CERTIFICATE

OF

VOCATIONAL EDUCATION

EXAMINATION (YEAR12)

SYLLABUS FOR

PRINTING TECHNOLOGY TECHNICIAN

Correspondence should be addressed to:

THE CHIEF EXECUTIVE & SECRETARY

COUNCIL FOR THE INDIAN SCHOOL CERTIFICATE EXAMINATIONS

P-35,36 Sector VI
Pushp Vihar
Saket
New Delhi – 110017

The certificate course in **PRINTING TECHNOLOGY TECHNICIAN (PTT)** is equivalent to Class XII, having the added advantage of providing the students with a basic knowledge of Printing Technology.

A successful candidate has two options available to him/her:

1. To become a small entrepreneur and execute Printing Technology Contracts.
2. Find suitable employment in the Printing & Designing Industry.

A successful candidate, if interested, has a third option of taking up higher studies in Printing Technology by joining the Institution of Engineers (India) as a student member.

Eligibility Criteria:

The eligibility criteria for taking admission in CVE 12 Examination are as follows:

1. Age: 16 to 25 years
2. Must have passed Class X Examination from a recognised board with English, Science and Mathematics as compulsory subjects

CONTENTS

S. No.	Topic	Page No.
1	Subject Structure and Marking Scheme for Classes XI & XII	4
CLASS XI		
2	English	6
3	General Foundation, Industrial Sociology & Entrepreneurship	7
4	Applied Mathematics	9
5	Printing Technology – Paper I(Theory)	13
6	Fundamentals of Computer	14
7	Printing Technology – Paper II (Practical)	18
CLASS XII		
8	English	22
9	General Foundation, Industrial Sociology & Entrepreneurship	23
10	Printing Technology – Paper I(Theory)	26
11	Printing Technology – Paper II(Practical)	27

CLASS XI – SUBJECT STRUCTURE & MARKING SCHEME

S. No.	NAME OF THE SUBJECT	Theory/Practical	Internal Assessment	External Assessment	Total Marks	Pass Criteria (%)
1	English	Theory	30	70	100	40
2	General Foundation, Industrial Sociology & Entrepreneurship	Theory	30	70	100	40
3	Applied Mathematics	Theory	30	70	100	40
4	Printing Technology – Paper I	Theory	30	70	100	40
5	Fundamentals of Computer	Practical	30	30 + 40	100	40
6	Printing Technology – Paper II	Practical	30	70	100	60

Note:

FUNDAMENTALS OF COMPUTER -There will a project of 30 marks and practical examination of 40 marks to be conducted by the Council.

CLASS XII – SUBJECT STRUCTURE & MARKING SCHEME

S.No.	NAME OF THE SUBJECT	Theory/Practical	Internal Assessment	External Assessment	Total Marks	Pass Criteria (%)
1	English	Theory	30	70	100	40
2	General Foundation, Sociology & Entrepreneurship	Theory	30	70	100	40
3	Printing Technology – Paper I	Theory	30	70	100	40
4	Printing Technology – Paper II	Practical	30	70	100	60

PRINTING TECHNOLOGY

TECHNICIAN

SYLLABUS FOR CLASS XI

English
Class XI

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
	GRAMMAR	
1	Sentences	6
2	Subject & Predicate	6
3	Parts of Speech	20
4	Phrases & Clauses	9
5	Simple, Compound & Complex Sentences	10
6	Tenses	12
7	Formal Letter Writing	12
	LITERATURE	
1	The Eyes Have It	6
2	Job Hunting	6
3	Benjamin Franklin	6
4	The Martyr's Corner	6
5	Life History of Abdul Kalam	6
TOTAL NUMBER OF HOURS		105

General Foundation, Industrial Sociology and Entrepreneurship
Class XI

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	**Personality Development**	13
2	**Human and Industrial Relationship**	15
3	**Developing Coping Mechanism**	15
4	**Motivation**	10
5	**Professional Ethics**	12
6	**Developing Fitness for a Job**	15
TOTAL NUMBER OF HOURS		80

1. **Personality Development:**
   - **1.1** Self-esteem
   - **1.2** Self-concept
   - **1.3** Self-acceptance

2. **Human and Industrial Relations:**
   - **2.1** Human relations and performance in organisation
   - **2.2** Understand self and others for effective behaviour
   - **2.3** Behaviour modification techniques
   - **2.4** Industrial relations and disputes
   - **2.5** Relations with subordinates, peers & superiors
   - **2.6** Characteristics of group behaviour and trade unions

3. **Developing Coping Mechanism:**
   - **3.1** Coping with loneliness
   - **3.2** Coping with depression
   - **3.3** Coping with fear
   - **3.4** Coping with shyness
   - **3.5** Coping with anger
   - **3.6** Coping with failure
   - **3.7** Coping with criticism
   - **3.8** Coping with conflicts

- **3.9** Coping with change
- **3.10** Coping with study
- **3.11** Substance abuse
- **3.12** Mass media

4. **Motivation:**
   - **4.1** Factors determining motivation
   - **4.2** Characteristics of motivation
   - **4.3** Methods of improving motivation

5. **Professional Ethics:**
   - **5.1** Concept of ethics
   - **5.2** Concept of professionalism
   - **5.3** Need for professional ethics

6. **Developing fitness for a job:**
   - **6.1** Leadership
   - **6.2** Team work
   - **6.3** Career guidance
   - **6.4** Work environment

Applied Mathematics
Class XI

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	Units	4
2	General Simplification	6
3	Ratio & Proportion	4
4	Percentage	5
5	Algebra	12
6	Logarithm	6
7	Indices	8
8	Equations	14
9	Factorization	10
10	Properties of Triangle, Circle & Polygons	6
11	Mensuration	20
12	Trigonometry (Ratio & Identities)	10
TOTAL NUMBER OF HOURS		105

1. **Units:**
   - **1.1** Introduction
   - **1.2** Definitions
   - **1.3** Classification of units
   - **1.4** Conversion of the basic mechanical units

2. **General Simplification:**
   - **2.1** Introduction
   - **2.2** Fractions & Decimal Fractions
   - **2.3** LCM & HCF
   - **2.4** Multiplication and division of decimals
   - **2.5** Conversion of fraction from one to another

- **2.6** Multiplication of fraction with numbers like 10, 100, 1000
- **2.7** Some more methods of converting fractions

3. **Ratio & Proportion:**
   - **3.1** Ratio
   - **3.2** Proportion
   - **3.3** Relationship between Ratio & Proportion

4. **Percentage:**
   - **4.1** Introduction
   - **4.2** Conversion of decimal to percentage and vice versa
   - **4.3** Profit & Loss

5. **Algebra:**
   - **5.1** Introduction
   - **5.2** Careful Consideration of subject items
   - **5.3** Addition and Subtraction
   - **5.4** Multiplication and Division
   - **5.5** Algebraic formulae
   - **5.6** Proofs

6. **Logarithm:**
   - **6.1** Introduction
   - **6.2** Definition of different terms used in logarithms
   - **6.3** Laws of Logarithm
   - **6.4** How to refer to a log table
   - **6.5** Negative characteristic
   - **6.6** Relationship between log and antilog
   - **6.7** How to refer to Antilog table
   - **6.8** Rules while using logarithms
   - **6.9** Addition, subtraction, multiplication & division using indices

7. **Indices:**
   - **7.1** Exponent and multiplication
   - **7.2** The laws of indices
   - **7.3** Zero and negative integral indices
   - **7.4** Fractional Indices
   - **7.5** Exponential Equations

8. Equations:

- **8.1** Equations & Root
- **8.2** Solving linear equation with one variable
- **8.3** Solving problems using equations
- **8.4** Number Problems, Age Problems, Mensuration Problems
- **8.5** Solving simultaneous linear equation
- **8.6** Method of elimination by addition and subtraction
- **8.7** Word problem involving simultaneous equation
- **8.8** Quadratic Equations – Problems on Quadratic Equation

9. Factorization:

- **9.1** Factorizing polynomials
- **9.2** Factorization of a perfect square trinomial – e.g. $(4x^4 + 12x^2 + 9)$
- **9.3** Factorizing the difference of two squares
- **9.4** Trinomials
- **9.5** Factorization using the middle term factor
- **9.6** Problem solving based on factorization

10. Properties of Angle, Triangle, Circle and Polygons:

- **10.1** Introduction
- **10.2** Different properties related to the angular properties of the triangle
- **10.3** Different types of triangles
- **10.4** Median and Altitudes
- **10.5** Mid-Point theorem of the triangle
- **10.6** Circle - Elements
- **10.7** Properties of the circle – Arc, Sector, Segment, Chord, Tangent
- **10.8** Polygons – Types and Features
- **10.9** Method of finding the internal and external angle of polygons

11. Mensuration:

- **11.1** Introduction to the topic
- **11.2** Formulae for various Plane and irregular figures (Area, perimeter and volume)
- **11.3** Area and Perimeter of Plane Figures like Rectangle, Square, Area of four walls, Triangle, Parallelograms, Rhombus, Trapezium, Circle
- **11.4** Surface area of different solid figures
- **11.5** Volume of different Solid figures
- **11.6** Volume of the metal that is removed from different machining process

12. Trigonometry:

- **12.1** Introduction to Trigonometry
- **12.2** Notation for angle
- **12.3** Trigonometrical Ratio
- **12.4** Reciprocal ratios
- **12.5** Understanding of the different sides of the triangle based on the given angle
- **12.6** Understanding the use of Trigonometrical tables for finding different angles

Printing Technology – Paper I
Class XI

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	History of Printing	2
2	Introduction to Basic Printing Processes	4
3	Printing Machine in General	2
4	Printing Materials	3
5	Computer Application in Printing	3
6	Binding and Finishing	4
7	Printing Machine (Offset, Gravure) (Sheet fed & Web)	10
8	Printing Inks Quality, Types, Ink mixing	5
9	Paper Technology	5
10	Screen Printing	5
11	Printing Planning Layouts	5
12	Film Assembly & Plate Making	4
13	Packaging Technology	2
TOTAL NUMBER OF CLASSES		54

Fundamentals of Computer
Class XI

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	**Introduction to Computer**	5
2	**Number System**	8
3	**Operating System**	4
4	**Introduction to MS Office**	2
5	**Microsoft Word**	10
6	**Microsoft Excel**	16
7	**Microsoft Power Point**	4
8	**Internet & Security**	8
9	**Project Work**	8
TOTAL NUMBER OF HOURS		65

1. Introduction to Computer:

- **1.1** Introduction & application of computers
- **1.2** History of the Computer – Evolution and generation of computers
- **1.3** Hardware & Software
- **1.4** Different Hardware devices with physical demonstration
- **1.5** Different types of software used with their areas of application
- **1.6** Storage devices – Evolution and its application in modern technology
- **1.7** Characteristics of the computer
- **1.8** Organization of the computer
- **1.9** Basic operation carried out by the computer
- **1.10** Understanding the day to day application of the computer

2. Number System:

- **2.1** Introduction to the number system

2.2 Types of number systems used – Decimal, Binary, Octal and Hexadecimal
2.3 Conversion from Decimal to Binary and vice-versa
2.4 Conversion of Decimal to Octal and Vice-Versa
2.5 Conversion of Decimal to Hexadecimal and Vice-Versa
2.6 Conversion of Fractional Decimal to Binary, Octal and Hexadecimal
2.7 Logic Gate – Not, Or, And

3. Operating System:

3.1 Introduction about Operating System and its uses
3.2 Types of Operating System used
3.3 Application of Operating System in our computer
3.4 Method of Installing the Operating System
3.5 Method of partitioning the Hard Disk during the installation of the Operating System
3.6 Advantages & Comparisons of different types of Operating Systems

4. Introduction to MS Office:

4.1 Introduction to Microsoft Office Package
4.2 Different applications available in the package
4.3 Advantages and application of different applications available
4.4 An overview on the available applications – MS Word, Excel, PowerPoint, Access, Outlook
4.5 Process of Opening the Microsoft Office Package from the START BUTTON

5. Microsoft Word:

5.1 Introduction
5.2 Procedure of opening the Microsoft word Application
5.3 Introduction to the Microsoft Word Screen/Page
5.4 Understanding different options available
5.5 Understanding different context menus available on the page with their application
5.6 Understanding the **OFFICE BUTTON** – New, Open, Save, Save As, Print, Prepare, Publish, Close, Word Options, Recent Documents
5.7 Understanding the **HOME** Menu – Clipboard Option, Font Options, Paragraph, Styles
5.8 Understanding the **INSERT** Menu – Pages, Tables, different methods of inserting pictures, Links, Header & Footer, Text Formatting, Symbols
5.9 Understanding the **PAGE LAYOUT** Menu – Different themes, Page Setup, Page Background, Paragraph Indentation, Alignment,
5.10 Understanding the complete process of Mail Merge (Letter)
5.11 Understanding the Concept of viewing the pages in different styles, New windows, Split page option
5.12 Practical work on the above content

6. Microsoft Excel:

- **6.1** Introduction
- **6.2** Procedure of opening the Microsoft Excel Application
- **6.3** Introduction to the Microsoft Excel Screen/Page
- **6.4** Understanding different options available
- **6.5** Understanding the method of renaming, adding and removing the sheet
- **6.6** Understanding the method of copying and moving the sheet
- **6.7** Understanding different short cuts used on the application
- **6.8** Understanding the **HOME** menu – Clipboard Options, Font Options, Paragraphs, Styles
- **6.9** Understanding the **INSERT** Menu – Table Creation, different methods of inserting pictures & shapes, charts, links and methods of formatting the text
- **6.10** Understanding the **PAGE LAYOUT** Menu – Themes, Page setup, Scale, Sheet Options, Alignment
- **6.11** Understanding the **FORMULAS** Menu – Insert function, Function Library (Auto Sum, Logical, Text, Lookup, Date & time)
- **6.12** Conditional Formatting
- **6.13** Basic Menu options like View, Data and Review
- **6.14** Practical work on the above content

7. Microsoft PowerPoint:

- **7.1** Introduction
- **7.2** Procedure of opening the Microsoft Power Point Application
- **7.3** Introduction to the Microsoft Power Point Screen/Page
- **7.4** Understanding different options available
- **7.5** Understanding different shortcuts used for the application
- **7.6** Understanding the **HOME** Menu – Clipboard, Slides, Font, Paragraph indentation, drawing tools, find & replace
- **7.7** Understanding the **INSERT** Menu - Table Creation, Different methods of inserting pictures & shapes, Charts, Link, method of formatting the text & methods of inserting movie clip & audio in the slide
- **7.8** Understanding the **DESIGN** Menu – Page Setup, different themes to be used as the background of the slides, colours, fonts, effects, background style
- **7.9** Understanding the **ANIMATION** Menu – Custom Animation, different transition options for the slides, background music, transition speed, slideshow option (on mouse click or after time interval that is set)
- **7.10** Understanding the **SLIDE SHOW** Menu – Start & End of the slide show, slide show setup, monitoring the resolution and other factors
- **7.11** Understanding various options like Review and View
- **7.12** A presentation to understand the different options available in the application

8. Internet & Security:

- **8.1** Introduction to Internet & Security
- **8.2** Different types of connections that can be established in the system
- **8.3** Uses, advantages and disadvantages of the Internet
- **8.4** Security – Definition & Goals
- **8.5** Basic ISP (Internet Service Providers) Infrastructure
- **8.6** Virus – Definition and its different types
- **8.7** Firewall – Definition and applications
- **8.8** Understanding the basic security measures

9. Project Work

The students will prepare a project work using the concepts taught in the 'Fundamentals of Computer'.

Printing Technology – Paper II
Class XI

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	5 S – Workshop	50
2	Recognition of different Printing Processes	10
3	Identification of different tools & equipment used	15
4	Schematic diagram of various Printing Processes	10
5	Cleaning an Image carrier of Printing Machines	5
6	Clamping & Removing an Image carrier	10
7	Study of various parts of feeding units of the Printing Machine	15
8	Study of various parts of Delivery units of the Printing Machine	10
9	Study of various rollers in the inking units of Printing Machines	10
10	Study of various rollers in dampening units of Offset Machine	10
11	Substrate loading & setting feeder of Printing Machines	15
12	Study of side lay & front lay of Printing Machines	5
13	Study of colour registration of Printing Machines	10
14	Study of single Colour Printing	15
15	Study of cleaning the Printing Machine after completion of work	10
TOTAL NUMBER OF HOURS		200

PRINTING DESIGN

TECHNICIAN

SYLLABUS FOR CLASS XII

English
Class XII

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
	GRAMMAR	
1	Direct & Indirect Speech	18
2	Phrases & Idioms	8
3	Letter Writing (Informal)	11
4	Report Writing, Essay Writing & Precis Writing	15
5	Comprehension & Story Writing	13
	LITERATURE	
1	Wright Brothers	8
2	Jamshedji Tata	8
3	Solar Energy	8
4	Thomas Edison	8
5	Henry Ford	8
TOTAL NUMBER OF HOURS		105

General Foundation, Industrial Sociology and Entrepreneurship
Class XII

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	**The Constitution of India**	**5**
2	**An Ideal Supervisor**	**5**
3	**Industrial Safety, First Aid and Hygiene**	**10**
4	**Entrepreneurship**	**10**
5	**Labour Laws**	**16**
6	**Environmental Science**	**10**
7	**Estimation & Costing**	**12**
8	**Project Plan**	**12**
TOTAL NUMBER OF HOURS		**80**

1. **The Constitution of India:**
   - **1.1.** Salient Features
   - **1.2.** Preamble to the Constitution
   - **1.3.** Fundamental Duties
   - **1.4.** Directive Principles of State Policy
   - **1.5.** Difference between Fundamental Rights and Directive Principles

2. **An Ideal Supervisor:**
   - **2.1** Qualities of an ideal supervisor

3. **Industrial Safety, First Aid and Hygiene:**
   - **3.1.** Concept of Safety
   - **3.2.** Safety Consciousness
   - **3.3.** Necessity of safety
   - **3.4.** Safety Measures

4. Entrepreneurship:

- **4.1.** Introduction
- **4.2.** Definition of Entrepreneurship
- **4.3.** Need for Self-Employment
- **4.4.** Advantages of Entrepreneurship
- **4.5.** Roles and responsibilities of an Entrepreneur
- **4.6.** Qualities of a good Entrepreneur

5. Labour Laws:

- **5.1.** Factories Act 1948
- **5.2.** Apprentices Act
- **5.3.** Employees State Insurance (ESI) Act
- **5.4.** Payment of Wage Act 1936
- **5.5.** Minimum Wages Act & Rules
- **5.6.** Employees Provident Fund Act (EPF)
- **5.7.** Workmen's Compensation Act

6. Environmental Science:

- **6.1** Effect of pollution on Human Health
- **6.2** Impact of technology on Environment
- **6.3** Impact of pollution on Environment
- **6.4** Waste Management

7. Estimation & Costing:

- **7.1** Introduction to Estimation and Costing
- **7.2** Importance and Aims of Estimation & Costing
- **7.3** Functions of Estimating Department
- **7.4** Qualities of an Estimator
- **7.5** Estimating Procedures and Errors in Estimation
- **7.6** Constituents of Estimation
- **7.7** Advantages of Standard Costing
- **7.8** Differences between Estimation and Costing
- **7.9** Procedures of Costing & Costing methods
- **7.10** Cost Control and Advantages of Efficient Costing
- **7.11** Elements of Cost
- **7.12** Components of Cost and the process of calculating material cost & labour cost
- **7.13** Block diagram of Components of Cost
- **7.14** Methods of calculating indirect expenses and depreciation cost
- **7.15** Repairs and Maintenance Costing
- **7.16** Basic numerical on Estimation and Costing

8. Project Plan:

- **8.1** Introduction
- **8.2** Definitions of Working Capital, Fixed Capital, Budget
- **8.3** Market Survey
- **8.4** Project Planning
- **8.5** Project Capacity
- **8.6** Selection of Site and Plant Layout
- **8.7** Product design and development
- **8.8** Factors considered while designing a product
- **8.9** Product drawings and design specification
- **8.10** Product Development
- **8.11** Material Requirement
- **8.12** Operation Planning
- **8.13** Equipment Requirement
- **8.14** Material Handling
- **8.15** Break-Even Point
- **8.16** Preparation of Project

Printing Technology – Paper I
CLASS XII

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	Digital Printing	4
2	Printing Machinery Maintenance	5
3	Advance Offset Printing	16
4	Newspaper Technology	6
5	Press Management	6
6	Printing Costing and Estimating	8
7	New Technology in Printing	5
8	Quality Control	4
TOTAL NUMBER OF HOURS		54

Printing Technology-Paper II
Class XII

Examination Duration: 3 Hours

S. No.	Name of the Topic	No. of Hours
1	5 S – Workshop	40
2	Introduction to Offset Printing Machines & Study of various parts, controls, operations, mechanism & lubrication system	10
3	Study of feeding / delivery, dampening & inking system of sheet fed / Web Fed Offset Machines	5
4	Preparation image career, clamping in machine, registering colours & sheet / web offset printing press	10
5	Pre-make-ready & Make-ready of the sheet / web Offset Machine	5
6	Setting of dampening, inking units & blanket, plate & transfer cylinders of sheet / web offset printing machine	10
7	Study of ink drying mechanism, paper pile preparation, control of water & ink during running sheet /web offset presses	5
8	Study of web control & operations of folding web offset machine	5
9	Trouble shooting during printing of sheet / web offset printing machine	5
10	Study of heat-set, inks & chilling silicon coating system of heat set Offset Presses	10
11	Study of single, double & multi color jobs of sheet / web / heat - set web Offset Printing Machines	10
12	Study of parts, stencil preparation, process of printing & operation of manual, semi-automatic & fully automatic silk screen printing machines	10
13	Study of various tools, inks, coatings & trouble shooting during printing of silk screen printing machine	5

14	**Introduction of various parts, Preparing image career, plate mounting, Registering & Make ready of flexography machine**	**5**
15	**Study of various parts of feeding & Delivery units of printing machine**	**5**
16	**Study of inking units, Printing – single color, two color four color & Modern technology of flexography machine**	**10**
17	**Study of plate/ cylinder preparation & Colour registration of gravure printing machines**	**5**
18	**Study of various parts of gravure printing study single and multicolor printing gravure press**	**5**
19	**Pre-make-ready & Make-ready the gravure printing machine**	**5**
20	**Study of feeding unit, delivery & inking units of sheet / web gravure machine**	**5**
TOTAL NUMBER OF HOURS		**170**