation.

11.5 Apply proper power supply to the circuit and record the readings from the meter.

11.6 Determine the value of phase angle and power factor from the relevant data.

11.7 Sketch the vector diagram with the relevant data.

Reference Books:

A text book of Electrical Technology---- B.L Theraja

Introduction to Electrical Engineering ---- V.K Mehta.

Alternating Current Circuit--- Corcoran

66722	ELECTRICAL APPLIANCES	T	P	C
		2	3	3

OBJECTIVES

- To develop understanding and skill on the construction and operation of electrical appliances based on heating principle.
- To develop understanding and skill on the construction and operation of appliances operated by electric motor.
- To enable to acquire skill/competence in diagnosing/localizing faults and repairing & servicing of electrical appliances.

SHORT DESCRIPTION

Electric iron; Electric heater; Rice cooker; Electric Kettle; Geyser; Electric fan; Rechargeable (Emergency) lamp; Vacuum Cleaner; Blower; Dehumidifier; Blender; Washing machine; Refrigerator; Air conditioner; Microwave oven;

DETAIL DESCRIPTION

THEORY

1 Basic principle of electric appliances.

1.1.1 State the meaning of electric appliances.
1.1.2 List the names of appliances based on heating principles.
1.1.3 List the names of the appliances operated by electric motor.

2 Electric iron.

2.1 Define electric iron.
2.2 List different types of electric irons.
2.3 Difference between an ordinary and an automatic electric iron.
2.4 Identify different parts of an electric iron.
2.5 State the operating principles of an electric iron.
2.6 Explain the operation of thermostat in an automatic electric iron.
2.7 List the possible faults and their causes and remedies of an electric iron.

3 Electric heater.

3.1 Define electric heater.
3.2 List different types of electric heater.
3.3 List different parts of a room heater, surface heater and water heater.
3.4 List the possible faults and their causes and remedies of an electric heater.

4 Rice cooker.

4.1 Define rice cooker.
4.2 Describe the function of a rice cooker.
4.3 List the main parts of a rice cooker.
4.4 List the possible faults and their causes and remedies of a rice cooker.

5 Electric Kettle.

5.1 State Principle of operation of electric Kettle.
5.2 List deferent parts of electric Kettle.
5.3 List the possible faults and their causes and remedies of an electric kettle.

6 Geyser.

6.1 Define geyser.
6.2 List the different parts of geyser.
6.3 Mention the safety precaution of Geyser.
6.4 List of possible faults and causes and their remedies of a geyser.

7 Table fan/pedestal fan.

7.1 Define table fan/pedestal fan.
7.2 Describe the function of a table fan/pedestal fan.
7.3 List different parts of a table fan/pedestal fan.
7.4 List various components of an electronic fan regulator.
7.5 State the operation of an electronic fan regulator.
7.6 List the possible faults and their causes and remedies of a table fan/pedestal fan.

8 Rechargeable (emergency) lamp.

8.1 Define rechargeable lamp.
8.2 Explain the working principle of a rechargeable lamp.
8.3 Name the different parts of a rechargeable lamp.
8.4 List the possible faults and their causes and remedies of a rechargeable lamp.

9 Vacuum cleaner.

9.1 Define vacuum cleaner.
9.2 State the working principle of a vacuum cleaner.
9.3 Name the different parts of a vacuum cleaner.
9.4 List the possible faults and their causes and remedies of a vacuum cleaner.

10 Electric blower.

10.1 State the working principle of an electric blower.
10.2 Name the different parts of an electric blower.
10.3 List the possible faults and their causes and remedies of a electric blower.

11 De-humidifier.

11.1 State the principle of operation of a dehumidifier.
11.2 Name different parts and their function of a dehumidifier.
11.3 Sketch the circuit diagram of a de-humidifier.
11.4 List the possible faults and their causes and remedies of a de-humidifier.

12 Blender.

12.1 State the principle of operation of a blender.
12.2 List the different parts of a blender.
12.3 State the function of the timer in a blender.
12.4 List the possible faults and their causes and remedies of a blender.

13 Washing machine.

13.1 Define washing machine.
13.2 List the different types of washing machine
13.3 State the working principle of operation of a washing machine.
13.4 List the different parts of a washing machine.
13.5 Explain the function of the timer in a washing machine.
13.6 List the possible troubles and their causes and remedies of a washing machine.

14 Refrigerator.

14.1 Define refrigerator.
14.2 List of different components of refrigerator.
14.3 State the function of different components of refrigerator
14.4 List the possible faults and their causes and remedies of a refrigerator.

15 Air conditioner.

15.1 State the principle of operation of an air conditioner.
15.2 List different parts of an air conditioner.
15.3 State the function of filter, ducts and grills, air-conditioning circuit, control, cooling unit and electrical control unit.
15.4 List the possible electrical faults and their causes and remedies of an air conditioner.

16 Microwave oven.

16.1 Describe the function of a microwave oven.
16.2 List the main parts of a microwave oven.
16.3 List different parts of heat control and timer in an oven.
16.4 Describe the function of heat control and timer in an oven.
16.5 List the possible faults and their causes and remedies of a microwave oven.

PRACTICAL

1 Perform maintenance and servicing an electric iron.

1.1 Select the equipment and tools necessary for disassembling and servicing an electric iron.
1.2 Disassemble the electric iron.
1.3 State the different parts of the electric iron.
1.4 Observe the heating element and operation of thermostat in the electric iron.
1.5 Diagnose the possible problems in the electric iron.
1.6 Repair or replace the defective parts, if any.
1.7 Reassemble the parts and connect the iron to the power source.

2.2 Perform maintenance and servicing of different types of electric heaters.

2.1 Disassemble the different parts of the electric heater.
2.2 Sketch the main parts of the electric heater.
2.3 Sketch the circuit diagram of a single throw and a double throw thermostatic control electric heater.
2.4 Identify the possible troubles in a heater with causes and remedies.
2.5 Repair or replace the defective parts of the heater, if any.
2.6 Reassemble the parts of the heater.
2.7 Connect the heater to service.

3 Perform repair and maintenance of a rice cooker.

3.1 Disassemble the parts of the rice cooker.
3.2 Sketch the main parts of the rice cooker.
3.3 Identify possible troubles with causes and remedies of a rice cooker.
3.4 Assemble the parts of the rice cooker.
3.5 Connect the cooker to the power source.

4 Perform the operation of a Geyser

4.1 Select the necessary tools for disassemble & assemble the components of Geyse**r**
4.2 Sketch the diagram
4.3 Select the different ranges of Geyser.
4.4 Connect the Geyser to the power source.
4.5 Observe the operation.

5 **Perform the operation and maintenance of an Electric Kettle.**

5.1 Select the necessary hand tools for disassemble and assemble the electrical components of the electric kettle.
5.2 Disassemble and assemble the electric kettle.
5.3 Sketch the diagram.
5.4 Connect into the power source.
5.5 Observe the operation.

6 Perform repair and maintenance of an oscillatory type fan.

6.1 Disassemble the different parts of the table fan/pedestal fan.
6.2 Observe the oscillatory mechanism of the oscillating type of fan.
6.3 Sketch the different parts of the fan.
6.4 Assemble the fan and connect to the power supply.
6.5 Observe the operation.

7 Perform repair and maintenance of a rechargeable (emergency) lamp.

7.1 Disassemble the rechargeable (emergency) lamp.
7.2 Sketch the different parts of the rechargeable lamp.
7.3 Test the battery of the lamp.
Check the parts to ensure its sound condition.
7.4 Repair and replace the defective parts, if any.
7.5 Reassemble the lamp and connect to the power source.
7.6 Observe the charging and discharging condition.

8 Perform repair and maintenance of an electric blower.

8.1 Disassemble the parts of the electric blower.
8.2 Sketch the main parts of the electric blower.
8.3 Check the parts to ensure the sound condition.
8.4 Repair or replace the defective parts, if any.
8.5 Reassemble the parts.
8.6 Connect the appliances to the power source.
8.7 Observe the operation.

9 Perform repair and maintenance of a vacuum cleaner.

9.1 Disassemble the parts of the vacuum cleaner.
9.2 Sketch the main parts of the vacuum cleaner.
9.3 Check the parts to ensure the sound condition.
9.4 Repair or replace the defective parts, if any.
9.5 Reassemble the parts.
9.6 Connect the appliances to the power source.
9.7 Observe the operation.

10 Study a dehumidifier.

10.1 Disassemble the dehumidifier.
10.2 Sketch the main parts of the dehumidifier.
10.3 Identify the major troubles with remedies.
10.4 Reassemble the parts.
10.5 Connect the dehumidifier to the power supply.
10.6 Observe the operation.

11 Perform repair and maintenance of a blender.

11.1 Disassemble the blender.
11.2 Sketch the main parts.
11.3 Identify the major faults generally occurred in a blender.
11.4 Assemble the blender.
11.5 Connect the blender to the power supply.
11.6 Observe the operation.

12 Perform repair and maintenance of a washing machine.

12.1 Identify the main parts of the washing machine.
12.2 Sketch the main parts of the washing machine.
12.3 Sketch the electrical circuit of the washing machine.
12.4 Draw the complete washing cycle of washing machine.
12.5 Dissemble the major components.
12.6 Make a visual observation.
12.7 Reassemble the parts.
12.8 Connect the washing machine to the power supply.
12.9 Observe the operation.

13 Perform repair and maintenance of electrical components of a refrigerator.

13.1 Identify the different parts of the refrigerator.
13.2 Identify the electrical components of the refrigerator.
13.3 Sketch the wiring circuit showing electrical control system.
13.4 Note down the maintenance procedure of a refrigerator.
13.5 Disassemble and assemble the thermostat control.
13.6 Connect into the power source.
13.7 Observe the operation.

14 Perform repair and maintenance of electrical components of air-conditioner.

14.1 List the main parts of the air-conditioner.
14.2 Sketch the main section namely fan with motor, filter, ducts and grill, air conditioning control, cooling unit and electrical control unit.
14.3 Sketch the wiring diagram.
14.4 Disassemble and assemble the electrical components of the air conditioner.
14.5 Connect the air conditioner to the power supply.
14.6 Observe the operation.

15 Perform maintenance and servicing of a microwave oven.

15.1 Disassemble the microwave oven.
15.2 Sketch the main parts of the microwave oven.
15.3 Make a visual study and test the different parts.
15.4 Sketch the electrical circuit diagram of the microwave oven.
15.5 List possible troubles with causes and remedies of a microwave oven.
15.6 Assemble the parts and connect the oven to the power source.
15.7 Observe the operation.

Reference Books:

1. Home appliances Service Guide – Edwin P. Anderson.
2. Study of electrical appliances and devices - K.B Bhatia
3. Electrical home appliances service manual -S. K . Gupta, Gt publication
4. Principle of Refrigeration - Dossat

66611	COMPUTER APPLICATION	T	P	C
		0	6	2

OBJECTIVES

- **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 P*rinter* 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

[**Operate Presentation Package:**

4.7 Create presentations:

4.7.1 Open a presentation package application and create a simple design for a presentation according to organizational requirements
4.7.2 Open a blank presentation and add text and graphics
4.7.3 Apply existing styles within a presentation
4.7.4 Use presentation template and slides to create a presentation
4.7.5 Use various ***Illustrations*** and ***effects*** in presentation
4.7.6 Save presentation to correct directory

4.8 Customize basic settings:

4.8.1 Adjust display to meet user requirements
4.8.2 Open and view different ***toolbars*** to view options
4.8.3 Ensure ***font settings*** are appropriate for the purpose of the presentation
4.8.4 View multiple slides at once

4.9 Format presentation:

4.9.1 Use and incorporate organizational charts, bulleted lists and modify as required
4.9.2 Add ***objects*** and manipulate to meet presentation purposes
4.9.3 Import ***objects*** and modify for presentation purposes
4.9.4 Modify slide layout, including text and colors to meet presentation requirements
4.9.5 Use ***formatting tools*** as required within the presentation
4.9.6 Duplicate slides within and/or across a presentation
4.9.7 Reorder the sequence of slides and/or delete slides for presentation purposes
4.9.8 Save presentation in another ***format***
4.9.9 Save and close presentation to disk

4.10 Add slide show effects:

4.10.1 Incorporate preset animation and multimedia effects into presentation as required to enhance the presentation
4.10.2 Add slide transition effects to presentation to ensure smooth progression though the presentation
4.10.3 Test presentation for overall impact
4.10.4 Use onscreen navigation tools to start and stop slide show or move between different slides as required

4.11 Print presentation and notes:

4.11.1 Select appropriate print format for presentation
4.11.2 Select preferred slide orientation
4.11.3 Add notes and slide numbers
4.11.4 Preview slides and spell check before presentation
4.11.5 Print the selected slides and submit presentation to appropriate person for feedback

5. Access Information using Internet and electronic mail

5.1 Access resources from internet

5.1.1 Appropriate internet ***browsers*** are selected and installed
5.1.2 Internet browser is opened and web address / URL is written/selected in /from address bar to access ***information.***
5.1.3 ***Search engines*** are used to access information
5.1.4 Video / Information are Shared /downloaded / uploaded from / to web site/***social media.***
5.1.5 ***Web based resources*** are used.
5.1.6 Netiquette' (or web etiquette) principles are searched and followed

5.2 Use and manage Electronic mail

5.2.1 ***Email services*** are identified and selected to create a new email address
5.2.2 Email account is created
5.2.3 Document is prepared, attached and sent to different types of recipient.
5.2.4 Email is read, forwarded, replied and deleted as per requirement.
5.2.5 Custom email folders are created and ***manipulated***
5.2.6 Email message is printed

65921 **MATHEMATICS -2** **T P C**
3 3 4

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, adjoin 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 adjoin 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 $e^x = 1 + \frac{x}{L^1} + \frac{x^2}{L^2} + \frac{x^3}{L^3} + \frac{x^4}{L^4}$ ..... to ∞
3.4 Solve problems of the followings types :
i) $1 + \frac{1}{L^2} + \frac{1}{L^4} + \frac{1}{L^6}$ + ... to ∞
ii) $\frac{1}{L^2} + \frac{1+2}{L^3} + \frac{1+2+3}{L^4} + \frac{1+2+3+4}{L^5}$ + ... 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

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

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

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

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.

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

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 :

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

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

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

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

5.2 Establish the followings.

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

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

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

5.3 Solve the problems of the following types:

i) 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 100^0 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 $\lim_{x \to a}$ f(x) and f(a).

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

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

8 Understand differential co-efficient and differentiation.

8.1 Define differential co-efficient in the form of

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

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) $\int_0^1 \frac{(\sin^{-1} x)^2}{\sqrt{-x^2}} dx$

P* =Practical continuous assessment

Reference

SL No	Athour	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 Shantinarayan	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

65912	PHYSICS-1	T	P	C
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OBJECTIVES

- To develop the students a background of basic science i.e. Physics required for understanding technological subjects.
- To develop a working knowledge of common engineering and industrial materials and to enable to determine through experiments the properties of such materials.
- To develop through experiments an understanding of fundamental scientific concept.
- To develop a basic knowledge and concept of physical properties of common engineering and industrial materials.

SHORT DESCRIPTION

Measurement, Units; Vector and Scalar quantities; Motion and Equations of motion; Force and Newton's Laws of motion; Gravity and Gravitation; Simple Harmonic motion; Hydrostatics; Surface tension and viscosity; Pressure, Sound; wave and sound Concepts and nature of sound, Velocity of sound, Ultrasonic.

DETAIL DESCRIPTION

THEORY :

1. PHYSICAL WORLD AND MEASUREMENT

1.1. Nature of Physical World.
1.2. Scope and Excitement of Physics.
1.3. Few Terms about Physics.
1.4. Physics and other world of Technological Knowledge.
1.5. Principle of Measurement.
1.6. Fundamental and Derived Quantities and Units.
1.7. Dimensions of Units.
1.8. Errors in Measurement.

2. SCALAR AND VECTOR QUANTITIES

2.1 Define vector and scalar quantities with examples.
2.2 Show the various representations of the vector quantities; and representation of a vector by unit vector.
2.3 Find and explain the resultant of two vectors in different directions.
2.4 Resolve a vector into horizontal & vertical component.
2.5 Explain the dot and cross product of two vectors.
2.6 Define laws of triangle of vector.

3. MOTION AND EQUATIONS OF MOTION

3.1 Define rest and motion
3.2 Classify and explain of motion.
3.3 Define and explain displacement, speed, velocity, acceleration and retardation.
3.4 Deduce the relationship between displacement, velocity, acceleration and retardation from these definitions.
3.5 Motion of a Projectile.
3.6 Equation of motion of a freely moving body thrown obliquely vertically upward or motion of a projectile.
3.7 Define angular velocity and linear velocity with their units.
3.8 Deduce the relation between angular velocity and linear velocity.
3.9 Define centripetal and centrifugal force with examples.
3.10 Prove that centrifugal force = $\frac{mv^2}{r}$
3.11 State and explain the laws of falling bodies and mention the equation of motion of a body when it is projected vertically upwards or downwards.

4. NEWTON'S LAWS OF MOTION FORCE AND FRICTION

4.1 Define force.
4.2 State Newton's laws of motion.
4.3 Define different units of force and their correlation and also mention the dimension of force.
4.4 Prove P=mf, from Newton's 2nd law of motion.
4.5 Find out the resultant of parallel forces.
4.6 Define inertia and momentum
4.7 State and prove the principles of conservation of momentum.
4.8 Define friction and describe the different kinds of friction.
4.9 Define the co-efficient of static friction.
4.10 Show that the co-efficient of static friction is equal to the tangent of angle of repose
4.11 State the merits and demerits of friction.

5. GRAVITY AND GRAVITATION

5.1 Define and explain the Kepler's Law.
5.2 Define gravity and gravitation.
5.3 Define and determine the gravitational constant (G) and also mention its units and dimension.
5.4 Define acceleration due to gravity 'g' and also mention its units and dimension.
5.5 Discuss the variation of 'g' at different places.
5.6 Define mass and weight with their units and dimension.
5.7 Distinguish between mass and weight.
5.8 Define and explain gravitational potential and escape velocity

6. SIMPLE HARMONIC MOTION (SHM)

6.1 Define Periodic and simple harmonic motion (SHM).
6.2 State the characteristics of SHM.
6.3 Describe a simple pendulum and a second pendulum.
6.4 Define effective length, amplitude, phase, complete oscillation, period of oscillation, frequency.
6.5 State and explain the laws of simple pendulum.
6.6 Motion of simple pendulum and it's time period.

7. WORK, POWER AND ENERGY

7.1 Define work, power and energy.
7.2 State the units and dimensions of work, power and energy.
7.3 State and prove the principle of the conservation of energy.
7.4 Define potential energy (PE) and kinetic energy (KE).
7.5 Derive the equation of potential and kinetic energy.
7.6 Recognize that the useful work can be found from:

$$\text{Efficiency} = \frac{\text{output work}}{\text{input work}} \times 100.$$

8. ELASTICITY

8.1 Name some of the general and special properties of matter.
8.2 Define Elasticity and Elastic limit.
8.3 Define perfectly elastic body and perfectly rigid body.
8.4 Define stress and strain with their units and dimensions.
8.5 State and explain the Hook's law.
8.6 Describe various kinds of modulus of elasticity.
8.7 Mention the units and dimensions of modulus of elasticity.
8.8 Define and explain Poisson's ratio.

9. HYDROSTATICS

9.1 Define pressure as force per unit area and state that it is measured in N/m^2 or Pascal.
9.2 State characteristics of liquid pressure.
9.3 Establish the pressure at a point in a fluid depend upon the density of the fluid, the depth in the fluid and acceleration due to gravity.
9.4 Surface tension and surface energy, Angle of contact.
9.5 Capillarity and theory of capillarity.
9.6 Viscosity and co-efficient of viscosity.
9.8 Necessity of viscosity.

10. WAVE AND SOUND

10.1 Wave and wave motion.
10.2 Transverse wave and longitudinal wave.
10.3 Some definitions relating waves.
10.4 Progressive wave and stationary waves.
10.5 Equation of progressive wave.
10.6 Sound and production of sound.
10.7 Sound is a longitudinal traveling wave.
10.8 Interference of sound: Constructive and Destructive interference.
10.9 Define beats and Mechanism of formation of beats.

11. SOUND AND VELOCITY OF SOUND

11.1 Identify that sound is produced by vibration and travels through a medium as a longitudinal wave.
11.2 Recognize that sound can be produced of different pitches (frequencies) & that the human ear has an audible frequency range covering approximately 20 Hz to 20 KHz.
11.3 State the approximate frequency range for
a. infrasonic sound, b. Ultrasonic (supersonic) sound.
11.4 Explain how sound is absorbed, reflected & refracted by different types of surface.
11.5 Describe the practical uses of echo sounding devices.
11.6 Define velocity of sound.
11.7 State the velocity of sound at NTP in still air.
11.8 Compare the effects of pressure, temperature & humidity on the velocity of sound in air.

PRACTICAL

1. Determine accurate diameter/side of an object using vernier calipers.
2. Measure the area of cross section of a wire by micrometer screw gage.
3. Measure the thickness of a glass plate by speedometer.
4. Verify the law of parallelogram of forces by a force board.
5. Draw $L\text{-}T^2$ graph and determine the value of "g" by using a simple pendulum.
6. Determine the coefficient of static friction.
7. Determine Young's modulus of a steel wire by Searle's apparatus.
8. Determine gravity of a solid heavier than and insoluble in water by hydrostatic balance.
9. Determine specific gravity of a liquid by specific gravity bottle.
10. Determine velocity of sound by resonance air column method.

REFERENCE BOOKS:

1. Higher Secondary Physics - First Part - by Dr. Shahjahan Tapan
2. A Text Book of Properties of of matter -By N Subrahmanyam and Brij Lal
3. A Text Book of Sound -By N Subrahmanyam and Brij Lal
4. Higher Secondary Physics- First Part -by Prof. Golam Hossain Pramanik
5. Higher Secondary Physics- First Part -by Ishak Nurfungnabi

65711	BANGLA	T	P	C
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উদ্দেশ্য :

১. মাতৃভাষা হিসেবে বাংলা ভাষার প্রকৃতি ও বৈশিষ্ট্য সম্পর্কে ধারণা লাভ। ভাষার ব্যবহারে প্রায়োগিক যোগ্যতা অর্জন।
২.বাংলা সাহিত্য পঠন-পাঠনের মাধ্যমে জাতীয় চেতনা, দেশপ্রেম, মুক্তিযুদ্ধের চেতনা, শুদ্ধাচার, নীতি ও মূল্যবোধের উন্মেষ ঘটানো।

সংক্ষিপ্ত বিবরণী :

মাতৃভাষা ও সৃজনশীলতা : বাংলা ভাষা রীতির বিচিত্রতা, বানান রীতি, পত্র রচনা এবং কবিতা, প্রবন্ধ, নাটক, উপন্যাস ও ছোট গল্প ।

বিশদ বিবরণী:

১.বাংলা ভাষার প্রয়োগ:

ক)বাংলা ভাষা :

ভাষার সংজ্ঞা, বাংলা ভাষা রীতি - সাধু, চলিত, আঞ্চলিক বা উপভাষা (সংজ্ঞা, বৈশিষ্ট্য, পার্থক্য ও উদাহরণ)

খ) বাংলা বানান রীতি ও শব্দ প্রয়োগ:

১.বাংলা একডেমির প্রমিত বানান রীতি, ণ-ত্ব ও ষ-ত্ব বিধি

২. শব্দ ও শব্দের শ্রেণি বিভাগ (সংজ্ঞা, শব্দের গঠন, উৎস বা উৎপত্তি ও অর্থগত)

৩.বাক্য প্রকরণ ও গঠন রীতি (সংজ্ঞা, বাক্য গঠন এবং প্রকার)

গ) পত্র রচনা :

আবেদন পত্র (চাকুরি, ছুটি), চাকুরিতে যোগদান পত্র, মানপত্র, স্মারকলিপি, সংবাদপত্রে প্রকাশের জন্য পত্র

২. বাংলা সাহিত্য:

ক. কবিতা :

১.বঙ্গভাষা –মাইকেল মধুসূদন দত্ত
২. সোনার তরী – রবীন্দ্র নাথ ঠাকুর
৩. উমর ফারুক –কাজী নজরুল ইসলাম
৪. বাংলার মুখ আমি– জীবনানন্দ দাশ
৫. আসাদের শার্ট – শামসুর রাহমান
৬. স্বাধীনতা শব্দটি কি করে আমাদের হলো? – নির্মলেন্দু গুণ

খ. প্রবন্ধ :

১. অর্ধাঙ্গী –রোকেয়া সাখাওয়াত হোসেন
২.বইকেনা – সৈয়দ মুজতবা আলী
গ. একাঙ্কিকা (নাটিকা): মানুষ –মুনীর চৌধুরী
ঘ. উপন্যাস: লালসালু – সৈয়দ ওয়ালী উল্লাহ
ঙ.ছোট গল্প:
১. হৈমন্তী – রবীন্দ্র নাথ ঠাকুর
২. একুশের গল্প – জহির রায়হান
৩. পাতালেহাসপাতালে – হাসান আজিজুল হক

ব্যবহারিক

১.নির্ধারিত বক্তৃতা :

বাংলাদেশ ও বাঙালি সংস্কৃতি, বিভিন্ন জাতীয় দিবস (একুশে ফেব্রুয়ারি ও আন্তর্জাতিক মাতৃভাষা দিবস, স্বাধীনতা দিবস, বিজয় দিবস,জাতীয় শোক দিবস, মুজিব নগর দিবস, মহান মে দিবস)

প্রাতিষ্ঠানিক বক্তৃতা- নবাগত শিক্ষক/ছাত্রছাত্রীদের বরণ, গুরুত্বপূর্ণ ব্যক্তিবর্গের আগমন উপলক্ষে বক্তৃতা।

২. উপস্থিত বক্তৃতা :

বিষয়বস্তু উন্মুক্ত

৩.আবৃত্তি :

১. মানুষ - কাজী নজরুল ইসলাম
২. আকাশ নীলা - জীবনানন্দ দাশ
৩. পল্লী জননী -জসীম উদ্‌দীন
৪. ছাড়পত্র - সুকান্ত ভট্টাচার্য
৫. তোমাকে পাওয়ার জন্য হে স্বাধীনতা - শামসুর রাহমান
৬. নিষিদ্ধ সম্পাদকীয় – হেলাল হাফিজ

৪. বিতর্ক (নমুনা)

সংস্কৃতিই আধুনিক মানুষের ধর্ম
তথ্য প্রযুক্তির অবাধ ব্যবহারই যুব সমাজেরঅবক্ষয়ের মূল কারণ
গতানুগতিক শিক্ষা নয় কর্মমুখি শিক্ষাই অর্থনৈতিক মুক্তির চাবিকাঠি
চালকের অসাবধনতাই সড়ক দুর্ঘটনার প্রধান কারণ
মুক্তিযুদ্ধের চেতনাই অসাম্প্রদায়িক বাংলাদেশ প্রতিষ্ঠার মূলমন্ত্র
প্রযুক্তির বিকাশই প্রকৃতি বিনাশের একমাত্র কারণ

৫. প্রতিবেদন প্রণয়ন ও উপস্থাপন:

স্থানীয় বিভিন্ন সমস্যা ও অনুসন্ধানী যে কোন বিষয়।

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Objectives:

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

- Reading, Listening With Understanding
- The Fluency Of Speech
- Grammatical Accuracy With Emphasis On Spelling & Punctuation
- Creative Writing

Seen Comprehension: (Marks-20)

Unit	Lesson	Title
People Or Institutions Making History (Unit One)	1	Nelson Mandela ,From Apartheid Fighter To President
	2	The Unforgettable History
Food Adulteration(Unit Three)	1	Food Adulteration Reaches Height
	2	Eating Habit And Hazards
Human Relationship(Unit Four)	2	Love And Friendship
Environment And Nature (Unit Eight)	1	Water ,Water Everywhere
	5	Kuakata: Daughter Of The Sea
Greatest Scientific Achievement (Unit Thirteen)	1	Some Of The Greatest Scientific Achievements Of The Last 50 Years
	2	Science And Technology Against An Age- Old Disease
Art And Music (Unit Fourteen)	1	What Is Beauty?
	3	Crafts In Our Time
Tours And Travels (Unit Fifteen)	1	Travelling To A Village In Bangladesh
	4	The Wonders of Vilayet

N.B: The Unit Mentioned Refers To The Text Book (1st Paper) English For Today For Class 11- 12 By National Curriculum & Text Book Board, Dhaka.

Grammar (Marks-20)

1. **(A) Uses of Articles.**
   (B) Uses of Tense *(Right Forms Of Verbs with Indicators)
   (C) Classify Verbs: (Regular and Irregular Verbs, Auxiliary, Principal, Finite, Non-Finite Verbs,)

2. **Sentence:**
   (A) Changing Sentences: (Assertive, Interrogative, Optative, Imperative, Exclamatory Simple, Complex and Compound), Comparison of Adjectives/Adverbs

   (B) Question Making: WH, Yes/No, Tag Question

3. Enrich Vocabulary: Synonyms, Antonyms; Suffix And Prefix.
4. Voice, Narration
5. Sentence Analysis:

Study of Part of Speech, (Type Of Verbs-Regular and Irregular Verbs, Auxiliary and Principal Verb)
Study of Phrases and Clauses (Noun/ Adjective/ Verb/ Participle /Adverbial/ Prepositional Phrases and Principal /Sub Ordinate /Co Ordinate Clauses)

Free Writing (Marks -20)

1. Write Dialogues: (With Teacher, Principal, Shopkeeper, Hotel Manager, Station Master, Newcomer, Buyers, Doctor, Friend, Colleagues Etc).
2. Report Writing On Different Events/ Occasions/ Accidents.
3. Writing Situational Personal and Official Letters.
4. Writing Job Application with CV /Appointment Letter / Joining Letter
5. Write A Guided Paragraph With Questions.