

**INDIRA TECHNICAL EDUCATION SOCIETY,
NASHIK**

**DIPLOMA MECHANICAL ENGINEERING SERVICES
(DMES)**

THEORY PAPER I :	Syllabus for this paper is same as Certificate Course in FITTER [F] Refer this syllabus booklet Page No. _____	100 Marks
THEORY PAPER II :	Theory syllabus for this Diploma Paper II is Separate given below.	100 Marks
THEORY PAPER III :	Syllabus for this paper is same as Certificate Course MECHANICAL DRAUGHTSMAN PAPER - II Refer this syllabus booklet Page No. _____	100 Marks
THEORY PAPER IV :	Theory syllabus for this Diploma Paper IV is Printed below.	100 Marks
PRACTICAL I :	Practical syllabus is same as FITTER Sessional Drawing marks (Internal) Sessional Job work (Internal)	100 Marks 50 Marks 50 Marks
		Total (600 Marks)



(DMES - PAPER – II)

[DMES - II / ADMES - II]

THEORY SYLLABUS

WORKSHOP TECHNOLOGY – II

1. **MACHINES :**
 - A. **LATHES**
 1. Different types of lathe machine a. Turret, b. Capstan, c. Automatic d. Semi – automatic.
 2. Identification & functions of lathe machines.
 3. Speed and feed change arrangements
 4. Different operations performed on lathe machine.
 - B. **MILLING MACHINE**
 1. Different types of milling machines.
 2. Elements of milling machines.
 3. Milling cutter (a) Related terms (b) Classifications.
 4. Indexing, indexing method and its calculations
 5. Different operations performed on milling machine.
 - C. **SHAPING MACHINE**
 1. Identification and function, main features
 2. Explanation quick return motion and stroke setting
 3. Clapper box and tool
 4. Machining methods for horizontal, vertical and inline surfaces.
 5. Method of setting up work.

D. GRINDING MACHINE :

1. Standard types of grinding machines and their use.
2. The abrasive wheel
3. Simple consideration of cutting action.
4. Choice of wheel.
5. Wheel balancing and dressing

E. DRILLING MACHINE

1. Different types of drilling machines
2. Types of drills and its materials
3. Drilling operations
4. Tool and work holding devices

F. C.N.C. MACHINES

1. Operations of C.N.C. machines
2. Fundamental components and its function
3. Types of N. C.
4. (a) Point to point control (b) Continuous path control
5. Types of N.C. system and its function
a) Open loop b) Closed loop
6. Brief knowledge of binary arithmetic
7. Advantage of C.N.C.

2. WORKSHOP LAY OUT :

1. Types of building in which plant is installed.
2. Method of mounting and aligning machine on beds.
3. Test to be required after erection of machine in shop.
4. Products layout and process lay out.

3. SURFACE FINISHING PROCESS & COATING :

1. Necessity of surface finish.
2. Advantage of surface finish.
3. Methods of surface finishing such as grinding, lapping, honing, buffing Super finishing etc.
4. Advantages of coating.
5. Method of surface preparation, Metal spraying.
6. Method of coating such as galvanizing, electroplating, Zinc plating, Powder coating, anodizing, hot dipping.
7. Advantages of painting.
8. Method of painting.

4. MACHINING PROCESS :

Subtraction, Addition, Non-subtraction, Non-Addition, machining such as shaping, slotting, milling, drilling etc.

Addition process : Such as welding, brazing, soldering, plating etc.

Non-subtraction, Non-addition processes : Bending, Twisting, Forging, Shearing, pressing etc.

5. HEAT TREATMENT :

- 1) Necessity & purpose of heat treatment
- 2) Advantage of heat treatment
- 3) Method of heat treatment : Annealing, Normalising, Hardening, Tempering case hardening.

6. MATERIAL HANDLING, CONVEYING & STORING SYSTEM

General terms loading, unloading shifting, various equipment's used for shifting loads. Eq. Crow bar, Lever, Magnetic blocks, Rope, Pulley, Hoist, Jacks, Cranes, Fork lift, Conveyers belts, winch etc.

Various storing systems used for solids liquids & gaseous materials classification & storing materials safety precautions.

7. MAINTENANCE ACTIVITIES

Maintenance definition, Different types of maintenance preventive maintenance, Aim & Basic activity, Break down maintenance.

Planning of maintenance schedule Maintenance of machinery's & material handling equipment's.

GUIDELINE FOR PAPER SETTER

Q. NO. 1	All Topics Objective	20 Marks
Q. No. 2 & 3	Machines	32 Marks
Q. No. 4	Machining process	16 Marks
Q. No. 5	Workshop layout & Maintenance activity	16 Marks
Q. No. 6, 7, 8	Surface finishing process & Coating	48 Marks
	Heat treatment Material Handling and conveying & storing system	



(DMES - PAPER – IV)

[DMES - IV / ADMES - IV]

THEORY SYLLABUS

SECTION – I (60 Marks)
WORKSHOP MANAGEMENT

1. Principle of supervision
2. Quality Control / Inspection
3. Bill of Material / Estimation
4. Job Planning
5. Basic knowledge of factory act, standard orders, ESI and provident fund act, Factory act etc.
6. Knowledge of Industrial safety accident prevention and investigation of accident
7. Concept of quality circle.
8. ISO – 9000
9. Customer service
10. Basic knowledge of tool CRIB and STORES
11. Purchasing
12. Time keeping
13. Minimum wages Act / payment of wages Act.
14. Selection of persons for jobs.
15. Decision Making
16. Job Allocation
17. Selection of workman
18. Knowledge of Apprentices Act 1961.
19. Knowledge of First Aid and First Aid box
20. Execution of power
21. Incentive Scheme

22. Time study, Method study and work study – work simplification.
23. Costing of job
24. Knowledge of labour Control.
25. Communication skill

SECTION – II WORKSHOP CALCULATION

(40 Marks)

1. **UNITS & MEASUREMENT :**
Definition of unit. Types of units. Systems of units. Conversion of units of simple Quantities from one system to other.
2. **SIMPLE ARITHMETIC :**
Definitions, Simplification, Equation, Simplification of equation. Simplification of simultaneous equation.
3. **MENSURATION :**
Definition, Plain figures, Areas of simple figures, Area of polygon. Calculation of volume of solids such as Cylinder, Ring, Pyramid, Prism, Frustum of a cone.
4. **WORK POWER ENERGY :**
Definition of work, power & energy, Types of energies. Horse power, Definition, Types, Transmission of power by Belt – pulley drive, Mechanical advantage, Velocity ratio & Efficiency.
5. **CUTTING SPEED & FEED :**
Definition, Factors affecting cutting speed, Cutting speed calculation for lathe, shaper & drill machine, simple calculation.
6. **TAPER TURNING :**
Taper turning method. Taper calculation for
 - 1) Tail stock offsetting method.
 - 2) Uniform compound rest method.
 - 3) Taper attachment method.
7. **BILL OF MATERIAL :**
Bill of material for simple mechanical assembly, consisting of seven to eight items.

GUIDE LINE FOR PAPER SETTER :

Section I	(Solve any four)	60 Marks
	To set six questions. On all workshop management each of	15 marks.
Section II	(Q. No. 7 compulsory and solve two out of	40 Marks
	Q. No. 8, 9, 10 each of 10 marks)	
Q. No. 7	Units & measurements	20 Marks
	Compulsory	
	Simple Arithmetic Menstruation	
Q. No. 8	Work power energy	10 Marks
Q. No. 9	Cutting speed & feed	10 Marks
Q. No. 10	Bill of material	10 Marks

