NEW ERA SENIOR SECONDARY SCHOOL, VADODARA

Lesson Planning– CLASS: XII for Year 2025-26

SUBJECT: ENGINEERING GRAPHICS (046)

Topics	Month
THEORY **Unit I: Isometric Projection of Solids**	
(i) Construction of isometric scale showing main divisions of 10mm and smaller divisions of 1 mm, also showing the leading angles. Drawing helping view/s such as triangles, pentagon, hexagon, etc., using isometric scale.	**April '25**
(ii) Isometric projection (drawn to isometric scale) of right regular solids such as cubes; prisms and pyramids (triangular, square, pentagonal and hexagonal); cone; cylinder; sphere; hemi-sphere; when they are kept with their axis (a) perpendicular to HP/VP (b) parallel to HP and VP both.	**April '25**
(iii) Combination of any two above mentioned solids keeping the base side parallel or perpendicular to HP/VP and placed centrally together (Axis of both the solids should not be given parallel to HP). **Note:** 1. Hidden lines are not required in isometric projection. 2. Indicate the direction of viewing.	**June '25**
Unit II: Machine Drawing (as per SP46: 2003) **A. Drawing of machine parts** (i) Drawing to full size scale with instruments. (Internal choice will be given between any two of the following). Introduction of threads: Standard profiles of screw threads - Square, Knuckle, B.S.W., Metric (external and internal); Bolts – Square head, hexagonal head; Nuts – Square head, Hexagonal head; Plain washer, Combination of nut and bolt with or without washer for assembling two parts together;	**July '25**
(ii) Free-hand sketches Conventional representation of external and internal threads; Types of studs – Plain stud, Square-neck stud, Collar stud; Screws (round-head, cheese- head, 90^0 flat counter sunk-head, hexagonal socket head and grub-screw); Types of rivets – Snap head, Pan head (without tapered neck), Flat head, 60^0 countersunk flat head.	**July '25**
B. Assembly drawings and Dis-Assembly drawings (Internal choice will be given between an Assembly drawing and a Dis-Assembly drawing). 1. Bearings (i) Open-Bearing (ii) Bush- Bearing	**July'25**
2. Rod-Joints (i) Cotter-joints for round-rods (Sleeve and cotter joint) (ii) Cotter-joints for square rods (Gib and cotter-joint)	**Aug'25**

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3. Tie-rod and Pipe-joint
   (i) Turnbuckle — **Aug'25**
   (ii) Flange pipe joint

Note:

1. *In all Assembly drawings, half sectional front view will be asked. Side/End view or Top View/Plan will be drawn without section.*
2. *In all Dis-assembly drawings, only two orthographic views (one of the two views may be half in section or full in section) will be asked of any two parts only.* — **Sep'25**
3. *(a) In all sectional views, hidden lines/ edges are not to be shown.*

   (b) In all full views, hidden lines/edges are to be shown.

PRACTICALS

(i) To perform the following tasks (for One only) from the given views of the prescribed fifteen (15) machine blocks in **ANNEXURE-I**.

Value-Points

1.	Copy the given views	1
2.	Drawing the missing view with hidden lines	2
3.	Sketching the Isometric view without hidden edges	5
4.	To make the machine block of the above in three dimensions. (Not to scale but approximately proportionately drawn with Any medium i.e., Soap-cake, plasticine, clay, wax, floral foam brick (available with florists), etc.	7

Nov'25

(ii) Computer Aided Design (CAD) – Project 10

Project file to be submitted on the simple solids or machine blocks as prescribed in part-I by using the CollabCAD software or any equivalent pertinent software. — **Nov'25**

(iii)	(a) Sessional work relating to machine blocks as prescribed.	3
	(b) Viva-voce based on part-I and part-II	2
	Total Marks	**30**

Dec'25

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COURSE STRUCTURE
CLASS XII

One Paper (Theory): 3 Hours — 70 Marks
One paper (Practical): 3 Hours — 30 Marks

S. No.	Unit Name	Marks
I	Isometric Projections of Solids	25
II	**Machine Drawing** A. Drawing of Machine parts B. Assembly Drawing and Dis-assembly drawings 1. Bearings 2. Rod joints 3. Tie-rod and Pipe joint	45
	Practical	30
	Total Marks	**100**