

HEMCHANDRACHARYA, NORTH GUJARAT UNIVERSITY, PATAN

B.E. FIRST YEAR (EC, IT, CE, MC, BM)

IT 102: ELEMENTS OF CIVIL ENGINEERING & MECHANICAL ENGINEERING

(In force from June 2006)

| Teaching Scheme | | Examination Scheme | | | | |
|-----------------|----------------|--------------------|--------------|-------------------|----------------|-------------|
| Theory Hrs. | Practical Hrs. | Theory Hrs. | Theory Marks | Pract./Viva Marks | Termwork Marks | Total Marks |
| 2 | 4 | 3 | 100 | - | 100 | 200 |

* CIVIL ENGINEERING:

1. Elements of Surveying: Surveying and leveling, definition, geodetic survey and plane survey, scale plans and maps, chain survey, Traversé survey, compass traverse survey. Leveling: General terms used in leveling. Method of leveling contour survey, Area measurement by planimeter.
2. Elements of Water Resources Development: Elementary hydrology water requirement and its conservation.
3. Elements of Environmental Protection: Environment and Ecosystem, Water quality criteria, Domestic and Industrial wastes and treatment, Air and energy related pollution.

* MECHANICAL ENGINEERING:

1. Engineering Drives: Fundamentals of belt, rope and chain drives, gears and gear trains, reciprocating and intermittent drives, bearing, clutches and brakes.
2. Internal Combustion Engines: Classification, Working of petrol and diesel engines, Performance and characteristics.
3. Steam Generators: Fire tube, water tube and package boilers, boiler mountings and accessories.
4. Introduction to steam and gas turbines, condensers, air-compressors and vacuum pumps.
5. Introduction to refrigeration and air conditioning systems.
 - (a) Introduction/ Demonstration; should be given for each of following shops/trade which include importance of the shop/trade in the engineering. New materials available tools/equipments required indicating the use of each tool/equipment. Method of processing any special machines, power required etc.
 - (1) Joining Processes
 - (2) Sheet metal work
 - (3) Plumbing (Metallic and Non-metallic pipefitting)
 - (4) Electroplating
 - (5) Metal cladding and painting
 - (6) Manufacture of plastic products.
 - (7) Metal machining-Turning, drilling, grinding etc.
 - (b) Exercise and Term work: Each student is required to prepare simple exercises in the following so as to have a feel of how the jobs/parts are prepared and use of tools/equipments (Any four)
 - (1) Electroplating - 1 No.
 - (2) Painting and metal cladding - 1 No.
 - (3) Sheet Metal work - 1 No.
 - (4) Plumbing- 1 No./ Fitting - 1 No.
 - (5) Arc Welding/ Gas Welding/ Welding - 1 No.
 - (6) Soldering/ Brazing - 1 No.
 - (7) Drilling practice - 1 No.Over and above these exercises, each student is required to prepare a laboratory report on instruction/ demonstration and exercises prepared by him as a part of term-work of as above.

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- * Paper to be divided in two parts.
(1) Civil Engg. - 50 Marks
(2) Mech. Engg - 50 Marks

- * Term-work marks to be distributed as:
Civil Engg. - 25 Marks
Mech. Engg. - 25 Marks
W/S Practice - 50 Marks

- * Text Books:

1. Surveying vol-1 By B.C.Punmia.
2. Basic Civil Engg. By P.D.Deshpande
3. Elements of heat engine By R.C.Patel
4. Elements of heat engine By N.C.Pandya & C.S.Shah
5. Basic Engineering thermodynamics By Rayner Joel.
6. Elements of Mechanical Engineering By S.B.Mathur and D.Domkundwar
7. Irrigation and Hydrology By B.C. Punmia
8. Water supply Engineering By S.K. Garg