



St. PETER'S UNIVERSITY

St. Peter's Institute of Higher Education and Research

(Declared Under Section 3 of the UGC Act, 1956)

AVADI, CHENNAI – 600 054

TAMIL NADU

Common to All **D.Tech.** Programmes
(Effective From **2009 – 2010**)

Regulations and Syllabi

FIRST YEAR (I & II SEMESTERS)
(Distance Education)

St. PETER'S INSTITUTE OF DISTANCE EDUCATION

Recognized by Distance Education Council and

Joint Committee of UGC – AICTE - DEC, New Delhi

(Ref. F. No. DEC/SPU/CHN/TN/Recog/09/14 dated 02.04.2009 and

Ref.F.No.DEC/Recog/2009/3169 dated 09.09.2009)

ST. PETER'S UNIVERSITY
ST. PETER'S INSTITUTE OF DISTANCE EDUCATION
Chennai – 600 054.

Code No. – 701 to 706
DIPLOMA IN TECHNOLOGY
(Distance Education)

Regulations and Syllabi for I & II Semesters
(Effective from 2009-2010)

- 1. Eligibility:** Candidates for admission to the Three Year Diploma in Technology shall be required to have passed the S.S.L.C. Examination of the Board of Secondary Education, Tamil Nadu or any other examination recognized as equivalent thereto.
- 2. Duration of the Course:** Three Years (Six Semesters)
- 3. Medium:** The medium of instruction and examination is English.
- 4. Branches of study:**

Code No.	Branch
701	Civil Engineering
702	Information Technology
703	Electrical and Electronics Engineering
704	Computer Science
705	Electronics and Communications
706	Mechanical Engineering

- 5. Methodology:** The methodology of distance education includes the supply of self-instructional study materials in print format and in CD, face-to-face instruction for theory and practicals for a limited period during week-ends and on holidays, provision of virtual class in phased

manner, dissemination of information over e-mail, Student - Support Service at various Centres of the University, Continuous Assessment and End Assessment conducted by the University at various parts of India.

6. Weightage for Continuous and End Assessment: There is no weightage for Continuous Assessment (CA) unless the ratio is specifically mentioned in the scheme of Examinations. The End Assessment (EA) has 100% weightage.

7. Scheme of Examinations:

I SEMESTER

S.No.	Subject Title	Examination Marks	
		EA Marks	Total Marks
109DTT01	Communication English-I	100	100
109DTT02	Mathematics	100	100
109DTT03	Engineering Physics-I	100	100
109DTT04	Engineering Chemistry-I	100	100
109DTT05	Engineering Graphics	-	-
109DTP01	Physics Practical	-	-
109DTP02	Chemistry Practical	-	-
109DTP03	Computer Application	-	-
109DTP04	Workshop Practice	-	-
	TOTAL	400	400

II SEMESTER

S.No.	Subject Title	Examination Marks	
		EA Mark	Total Marks
209DTT01	Communication English-II	100	100
209DTT02	Applied Mathematics	100	100
209DTT03	Engineering Physics-II	100	100
209DTT04	Engineering Chemistry-II	100	100
209DTT05	Engineering Graphics	100	100
209DTP01	Physics Practical Record	90 10	100
209DTP02	Chemistry Practical Record	90 10	100
209DTP03	Computer Application Record	90 10	100
209DTP04	Workshop Practice Record	90 10	100
	TOTAL	900	900

8. Passing Requirements: The minimum pass mark be 40% in theory examinations and 50% in practical examinations.

9. Classification of successful candidates:

All the successful candidates are classified as follows.

Aggregate Marks(percentage)	Classification
75 and above	First Class with honours
60 to 74.99	First Class
All other Successful Candidates	Second Class

10. Pattern of the Question Paper for Theory Subjects: The question paper for End Assessment will be set for three hours and for the maximum of 100 marks with following divisions and details.

Part A: 10 questions (with equal distribution to all units in the syllabus).
Each question carries 2 marks.

Part B: 5 questions with either or type (with equal distribution to all units in the syllabus). Each question carries 16 marks.

The total marks scored by the candidates will be reduced to the maximum prescribed in the Regulations.

11. Syllabi.

109DTT01 – COMMUNICATION ENGLISH – I (I Semester)

OBJECTIVES:

At the end of the course of study, the students will be able to:

- (1) Acquire proficiency in the four major skills of communication viz.
(i) reading (ii) listening (iii) writing and (iv) speaking towards successfully integrating all of the four skills for the effective use of English in communication, besides a source of inspiration for developing their aesthetic skills and thinking faculty.
- (2) Improve their vocabulary and enable them to use the words appropriately in different academic and professional contexts.
- (3) Acquire skills in reading and understanding the different types of texts and inculcate some of their inherent features.
- (4) Develop strategies that could be adopted while reading different types of texts.

TOPICS:

PART	Topics
A.	Grammar (Non-Textual)
B.	Composition
C.	Speaking Practice

PART A GRAMMAR

- (1) Functional Analysis
- (2) Parts of Speech
- (3) Voice (Active voice to Passive voice and Passive voice to Active voice)
- (4) Direct & Indirect speech (Direct to Indirect and Indirect to Direct)
- (5) Infinitives and Gerunds
- (6) Preposition
- (7) One-word substitute
- (8) Question tag
- (9) Articles
- (10) Correction of Sentences
- (11) Prefixes
- (12) Suffixes
- (13) Tenses

PART B COMPOSITION

- (1) Comprehension
(Simple passages relating to topics like environment, moral story, science and technology etc.)
Letter writing - Personal Letters
(Letter to your friend inviting him to your birthday party / Letter to your father asking him to permit you to join an education tour / Letter from a son/daughter to his/her father stating how he/she hopes to fare in the approaching Diploma Examinations / Letter to your friend offering your suggestions as to what to do after completing the Diploma Course)
- (2) Dialogue writing
- (3) Hints Development

PART C Speaking Practice (Continuous Assessment)

Initially some kind of speaking practice in the I year will enable the students to effectively undergo the English Communication Practical course, which will be introduced in the III and IV semesters of the Diploma Course.

Speaking practice is intended to improve the skill of the students in oral expression. The practice of speaking in English should be encouraged in all possible ways.

The students must be given practice in the following areas :

- Listening practice
- Introducing oneself/others
- Expressions of courtesy
- Expressing agreement /disagreement

For giving speaking practice, the existing facilities and infrastructure in the English Communication Laboratory can be effectively utilised.

REFERENCE:

- (1) A.S. Hornby, 'The Advanced Learners Dictionary of Current English', Oxford University Press. 1973.
- (2) Wren & Martin, 'High School English Grammar and Composition', S. Chand & Co. Ltd., 2005.
- (3) Glennis Pye, 'Vocabulary in Practice - Part 1 to 4', Cambridge University Press, 2004.
- (4) Shiv K. Kumar & Hemalatha Nagarajan, 'Learn Correct English', Pearson Longman, 2005.
- (5) Raymond Murphy, 'Essential English Grammar', Cambridge University Press, 1990.
- (6) M.Thomas, 'Common Errors in English', Lotus Press, New Delhi, 2006.
- (7) Michael Swan, 'Basic English Usage', ELBS/OUP, 1989.

109DTT02 – MATHEMATICS

(I Semester)

OBJECTIVES:

At the end of the course of study, the student will be able to

- (1) Explain the basics of determinants and matrices and to solve linear equations in engineering oriented problems.
- (2) Acquire the basic knowledge in binomial to find the approximations of infinite expansions both algebraically and numerically.
- (3) Explain the concept of complex numbers, De-moivre's theorem and its application to solve equation.
- (4) Explain the concepts of straight lines, circles and family of circles.
- (5) State the trigonometric formulae and apply the same in differential and integral calculus.
- (6) Highlight the concept of limits and differentiation.

TOPICS

Unit	Topics
1.	gebra
2.	Complex Number
3.	Analytical Geometry
4.	Trigonometry
5.	Differential calculus

Unit-1: Algebra

1.1 Determinants:

Expansion of determinants upto third order only – problems involving properties of determinants – solution of simultaneous equations using Cramer's rule

1.2 Matrices:

Introduction – Definition – Types of matrices – Operations on matrices – Inverse of a matrix upto 3 X 3 only – Solution of simultaneous equation using matrix inverses.

1.3 Binomial Theorem:

Introduction to permutation and combination – Definitions – Values of npr and ncr (results only) [not for examination] Binomial theorem for a positive integral index (statement only) – (Finding general term, middle term, coefficient of x^k and term independent of x). Binomial theorem for rational index (statement only) – Expansion only for negative integers upto -3 .

Unit-2: Complex Numbers

2.1 Definition, real and imaginary parts, conjugates, modulus and amplitude form, multiplication and division of complex numbers (Geometrical proof not necessary). Argand Diagrams – Collinear points, four points forming square, rectangle, rhombus and parallelogram only. Simple problems

2.2 Demoivre's theorem (statement only) - related problems.

2.3 Finding the n^{th} roots of unity Solving equations of the form $x^n \pm 1 = 0$ ($n \leq 7$)

Unit-3: Analytical Geometry

3.1 Pair of straight lines:

Pair of lines passing through origin – $ax^2 + 2hxy + by^2 = 0$, expressed in the

form $(y - m_1x)(y - m_2x) = 0$. Derivation of $\tan \theta = \pm 2 \frac{\sqrt{h^2 - ab}}{a + b}$

Condition for the lines to be coincident and perpendicular – related problems.

General equation of the second-degree $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$, to represent pair of straight lines. Condition for second degree equation to represent pair of lines.

Condition $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$ (Statement only).

Problems related to the above result.

- 3.2 Circles: Equation of circle – Given centre and radius – General equation of circle – Finding centre and radius, equation of circles through three non-collinear points, equation of circle described on the line joining the points (x_1, y_1) and (x_2, y_2) as diameter (results only) – simple problems
- 3.3 Family of Circles: Length of tangent and equation of tangent (result only). Concentric circles, contact of circles, orthogonal circles – Condition for orthogonal circles (result only). Simple problems.

Unit - 4: Trigonometry

- 4.1 Compound Angles: Expansion of $\sin(A \pm B)$, $\cos(A \pm B)$ and $\tan(A \pm B)$ [without proof] problems involving the above expansions.
- 4.2 Multiple Angles: Trigonometrical ratios of multiple angles (2A and 3A only) and sub-multiple angles – Simple problems.
- 4.3 Sum and Product formulae: Simple problems using sum and product formulae. Identities – simple problems.

Unit-5: Differential Calculus

- 5.1 Limits: Standard results $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = n a^{n-1}$, $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$
 (θ in radians) (without proof) – problems using the above results.

Differentiation: Definition – Differentiation of x^n , $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\sec x$, $\operatorname{cosec} x$, $\log x$, e^x , $u \pm v$, $kv + c$, uv , uvw , u/v (results only).

Problems using the above results

- 5.2 Differentiation methods: Differentiation of function of functions – Inverse trigonometric functions – Implicit functions.
- 5.3 Successive differentiation: Successive differentiation and formation of differential equations up to second order only.

Reference:

- (1) Higher Secondary – First Year – Tamil Nadu Text Book Corporation
- (2) Engineering Mathematics – Dr.M.K.Venkatraman, National Publishing Co, Chennai.
- (3) Engineering Mathematics – Dr. P. Kandasamy & Others, Schand & Co Ltd., New Delhi.

109DTT03 – ENGINEERING PHYSICS – I (I Semester)

OBJECTIVES:

At the end of the course of study the student will be able to

- (1) Acquire the basic knowledge of SI units both fundamental and derived.
- (2) State the basic laws of forces acting at a point and on rigid bodies and mention its applications
- (3) Explain viscous force and surface tension
- (4) Get a thorough understanding of projectile and circular motion and mention its application
- (5) Explain the concepts of satellites and remote sensing
- (6) Acquire knowledge about the various types of sound waves
- (7) Solve simple problems connected with the course of study

TOPICS:

Unit	Topics
1	S.I. Units and Statics
2	Properties of Matter
3	Dynamics
4	Rotational Motion and Satellites
5	Remote Sensing and Sound

UNIT - 1: S.I UNITS, STATICS

1.1 S.I Units:

Fundamental quantities: Length, Mass, Time.

Derived quantities: Area, Volume, Velocity, Acceleration, Momentum, Force, Impulse, Power and Energy. S I Units of Base and Supplementary units-conventions- multiples and sub-multiples of units Dimensional formula

1.2 Statics:

Concurrent forces: Definitions of Scalar and Vector-examples. Resolution of a vector into two rectangular components- Parallelogram law of forces-Statement- Derivation of expressions for magnitude and direction of resultant of two forces at a point with an acute angle between them- Lami's theorem- Statement - Experimental verification of Parallelogram law of forces and Lami's theorem

(Direct and Simple Problems may be asked)

Unit - 2: PROPERTIES OF MATTER

2.1 Properties of Matter:

Elasticity: Definitions- stress and strain- Statement of Hooke's law-Definitions of Young's modulus, Bulk modulus and Rigidity modulus- Experimental verification of Young's modulus by uniform bending - Torsion pendulum - Experiment to find the Moment of Inertia of the disc and Rigidity modulus of the wire by using symmetrical masses.

Viscosity: Definition of Stream line and turbulent motions- Definition of co-efficient of viscosity- Experimental comparison of viscosities of two liquids - Definition of Terminal velocity- Experiment to determine the coefficient of viscosity by Stoke's method.

Surface tension: Definitions of surface tension and angle of contact- Derivation of the formula for surface tension of liquid by Capillary rise method- Experiment to determine surface tension of water.

(Direct and Simple Problems may be asked)

Unit -3: DYNAMICS

3.1 Projectile Motion:

Definition of a projectile motion- Definitions of Angle of projection, trajectory, time of flight and range- Expressions for maximum height, maximum range and time of

flight- Derivation of the equation to show that the path of the projectile is a parabola.

3.2 Circular Motion:

Definition of a Circular motion and Angular velocity- Relation between linear velocity and angular velocity- Definition of Normal acceleration- Derivation of normal acceleration- Definition of Centripetal force- Derivation of Centripetal force- Definition of Centrifugal force.

3.3 Application of Circular Motion:

Banking of Curved tracks- Definition of Angle of banking- Expression for the angle of banking of a railway track ($\tan\theta = v^2/rg$)

(Direct and simple problems may be asked)

Unit – 4

4.1 Rotational Motion of Rigid Bodies:

Definition of Moment of inertia of a Particle and a Rigid body- Definition of Radius of Gyration- Derivation of Kinetic energy of a rigid body rotating about an axis- Definition of Angular momentum- Derivation of expression for angular momentum- Law of Conservation of angular momentum .

4.2 Satellite:

Kepler's laws - Definitions for Escape velocity and Orbital velocity- Expression for Escape velocity - Expression for orbital velocity.

(Direct and simple problems may be asked)

Unit - 5

5.1 Remote sensing:

Introduction- Active and Passive remote sensing- Components of remote sensing- Data acquisition, Data analysis, Reference data- Electro Magnetic spectrum- Microwave remote sensing- Radar- Indian remote sensing satellite.

5.2 Sound:

Definitions of longitudinal waves, transverse waves, Progressive waves, Stationary waves, Wave length-Frequency and Velocity- Laws of vibration in stretched strings- Resonance - Sonometer – Experiment to determine the frequency of a tuning Fork. Acoustics of buildings: Reverberation- Reverberation time- Echo- Coefficient of absorption of sound energy.

(Direct and simple problems may be asked)

Reference:

1. Resnick and Hoilday - Physics – Wisley Toppan Publishers – England
2. Narayana Kurup – Mechanics - S. Chand Publishers – New Delhi
3. B.L. Theraja – Engineering Physics – S. Chand Publishers – New Delhi
4. Dr.M.Anji Reddy – Remote sensing – Jawaharlal Nehru Technological University – Hyderabad.

209DTT01 – COMMUNICATION ENGLISH – II (II Semester)

OBJECTIVES

At the end of the course of study, the students will be able to

- (1) Acquire proficiency in the four major skills of communication viz. (i) reading (ii) listening (iii) writing and (iv) speaking towards successfully integrating all of the four skills for the effective use of English in communication, besides a source of inspiration for developing their aesthetic skills and thinking faculty.
- (2) Improve their vocabulary and enable them to use the words appropriately in different academic and professional contexts.
- (3) Acquire skill in reading and understanding the different types of prescribed lesson units and inculcate some of their inherent features.
- (4) Develop strategies that could be adopted while reading a text book
- (5) Read out the lessons to realize the role of word-order, choice of words, specific functions of structural words, understand the content and consequently acquire proficiency in skimming and rapid and silent reading.

TOPICS

PART	Topics
A.	Grammar (Non-Textual)
B.	Composition
C.	Speaking Practice

PART - A GRAMMAR

1. Transformation of sentences (Interrogative into assertive and Exclamatory into assertive)
2. Changing a sentence into negative without changing the meaning.
3. Removing 'Too.....to' and replacing it with 'so thatnot'
4. Removing 'as soon as' and replacing it with 'no sooner than'
5. Degrees of Comparison

6. Simple, Compound and Complex sentences
(Simple into complex and vice versa)
7. Simple, Compound and Complex sentences
(Simple into compound and vice versa)
8. Rewriting a sentence with 'it' in the initial position
9. Rewriting a sentence with 'There' in the initial position
10. Answering the verbal questions in affirmative and negative
11. Rearranging the following words to form a meaningful sentence
12. Synonyms and Antonyms
 - .. Forming meaningful sentences for the words given. (Words to be selected from the enclosed list)

PART – B COMPOSITION

- (i) Conversion of Graphics (Pie-Chart, Bar-Chart, Table)
- (ii) Letter writing – Business and Official letters
(Letter inviting quotations, Letter of quotation, Letter placing orders. Request for leave/Bonafide Certificate/Testimonials/Applying for a job with bio-data/Curriculum Vitae)
- (iii) Report writing (Technical Reports)
(Market report, Investigation report, Field report)
- (iv) Creative writing

PART – C Speaking Practice : (Continuous Assessment)

Initially some kind of speaking practice in the I year will enable the students to effectively undergo the English Communication Practical course, which will be introduced in the III and IV semesters of the Diploma Course. Out of 25 marks meant for Continuous assessment, 10 marks is allotted to assess the spoken skills of the students and for assignments, 10 marks for periodical tests.

Speaking practice is intended to improve the skill of the students in oral expression. The practice of speaking in English should be encouraged in all possible ways.

The students must be given practice in the following areas :

- Listening practice
- Asking for / giving information
- Describing objects
- Describing situations
- Role play

For giving speaking practice, the existing facilities and infrastructure in the English Communication Lab. can be effectively utilised.

REFERENCES:

- (1) A.S. Hornby, 'The Advanced Learners Dictionary of Current English', Oxford University Press. 1973.
- (2) Wren & Martin, 'High School English Grammar and Composition', S. Chand & Co. Ltd., 2005.
- (3) Glennis Pye, 'Vocabulary in Practice - Part 1 to 4', Cambridge University Press, 2004.
- (4) Shiv K. Kumar & Hemalatha Nagarajan, 'Learn Correct English', Pearson Longman 05.
- (5) Raymond Murphy, 'Essential English Grammar', Cambridge University Press, 1990.
- (6) M. Thomas, 'Common Errors in English', Lotus Press, New Delhi, 2006
Michael Swan, 'Basic English Usage', ELBS/OUP, 1989.

209DTT02 – APPLIED MATHEMATICS

(II Semester)

OBJECTIVES:

At the end of the course of study, the student will be able to

- (1) Acquire the basic knowledge in vectors to apply in force analysis.
- (2) Explain the concept of integral calculus
- (3) Explain the physical and geometrical applications of differentiation
- (4) Explain the applications of integration and to know to solve differential equations.
- (5) Acquire the basic knowledge in probability distribution.

TOPICS:

Sl. No	Topics
1.	Vector Algebra
2.	Integral Calculus
3.	Application of Differentiation
4.	Application of Integration
5.	Probability Distribution

Unit – 1: Vector Algebra

1.1 Introduction:

Definitions, Types, Addition, and Subtraction of Vectors. Properties, position vector, resolution of vector in two and three dimensions. Direction cosines and direction ratios of vectors. Simple problems.

1.2 Product of Vectors:

Scalar and vector product of two vectors – Geometrical meaning – Angle between two vectors – Unit vector perpendicular to two vectors.

1.3 Applications of vectors:

Work done-moment-Scalar and vector triple product- Geometrical interpretation of scalar triple product –Coplanar vectors. Scalar and vector product of four vectors. Simple problems.

Unit – 2: Integral Calculus

2.1 Integration:

Definition – Integral values using reverse process of differentiation. Integration using decomposition method. Integration by substitution – Integrals of the form

$$\int [f(x)]^n f'(x) dx, \quad n \neq -1, \quad \int \frac{f'(x)}{f(x)} dx, \quad \int F(f(x))f'(x) dx$$

2.2 Standard Integrals:

Integral of the form $\int \frac{dx}{(a^2 \pm x^2)}$, $\int \frac{dx}{x^2 - a^2}$, $\int \frac{dx}{\sqrt{a^2 - x^2}}$, $\int \frac{dx}{(x+a)(x+b)}$, $\int \frac{(Ax+B)dx}{ax^2 + bx + c}$

– simple problems.

2.3 Integration by parts:

Integration by parts and Bernoulli's form to evaluate

$$\int x \sin nx dx, \int x \cos nx dx, \int x^2 e^{ax} dx, \int x^n \log x dx, \int \log x dx.$$

Unit – 3: Application of Differentiation

3.1 Velocity and Acceleration, Tangents and Normals – Simple Problems.

3.2 Maxima and Minima of single variable – Simple Problems.

3.3 Partial differentiation of two variables upto second order only- Euler's Theorem- Simple Problems.

Unit – 4: Application of Integration

4.1 Definite Integral. Area and Volume – Area of circle, volume of sphere and cone – Simple Problems.

4.2 Solution of differential equations- Variable separable - linear type differential equations- simple problems.

4.3 Second order differential equation with constant coefficients.

$$a \frac{d^2 y}{dx^2} + b \frac{dy}{dx} + cy = e^{ax} \text{ Where } f(a) \neq 0.$$

Unit – 5: Probability Distributions

5.1 Random variable: Types of random variable – Definition of Discrete Random Variable, Probability mass function, continuous random variable and probability density function- Simple problems.

Mathematical expectation of discrete random variable. Simple problems.

5.2 Discrete Distributions

Binomial distribution:

$$p(X = x) = \begin{cases} nC_x p^x q^{n-x} & x = 0,1,2,\dots,n \\ 0 & \text{otherwise} \end{cases}$$

Statement only -

Expression for mean, variance and standard deviation - simple problems.

Poisson Distribution:

Definition of Poisson distribution

$$p(X = x) = \begin{cases} \frac{e^{-\lambda} \lambda^x}{x!} & x = 0,1,2,\dots \\ 0 & \text{otherwise} \end{cases}$$

Statement only. Expression for mean, variance and standard deviation - Simple problems.

5.3 Continuous Distribution:

Normal Distribution: Definition of normal and standard normal distribution.

Statement only. Constants of normal distribution (results only) - Properties of normal distribution – Simple problems using the table for standard normal distribution

Reference:

- (1) Higher Secondary – Second Year – Tamil Nadu Text Book Cooperation.
- (2) Engineering Mathematics–Dr. M. K. Venkatraman, National Publishing Co, Chennai.
- (3) Engineering Mathematics – Dr. P. Kandasamy & Others, Schand & Co Ltd., New Delhi.

209DTT03 ENGINEERING PHYSICS II (II Semester)

OBJECTIVES:

At the end of the programme, the student will be able to

- (1) Acquire the basic knowledge in heat
- (2) Explain the isothermal and adiabatic changes
- (3) Explain the process in the liquefaction of gases
- (4) Get an understanding of various non-conventional energy sources and their uses
- (5) Explain the concepts in electricity and electronics and list out their applications
- (6) State the various laws connected with heat, light, magnetism and electricity

TOPICS

Unit	Topics
1	Heat
2	Liquefaction of Gases and non Conventional Energy
3	Light and Magnetism
4	Electricity
5	Chemical effect of Current, Capacitors and Electronics

Unit -1: Heat

1.1 Heat - Kinetic Theory of Gases:

Postulates- Derivation of pressure of a gas- Relation between pressure and kinetic energy- Deduction of Boyle's law and Charle's law from the equation $p = \frac{1}{3}mnc^2$

1.2 Specific Heat:

Definitions of specific heat capacity of a solid, liquid, gas- Specific heat capacity of a gas at constant volume – Specific heat capacity of a gas at constant pressure- Derivation of Mayer's relation -Calculation of R using $PV=RT$

1.3 Isothermal and Adiabatic Changes:

Explanation of Isothermal and Adiabatic changes.

(Direct and simple problems may be asked)

Unit -2

2.1 Liquefaction of Gases:

Definition of Critical temperature, Critical pressure and Critical volume- Temperature of Inversion- Joule Thomson Effect- Experiment to Liquefy the Gases – Linde's process – cascade process.

2.2 Non Conversional Energy:

Renewable and Non-renewable sources of energy- Examples- Advantages and disadvantages- Alternate sources of Energy-Solar, Wind, Tidal, Geothermal, Hot dry rock and Bio mass. (Direct and simple problems may be asked)

Unit-3

3.1 Light:

Optical Instruments - Principle of Sextant – Sextant - Elevation and Height of the Building. Spectrometer – Description - Derivation of the expression for the Refractive Index of the material of the prism using angle of minimum deviation- Laser principle-Ruby Laser-Construction and Working- uses

3.2 Magnetism:

Definitions of pole strength, Magnetic moment- Magnetic induction (B), Intensity of magnetic field(H) -Permeability- Intensity of magnetism(M) and Hysteresis- Experiment to draw Hysteresis Loop- Definition of Retentivity, Coercivity and

Saturation- Selection of magnetic materials for permanent and temporary magnets.

Unit-4

ELECTRICITY

4.1 Electrical Circuits:

Ohm's law – Laws of resistance – Resistivity - Kirchoff's laws- Statements and explanation –Wheat Stones Bridge

4.2 Force on a moving charge and measuring Instruments:

Force on a current carrying straight conductor- Fleming's left hand rule- Torque on a rectangular coil carrying current placed in a magnetic field- Moving coil galvanometer- Conversion of galvanometer into Voltmeter and Ammeter.

4.3 Heating Effect of Electric Current:

Joule's law of heating effect - Determination of specific heat capacity of liquid. Applications: Working principle of fuse wire and heating element.

(Direct and Simple Problems may be asked)

Unit – 5

5.1 Chemical Effect of Electric Current:

Faraday's law of electrolysis- Definition of e.c.e of an element

Application: Electroplating- experiment to determine e.c.e of copper.

5.2 Capacitor:

Definition of capacitance of a Capacitor - Capacitors in series and Capacitors in parallel.

5.3 Electronics:

Semiconductors – Doping-P Type and N Type semiconductors-PN Junction –Full wave Rectifiers- PNP And NPN Transistors –Common base configuration- Logic Gates- OR, AND, NOT, NAND NOR, And Ex-NOR Gates- Integrated Circuits IC-SSI, MSI, LSI, and VLSI

Reference:

1. Srivastava – Electricity and Magnetism – S. Chand Publishers – New Delhi.
2. J.B. Rajam – A Text Book of Heat - S. Chand Publishers – New Delhi.
3. G. D. Rai – Non- Conventional Energy Sources – Khanna Publishers – New Delhi.

**209DTT04 – ENGINEERING CHEMISTRY – II
(II Semester)****OBJECTIVES:**

At the end of the programme, the student will be able to

- (1) Explain the concepts of Fission, Fusion reaction and mention the applications of isotopes in Industries
- (2) Explain the various types of Fuels including Rocket propellants
- (3) Explain the Rain Water Harvesting, softening of Hard Water for Industrial purposes
- (4) Explain the Organic Polymers like Plastics, Rubber and their applications
- (5) Explain the Metallurgy of Tungsten, Titanium and applications of alloys
- (6) Explain the various Engineering materials like Refractories, Abrasives

TOPICS:

Unit	Topics
1	Nuclear Chemistry, Abrasives
2	Fuels, Refractories
3	Technology of Water, Lime
4	Plastics, Rubber
5	Metallurgy,Alloys

UNIT – 1

1. Nuclear chemistry - Radio activity - definition-alpha, beta, gamma rays-properties-isotope-isobar-definition – example - radio active decay-alpha, beta decay examples- Group displacement law - Half life period- definition - simple problems - Nuclear fission – fission of U235- Fusion-reaction in SUN – artificial radioactivity-definition - examples-Definitions of nuclear reactor, reactor core, reflector, pressure vessel, shielding, heat exchanger &turbine - Applications of

radio active isotopes in industries.

2. Abrasives – Definition – classification - hardness in mohs scale - natural abrasives - Diamond, Corundum, Emery, Garnet-synthetic abrasives - Carborundum - Boron carbide-manufacture-uses

UNIT - 2

1. Fuels - Definition-calorific value - classification-solid fuels-wood-varieties of coal-composition-specific uses-liquid fuels-petroleum-fractional distillation and their uses-cracking(concept only)-gaseous fuels-preparation and specific uses of producer gas, water gas, bio gas-LPG-composition and uses -advantages of gaseous fuels.

Rocket Propellants – Definition – Characteristics – Classification of Propellants - brief account of Solid & Liquid propellants with example.

2. Refractories – Definition – requirements - classification with examples & uses - uses of fireclay bricks – aluminabricks - silicabricks.

UNIT - 3

1. Technology of Water – sources - depletion of underground water - reasons - Rain water harvesting - (basic ideas)-advantages - hard and soft water-carbonate, non carbonate hardness-methods of expressing hardness-mg / lit, ppm-simple problems-estimation of Total hardness by EDTA method – problems involving total, carbonate, non-carbonate hardness in ppm softening of hard water- ion exchange, reverse osmosis methods - water for drinking purpose-purification (sedimentation, filtration, sterilization) - Disadvantages of hard water in boilers-scale formation and corrosion.

2. Lime lime-types-manufacture of Hydraulic lime by continuous vertical kiln process-properties-slaking-plasticity-setting.

UNIT - 4

1. Plastics – Types - thermoplastics, thermo set plastics – differences - mechanical properties -advantage over traditional material (wood & metals) - specific uses of bakelite, PVC, nylon, urea formaldehyde.-reinforced or filled plastics-definition-advantages – applications - polymers in surgery – biomaterial – definition - Bio medical uses of polyurethane, pvc, polypropylene, polyethylene.

2. Rubber - Natural rubber- preparation from latex-defects of natural rubber-compounding- ingredients &their functions- vulcanization (No equation) -purpose-synthetic rubber-Buna-S, Thiokol, Neoprene (Preparation & specific uses only - no equation) reclaimed rubber - definition-process -properties-uses

UNIT – 5

1. Metallurgy - metallurgy of Tungsten &Titanium and their uses - powder metallurgy – definition-industrial applications.

2. Alloys – Definition - purpose of alloying - Non ferrous alloys – Definition - composition and Uses of Nickel alloys - Ni chrome, Inconel- Copper Alloys – composition and uses of – Brass - Dutch metal – German silver - Bronze –Coinage bronze – Gunmetal - Aluminium Alloys – composition and uses of – Duralumin – magnalumin

Industrial Visits to Effluent treatment plants, Abrasive Industries, Water treatment plants etc are desirable for better understanding.

209DTT05 – ENGINEERING GRAPHICS (I & II Semesters)

OBJECTIVES:

At the end of the course of study, the student will be able to

- (1) State the importance of Engineering Drawing.
- (2) Identify the drawing instruments.
- (3) Demonstrate the methods of dimensioning.
- (4) Construct conics and curves.
- (5) Draw orthographic views from isometric drawings.
- (6) Draw projection of solids.
- (7) Draw sectional views of solids.
- (8) Convert orthographic views to isometric drawings.
- (9) Prepare development of surfaces of objects.
- (10) Prepare engineering drawings using AutoCAD software.
- (11) State the advantages of AutoCAD software.

TOPICS:

Unit	Topics
1.1	Drawing office Practice
1.2	Geometrical Constructions, conics and
2	Orthographic Projections
3	Projection of Solids and Section of Solids
4	Pictorial drawings
5	Development of surfaces
6	Practice on AutoCAD

Unit - 1

1. 1. Drawing Office Practice:

1.1.1 Importance of Engineering Drawing as a graphic communication - drawing practice as per BIS code -Drawing Instruments: Drawing Board, Mini Drafter, Drawing Instruments like compass, divider, protractor, drawing sheets etc.

1.1.2 Importance of Legible lettering and numbering - single stroke letters - upper case and lower case letters- general procedures for lettering and numbering-height of letters-guidelines.

1.1.3 Dimensioning - need for dimensioning-terms and notations as per BIS - Dimension line, Extension line and Leader line- methods of placement of dimensions--Importance of dimension rules.

1.1.4 Scales - Study of scales-full size scale, reduced scale and enlarged scale.

1. 2. Geometrical Constructions, conics and geometrical curves :

1.2.1 Conics: Different types - Explanation of locus, focus and directrix-Application of ellipse, parabola and hyperbola - Ellipse: Construction of ellipse by concentric circle method, rectangular method when major axis and minor axis are given - Parabola: Construction by rectangular method-construction of ellipse, parabola and hyperbola when eccentricity is given.

1.2.2 Geometric curves: Definition, Application and construction of involute, archimedian spiral, helix, cycloid (Circle rolling on a straight line).

Unit-2

2. Orthographic Projection

Projection of simple objects in three views - exercise in drawing (Half size and Full size) Practice in first angle projection only.

Unit-3

3. Projection of Solids and Section of Solids

3.1 Projection of simple solids - cube, prism, cylinder, cone and pyramids.

- i. Axis perpendicular to one plane and parallel to another plane.
- ii. Axis parallel to both planes
- iii. Axis parallel to one plane and inclined to another plane.

3.2 Sectional view - need for sectional view-cutting plane-cutting plane line-representation as per I.S. code- hatching-section of simple solids, cube, prism, cylinder, cone with axis vertical, when the cutting plane is

- i. Parallel to one plane and perpendicular to other plane
- ii. Inclined to one plane and perpendicular to other plane.

Unit-4

4. Pictorial drawings

4.1 Isometric Drawings - Conversion of orthographic views into isometric drawings.

Unit-5

5. Development of Surfaces

5.1 Need for preparing development drawing with reference to sheet metal work - Development of cube, cylinder, square and hexagonal prism, square and hexagonal pyramids, frustum of pyramids and cones and pipe connections such as 'Tee' and 'Elbow'.

Unit-6

6. Practice on AutoCAD

6.1 AutoCAD commands - Draw commands-line, circle, arc, polygon, ellipse, rectangle-Edit Commands-Dimension commands.

6.2 Exercise: Write the AutoCAD commands for the exercises given below.

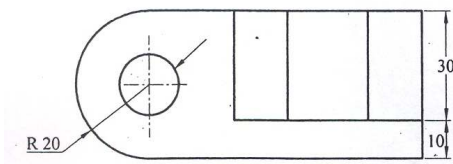


Fig.1

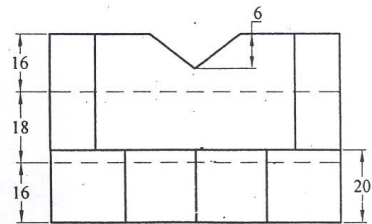


Fig.2

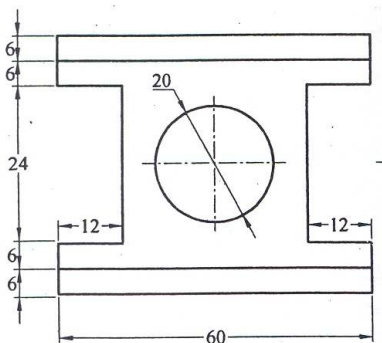


Fig. 3

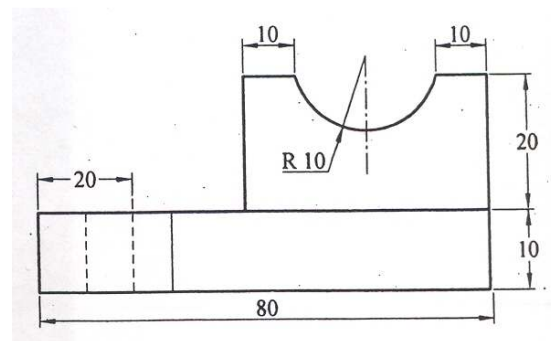


Fig. 4

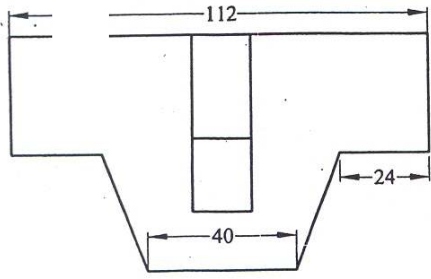


Fig. 5

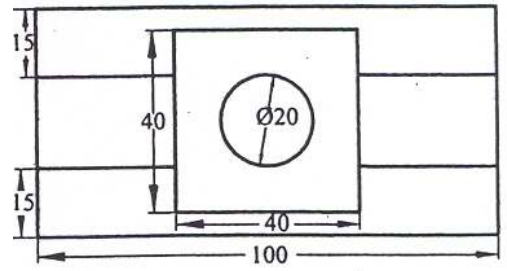


Fig. 6

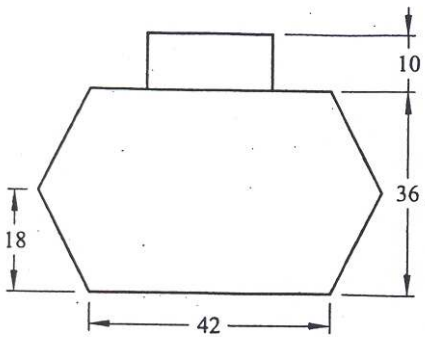


Fig. 7

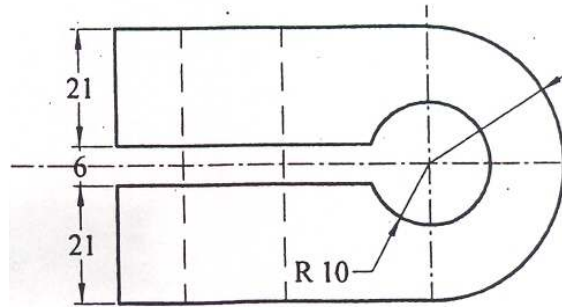


Fig. 8

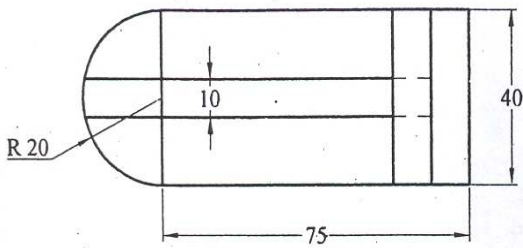


Fig. 9

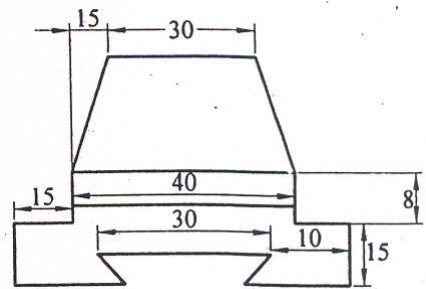


Fig. 10

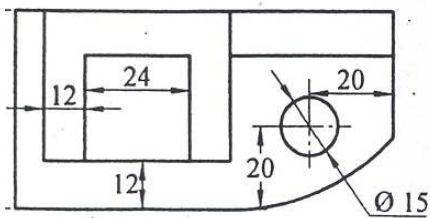
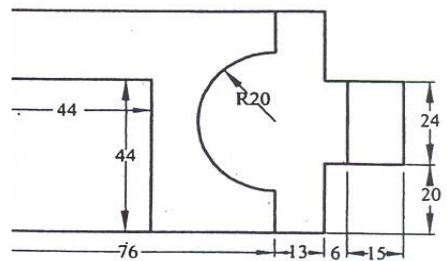


Fig. 11



End Assessment (3 hours)	Marks
Part-A (Units 1, 3, 4 & 5)	3 x 10 = 30
Any three out of four	
Part-B (Unit 2)	35
Part-C (Unit 6)	10

Total	100

Reference:

- (1) Gopalakrishnan. K. R., "Engineering Drawing", (Vol.I and Vol.II), Dhanalakshmi publishers, Edition 2, 1970.
- (2) Barkinson & Sinha, "First Year Engineering Drawing" Pitman Publishers, London, Edition 3, 1961.
- (3) Francis Soen, David Pitzer and Howard M.Fulmer, "AutoCAD Release 13 for Windows and Windows NT", Prentice-Hall of India Pvt. Ltd., New Delhi 110 001, Indian Reprint, 1996.

109DTP01/209DTP01 – PHYSICS PRACTICAL

(I & II Semesters)

OBJECTIVES:

At the end of the programme, the student will be able to

- (1) Measure the length, thickness using vernier caliper and screw gauge.
- (2) Verify the laws of forces.
- (3) Determine the acceleration due to gravity and modulus of elasticity using pendulums.
- (4) Determine the coefficient of viscosity and surface tension.
- (5) Develop skills in using instruments like spectrometer and deflection magnetometer.
- (6) Apply principles of electricity by doing experiments like copper voltameter, joules calorimeter, potentiometer etc.
- (7) Explain how the solar cells function.

EXAMINATION EVALUATION:

	Marks
(1) Continuous Assessment	25
(2) Formula	10
(3) Tabular Column and circuit diagram	10
(4) Observations	30
(5) Calculation	15
(6) Result	5
(7) Viva-voce	5
Total	100

- 1 VERNIER CALIPERS - To find the volumes of the solid cylinder and hollow cylinder using vernier callipers.
- 2 SCREW GAUGE – To find the thickness of (a) glass plate (b) given sphere using screw gauge. Hence calculate the volume of the glass plate and the sphere.

- 3 SIMPLE PENDULUM – To find the acceleration due to gravity in the laboratory, using simple pendulum. Calculate the acceleration due to gravity, by $L-T^2$ graph.
- 4 CONCURRENT FORCES -To verify the parallelogram law of forces and Lami's theorem.
- 5 COPLANAR – PARALLEL FORCES – To verify the conditions of the Co-planar parallel forces.
- 6 TORSION PENDULUM – To find the rigidity modulus of the thin wire and moment of inertia of the disc by using symmetric masses.
- 7 COMPARISON OF VISCOSITIES – To compare the coefficient of viscosities of two liquids by capillary flow method.
- 8 VISCOSITY OF A HIGHLY VISCOUS LIQUID – To find the coefficient of viscosity of a highly viscous liquid.
- 9 SURFACE TENSION – To find the surface tension of the given liquid by capillary rise method.
- 10 YOUNG'S MODULUS – To find the young's modulus of the material of the given metre scale.
- 11 SPECTROMETER – 1. To find the angle of the prism.
- 12 SPECTROMETER – 2. To find the refractive index of the material of the prism.
- 13 DEFLECTION MAGNETOMETER – To compare the magnetic moments of two given magnets by (a) Equal distance method and (b) Null method.
- 14 SONO METER – To find the frequency of the given tuning fork.

- 15 JOULE'S CALORIMETER – To determine the specific heat capacity of the given liquid.
- 16 COPPER VOLTAMETER – To determine electro – chemical – equivalent of copper.
- 17 OHM'S LAW – To determine the resistance of two given coils of wire using Ohm's law. Also verify the laws of resistances.
- 18 POTENTIO METER – To compare the e.m.fs of two given cells.
- 19 PN JUNCTION DIODE – For the given semiconductor diode draw (a) Forward bias (b) Reverse bias characteristic curves.
- 20 SOLAR CELLS – V. I. Characteristics.

109DTP02/209DTP02 - ENGINEERING CHEMISTRY PRACTICAL

OBJECTIVES:

At the end of the programme, the student will be able to

- (1) Identify the Acid, and Basic Radicals in a given chemical substance like pollutant, fertilizer, fungicide, mordant, lime stone, electrolyte, gypsum, epsom.
- (2) Analyse effluent to find out the presence of heavy metals and to know their bad effect.
- (3) Explain volumetric analysis in Acidimetry, Alkalimetry, Permanganimetry
- (4) Explain how estimation of Hardness present in the Water
- (5) Explain the measurement of pH in various solutions

EXAMINATION EVALUATION:

(1) Continuous Assessment	: 25 marks
(2) Volumetric Analysis	: 40 marks
(3) Analysis of chemical substance	: 30 marks
(4) Viva-voce	: 05 marks

TOTAL

100 marks

1. Qualitative Analysis:

Study of the reactions of the following radicals leading to qualitative analysis of the given CHEMICAL SUBSTANCE soluble in water or dilute acids .

Acid radicals: Chloride, Carbonate, Sulphate, Nitrate

Basic radicals: Lead, Cadmium, Copper, Aluminium, Zinc, Calcium, Magnesium, Ammonium.

Identification of acid and basic radicals in

1. Lime Stone (Calcium Carbonate)
2. Pollutant (Lead nitrate or Cadmium Carbonate)
3. Fertilizer (Ammonium sulphate)
4. Electrolyte (Ammonium Chloride)

5. Fungicide (Copper sulphate)
6. Coagulant (Aluminium Sulphate)
7. Mordant (Zinc Sulphate)
8. Gypsum (Calcium Sulphate)
9. Epsom (Magnesium Sulphate)

Students may be asked to analyse the above salts and write the analysis in record book with the title such as analysis of limestone, analysis of pollutant etc.

10. Analysis of an Effluent (containing pollutants like Lead, Cadmium, Zinc, Copper). Students may be given above four pollutants, in four separate test tubes in solution form and asked to report metallic pollutants with procedure (Basic Radical Analysis Procedure) and their harmful effects.

In the examination two effluents in two separate test tubes containing any two metallic pollutants of the above four may be given. Any two students may be given this question per batch.

1. VOLUMETRIC ANALYSIS (DOUBLE TITRATIONS):

ACIDIMETRY AND ALKALIMETRY

1. Estimation of Hydrochloric acid
2. Estimation of Sodium Hydroxide
3. Estimation of Sodium Carbonate
4. Comparison of Strengths of two bases

PERMANGANIMETRY

5. Estimation of Ferrous Ammonium Sulphate
6. Estimation of Ferrous Sulphate
7. Comparison of Potassium Permanganate.

WATER ANALYSIS

8. Estimation of Total Hardness by EDTA method.

9. Calculation of pH of four sample solutions and calculation of H⁺ Ion concentration for a particular sample solution.

This question may be given for any two students per batch.

Reference:

(1) Vogel - Analytical Chemistry – Pearson publication.

(2) Dr. Sudha Rani - Laboratory Manual on Engineering Chemistry, Dhanpat rai publication.

109DTP03/209DTP03 - Computer Application Laboratory (I & II Semesters)

OBJECTIVES:

At the end of the programme, the student will be able to

- (1) Acquire the basic computer skills for various applications to students of all branches of study.
- (2) Explain the various operating systems
- (3) State the usage of word package
- (4) Explain the facilities in a spread sheet.
- (5) Prepare the slides using power point.
- (6) Acquire Auto CAD, Practical skill in using
- (7) Explain how to use of internet facility

Introduction:

- 1) Introduction to Computer Organization & fundamentals
- 2) Introduction to Computer parts & Peripherals.
- 3) Introduction to Open source softwares

PART – A

WINDOWS

1. a. Starting a program, running a program.
 - b. Starting the Windows in safe mode.
 - c. Running multiple Programs and switching between windows.
 - d. Moving the windows, and the task bar.
 - e. Startup to MS-DOS prompt.
2. a. Creating and removing a folder.
 - b. Making the taskbar wider, arranging icons on the Desktop.
 - c. Displaying and hiding the taskbar clock.
 - d. Controlling the size of start menu options.
 - e. Creating shortcuts.

3. a. Installing a screen saver.
 - b. Assigning Wallpaper to Desktop.
 - c. Adding a program to the start menu.
 - d. Recovering files and folders from Recycle bin.
 - e. Customizing the mouse settings.

4. a. Expanding and collapsing a folder.
 - b. Recognizing file types using icons.
 - c. Running a program from explorer.
 - d. Renaming a file or folder.
 - e. Selecting two or more files for an operation.

5. a. Displaying the properties for a file or folder.
 - b. Using cut and paste operations to copy a file.
 - c. Using copy and paste operations to copy a file.
 - d. Moving and copying files with mouse.
 - e. Sorting a folder.

6. a. Finding a file or folder, by name.
 - b. Defragmenting the disk using disk defragmenter.
 - c. Compressing a file using WinZip.
 - d. Controlling the speaker volume.
 - e. Recording and saving an audio file.

MS – WORD

1. Prepare a newsletter with borders, two columns text, header and footer and a graphic image and spell check the document.
2. Create a table to show the paradigm of the verb "eat" in all 12 tenses

Tense		Present	Past	Future
Simple	He	Eats	Ate	Will eat
	I	Eat	Ate	Will eat
	You/They	Eat	Ate	Will eat
continuous	He	Is eating	Was eating	Will be eating
	I	Am eating	Was eating	Will be eating
	You/They	Are eating	Were eating	Will be eating
Perfect	He	Has eaten	Had eaten	Will have eaten
	I	Have eaten	Had eaten	Will have eaten
	You/They	Have eaten	Had eaten	Will have eaten
Perfect continuous	He	Has been eating	Had been eating	Will have been eating
	I	Have been eating	Had been eating	Will have been eating
	You/They	Have been eating	Had been eating	Will have been eating

3. Prepare your Bio-data/Resume
4. Do the mail merge operation for sending applications to many companies with your resume.

MS – EXCEL

1. Create a worksheet in Excel for a company:
 - a. Copy, Move and Merge the cells
 - b. Adding Comments
 - c. Adding, Deleting the cells, Rows and Columns
 - d. Hiding and Unhiding the columns, Rows and gridlines.
2. Using formula and functions prepare worksheet for storing subject marks of ten students and perform the following:
 - a. Calculate the student wise total and average
 - b. Calculate the subject wise total and average
 - c. Calculate the overall percentage and also individual percentage of the student.
3. Create a Circle diagram (Pie chart) for the following data:

Breakup of the runs scored by Sachin Tendulkar

6's – 7 - 42

4's – 38 - 152

3's - 5	-	15
2's - 15	-	30
1's - 21	-	21
Total		260

4. Create a Bar diagram for the following data :

The population of different metropolitan cities

Chennai:	Men - 71,55,294	Women - 75,24,115
Mumbai:	Men - 98,00,987	Women - 82,33,678
Calcutta:	Men - 81,24,865	Women - 77,28,346
Delhi:	Men - 1,43,25,086	Women - 99,87,242

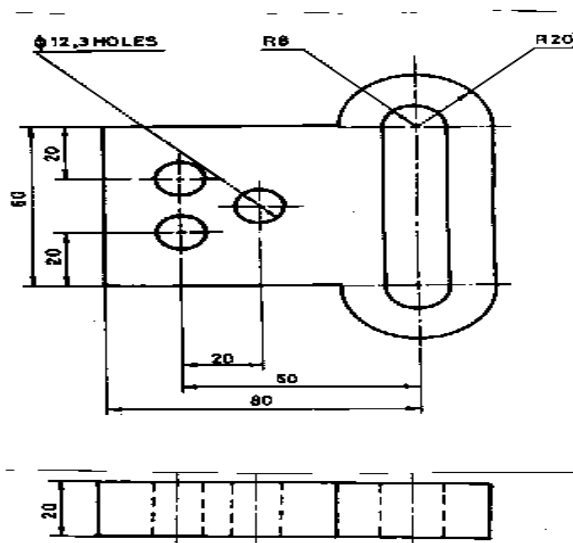
PART - B

MS - POWERPOINT

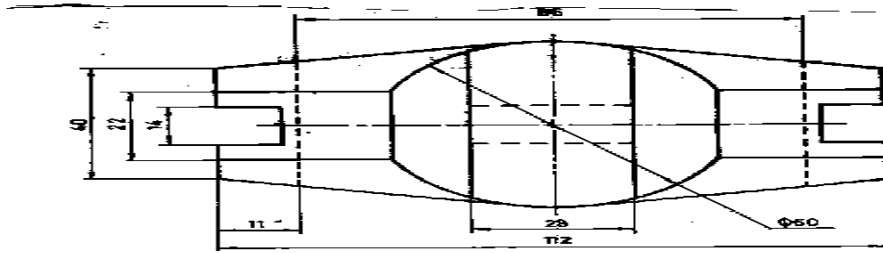
1. Create a simple presentation with atleast 5 slides to introduce your friend and include sounds in slides.
2. Create a presentation with 5 slides for the essay Astrologer's Day by R.K Narayanan

AUTOCAD

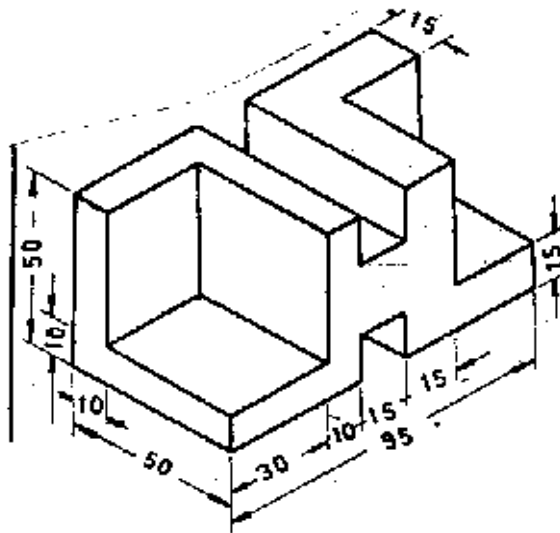
1. Draw the given 2D drawing and dimension it by using Auto Cad.



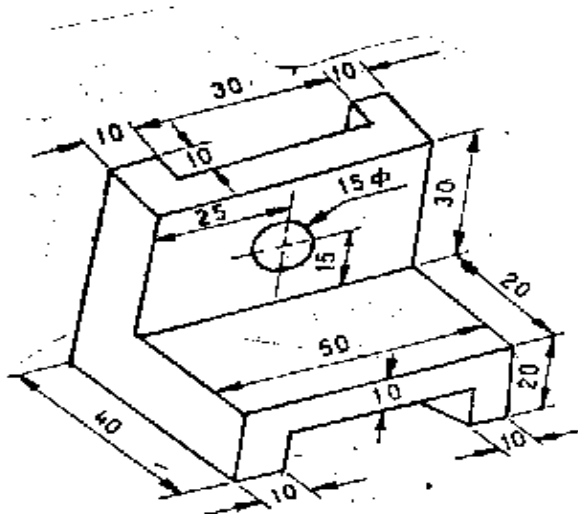
2. Draw the given 2D drawing and dimension it by using Auto Cad



3. Draw the given Isometric drawing and dimension it by using Auto Cad



4. Draw the given Isometric drawing and dimension it by using Auto Cad



INTERNET

1. a. Creating an E-Mail account.
b. Sending an E-Mail to a known Address
c. Viewing an E-Mail received from your friend/relative.
2. a. Printing an E-Mail received
b. Use of Attachment Facility
c. Use of Address Book Facility
3. a. Use of Sent Folder
b. Use of Save Draft Folder
c. Use of Trash Folder
4. a. Browse a given web-site address.
b. Search a Particular topic through a Search engine.

109DTP04/209DTP04 - WORKSHOP PRACTICE (I & II Semesters)

OBJECTIVES:

At the end of the programme, the student will be able to

- (1) Demonstrate skills in basic of engineering practice
- (2) Identify the hand tools and measuring instruments
- (3) Demonstrate measuring skills
- (4) Demonstrate fitting practice skills
- (5) Demonstrate wiring practice skills
- (6) Demonstrate plumbing practice skills
- (7) Demonstrate carpentry practice skills
- (8) Demonstrate sheet metal practice skills

FITTING PRACTICE:

- General safety precaution inside the Workshop.
- Study about First Aid.
- Study of Hand Tools and measuring Instruments
- Marking and Punching Practice
- Hacksaw cutting Practice
- Filing & Fitting Practice
- Drilling & Tapping Practice

Note: Practices should be given to cover the above area. At the end, the students should be able to do the following exercises for the Board Practical Examinations.

Exercises

1. V - Joint
2. L - Joint
3. T - Joint
4. Half round joint
5. Dovetail Joint
6. U - Joint
7. Hexagonal - Joint
8. Step - Joint
9. Drilling and Tapping M8
10. Drilling and Tapping M10

Note: 70mm X 50mm X 3 mm thick plate can be used for the above joints. All the exercises should be given for the Board Practical Examinations.

WIRING & PLUMBING PRACTICE

- Study about the Safety in wiring.
- Study of Hand & Power Tools and Testing tools.
- Study the purpose of earthing.
- Types of Switches & Sockets.
- Standard type of wires & Colour codes.
- Identify the symbols used in the circuit diagram.
- Practice the simple wiring methods.
- Soldering Practice.
- Study of plumbing materials and tools.
- Study of pipe fittings (specials) PVC and GI.

Exercises

1. Single lamp controlled by single switch.
2. Two Lamps controlled by Two independent switches.
3. Stair case Wiring
4. Fluorescent lamp circuit.
5. Circuit diagram of a fan
6. Circuit diagram of an iron box
7. Circuit diagram of a mixie
8. Soldering practice
9. Pipe cutting and threading(GI).
10. Prepare and make a layout for single tap connection.
11. Preparing and make a layout for tap connection in a wash basin.
12. Servicing of the taps (Metal and PVC).

Note: Experimental boards should be prepared to trace the circuit diagram. All the exercises should be given for the Board Practical Examination.

CARPENTRY PRACTICE:

Study of Hand Tools & Marking Gauges.

- Marking & Planing Practice.
- Sawing & Chiseling Practice

Note: Practices must be given to cover the above area. At the end, the students should be able to do the following exercises for the Board Practical Examinations.

Exercises

1. Half Lap Joint
2. T Halving
3. T – Bridle
4. T – Mortise
5. Corner Bridle

Note: 250mm X 50mm X 25 mm thick wood can be used for the above joints. All the exercises should be given for the Board Practical Examinations.