Chhattisgarh Swami Vivekanand Technical University

Scheme of Examination of I & II Sem Papers

for Lateral Entry of Students of B.Sc. (Mathematics)

S.No.	Subject Code	Subjects	Theory Exam		Practical Exam	
			Max Marks	Minimum Pass Marks	Max Marks	Minimum Passing Marks
1	300211 (37)	Engineering Graphics	80	28	-	-
2	300012 (20,24)	Engineering –I (Sec A – Basic Civil Engg & Sec B –Basic Electrical Engg)	80	28	-	-
3	300013 [37,(1,2)]	Engineering – II (Sec-A Engg. Mechanics & Sec B- Basic Mechanical Engg)	80	28	-	-
4	300124 (37)	Workshop	-	-	40	20

Note (1)   The Candidates will be required to pass all above subjects before admission to VI semester.

(2)   The syllabi of the Subjects 300211(37) Engineering Graphics & Workshop 300124 (37) will be as per the existing syllabi of II & I Sem respectively.

(3)   The Lateral Entry B.Sc. Students seeking admission in B.E. III sem engineering courses are few in numbers. They have to prepare the above subjects themselves and pass the examinations.

Likewise they are required to attain skill in workshop practice to pass the Practical examination.

The principal of the concerned colleges are expected to extend necessary help and facilities to such admitties.

Chhattisgarh Swami Vivekanand Technical University

Semester : I/II   Branch : Common and Lateral Entry (B Sc)
Subject : Engineering Graphics   Code : 300211 (37)
Total Marks : 80   Min Passing Marks : 28

UNIT – I

a)   Importance of Engineering Drawing, Scales: Representative Fraction, Type of Scale, Plain and Diagonal Scale.
b)   Engineering Curves: Conic section, Ellipse, parabola, hyperbola, Cycloidal Curves: Cycloid, Epicycloid, Hypocycloid, Involute.

UNIT – II

a)   Projection: Introduction, Principle of Projection, method of projection, planes of projection, four quadrants, first and third angle projection, reference line symbols for methods of projection, Orthographic projection.
b)   Projection of Points: Introduction point situated in first, second, third & fourth quadrant.
      Projection of lines: Introduction, line parallel to one or both the planes, line contained by one or both the planes, line perpendicular to one of the planes, line inclined to one plane and parallel to other. Line inclined to both the planes. [Simple problems only]

UNIT – III

a)   Projections of planes: Introduction, types of planes, projection of planes, projection of planes perpendicular to both the reference planes, perpendicular to one plane and parallel to the other plane, perpendicular to one plane and inclined to the other plane.
b)   Projections of Solids: Introduction, types of solids, projections of solids in simple position, projections of solids with axes inclined to one of the reference planes and parallel to the other, projections of solids with axes inclined to both H.P. and the V.P., section planes, types of sections, true shape of section, section of solids.

UNIT – IV
a)   Development of Surfaces: Introduction, methods of development, development of lateral surfaces of right solids, cube, prisms, cylinders, pyramids & cone.
b)   Isometric Projection: Introduction, Isometric axes, lines & planes, Isometric scale, Isometric projection and Isometric view of simple objects.

UNIT – V

Computer Aided Drawing: Introduction to CAD, benefits and limitation of CAD, CAD Softwares, AutoCAD introduction, Basic Commands of AutoCAD, Concept of Layers, Dimensioning and text, Creation of two dimensional drawing.

TEXT BOOKS:
(i)   Bhatt, N.D., "Elementary Engineering Drawing", Charotar Book Stall, Anand
(ii)   George Omura, " Mastering AutoCAD" B.P.B. Publication, New Delhi

REFERENCE BOOKS:

(i)   Engineering Graphics – Laxminarayanan & V. and Vaish Wanar, R.S. Jain Brothers, New Delhi
(ii)   Engineering Graphics – Chandra, AM & Chandra Satish 1998.
(iii)   Engineering Graphics – K.L. Narayan and P. Kannaih, Tata McGraw Hill
(iv)   A Text book of Engineering Drawing (Plane & Solid Geometry) – N.D. Bhatt & V.M. Panchal, Charotar Publishing House
(v)   The Fundamental of Engineering drawing and Graphics Technology – French and Vireck, McGraw Hill.

Chhattisgarh Swami Vivekanand Technical University

Semester : I/II   Branch : Lateral Entry (B Sc)
Subject : Engineering II (Basic Civil Engg   Code : 300012 (20,24)
& Basic Electrical Engg)
Total Marks : 80   Min Passing Marks : 28

Section A :   300012(20) Basic Civil Engg   **Max Marks 40**

UNIT- 1 :- BUILDING CONSTRUCTION   (13 Marks)
Bearing Capacity: - Necessity of foundations, Definitions of safe bearing capacity, ultimate bearing capacity and factor of safety, considerations of failure of soil and settlement of foundation for deciding ultimate bearing capacity.
Load bearing and framed construction: - Load bearing wall type and framed types of construction
Types of foundations: - Sketches of spread footing for walls, Rectangular R.C.C. footing for columns and raft- foundation for a group of columns.
Foundation Soils: - Black cotton soil, its expansion and shrinkage, building cracks due to it, use of framed construction or under-reamed pile for B.C. soil. Good soils for foundations viz, moorum, yellow soil or silt and rock.

UNIT-2 :- BUILDING MATERIAL   (13 Marks)
Bricks:- Nominal and actual dimensions of modular and traditional bricks, frog, Good brick earth, moulding, characteristics of good bricks, compression test and absorption test, classification of bricks.
Cement: -   Raw materials, wet process for manufacture of Portland cement, initial and final setting times, use of vicat needle apparatus, Grades of Cement.
Concrete: - Ingredients of concrete meaning of M-10, M-15, and M-20 grades, and nominal mix proportions for them, curing, Properties of Concrete.
Aggregate: - Coarse and Fine aggregates, grading curve and fineness modulus.

UNIT-3 :- SURVEYING & LEVELLING   (14 Marks)
Chain Survey: - The whole to part principle, reconnaissance, index map, instruments used, selection of survey- stations, chain-lines, off-sets, oblique-offset, tie-lines, check-lines, ranging, field book, plotting.
Compass Survey: - The prismatic compass, definition and types of meridian, dip and declination, whole circle bearing, fore bearing and back bearing, local attraction, calculations of included angles for closed and open traverses.
Leveling: - Various parts of a dumpy level, temporary adjustments, interrelationship of bubble tube axis Line of collimation and vertical axis, leveling staff, technical terms used in leveling, level field book, arithmetical checks and problems of leveling, Contours and its characteristics.

BOOKS RECOMMENDED:
1**.** Comprehensive Basic Civil Engineering   : B.C. Punmia
2**.** Basic Civil Engineering   : Ramamurutham
3. Surveying Vol. 1   : B.C.Punmia
4. Building Construction   : Ahuja & Birdi

Section B :   300012 (24) Basic Electrical Engg   **Max Marks 40**

Unit IV – Circuit Fundamentals: - Kirchoff's Laws, Node voltage and mesh current method, delta-star and star-delta conversion, classification of network elements (active passive, linear/nonlinear, lumped, distributed etc.) Superposition theorem, Thevenin's theorem, Norton's theorem (using only independent sources).

(13 Marks)

Unit V – Single Phase AC Circuit fundamentals: - Solution of RLC series circuit, j-operator, complex representation of impedance / admittance, phasor diagram, power in complex notation, solution of parallel and series- parallel circuit, series and parallel resonance.

(13 Marks)

Unit VI – Magnetic Circuit and Transformer: B-H curve, AT calculation of simple magnetic, circuits, hysteresis and eddy current losses.
Single Phase Transformer, E.M.F. equation, rating, phasor diagram on no load and full load, equivalent circuit, regulation, losses, efficiency, OC and SC test. ,

(14 Marks)

Books Recommended :
1. Basic Electrical Engineering by Fitzrald & Higginbotham
2. Electrical Technology by Smith I.N. Hughes- Pearson Education Asia

Chhattisgarh Swami Vivekanand Technical University

Semester : I/II   Branch : Lateral Entry (B Sc)
Subject : Engineering II   Code : 300013 [37,(1,2)]
          (Engineering Mechanics & Basic Mechanical Engg)
Total Marks : 80   Min Passing Marks : 28

Section A :   300013[37(1)] Engineering Mechanics   40 Marks

Unit-I
[A]   EQUILIBRIUM OF FORCES AND COUPLES :
Free body diagram; Resultant of plane concurrent and non-concurrent forces; Conditions of equilibrium- Analytical and graphical methods; Application in solving simple problems.

[B]   ANALYSIS OF PLANE TRUSSES
Analysis of forces in structural members: Method of joint and method of section Analytical and graphical methods.

[14 Marks]

Unit -II
SHEAR FORCE AND BENDING MO
MENT DIAGRAM
Types of supports for beams, Beams subjected to concentrated loads and uniformly distributed loads; Shear force and bending moment at any section of beam Analytical methods and graphical methods, Force polygon and couple polygon. Reactions at supports.

[13 Marks]

Unit -III
MOMENT OF INERTIA OF PLANE LAMINA
Parallel axis theorem and perpendicular axis theorem; product of inertia; Moment of inertia about an inclined axis; Principle axis of moment of inertia and position of principle axis.

[13 Marks]

Books Recommended :
1. I. B. Prasad : A text book of Applied Mechanics, Khanna Pub., Delhi
2. A. K. Tayal : Engineering Mechanics (Statics and Dynamics); Umesh Pub., Delhi
3. S. Tomoshenko and D.H. Youngh : Engineering Mechanics
4. Bear F. P. & Jonston F.R. : Mechanics for Engineers; McGraw Hills

Section B :   300013[37(2)] Basic Mechanical Engineering   40 Marks

Unit -IV

[A]   Thermodynamic System and Control Volume Thermodynamic property. Zeroth law of thermodynamics.

[B]   Work and Heat : Work and Heat as Path function, Flow work, Non-flow process versus flow process, work done in frictionless Quasi-Equilibrium process, First Law of thermodynamic:- 1st law of thermodynamics and its application to non-flow process and steady flow process. .

[14 Marks]

Unit – V

Second law of thermodynamics: Corollary 1 and 2,. Clausius inequality. Carnot cycle Entropy :- A point function, principle of increase of entropy for close system and surroundings, causes of increase in entropy, Entropy change during different thermodynamic processes.

[13 Marks]

Unit -VI

[A]   Properties of Steam :- Wet, Saturated and Superheated Steam, Phase transformation at constant pressure, sensible heat, latent heat, superheat, Internal energy, Enthalpy. Dryness fraction, steam processes:- Constant Volume, Adiabatic, isothermal, Polytropic, Entropy of Steam.

[B]   Classification of Boiler, boiler mountings and Accessories.

[13 Marks]

Books Recommended :

1.	Thermodynamics & Heat Engine	-	R. Yadav (Vol. I & II)
2.	Engineering Thermodynamics	-	P.K. Nag
3.	Thermodynamic Approach	-	D.S. Kumar
4.	Engineering Thermodynamics	-	C. P. Arora

Chhattisgarh Swami Vivekanand Technical University

Semester : I/II   Branch : Common and Lateral Entry (B Sc)
Subject : Workshop   Code : 300124 (37)
Total Marks : 40   Min Passing Marks : 20

CARPENTRY:
Timber, Definition, Engineering Application, Types of Wood, Seasoning and Preservation, PlyWood, PlyBoards.

Practical Work: T Lap Joint
                         End Lap Joint

FOUNDRY:
Moulding Sands, Constituents and Characteristics, Pattern, Definition Material, Types, Core Prints, Role of Gate runner, riser, core, casting defects like blow holes & cavities.

Practical Work: Mould of any pattern
                         Casting of simple pattern

WELDING:
Welding , Brazing and soldering process and their applications. Oxy-acetylene gas welding process, Type of flame & their application. Manual & Metal arc welding technique and equipment, AC & DC welding, Constituents and functions of electrode coating, welding positions, type of weld joints, Common welding defects.

Practical Work:
1.   Lap Joint by Gas Welding
2.   Square butt joint Arc welding
3.   Lap joint by Arc welding
4.   Demonstration of brazing

METAL CUTTING:
Introduction to machining and common machining operations. Cutting tool material, Definition of machine tools, specification and block diagram of lathe, Shaper Drilling machine and grinder. Common lathe operations such as turning, parting, chamfering and facing. Quick return mechanism of shaper, Difference between drilling and boring, Files-Material classification.

Practical Work –
FITTING
1.   Preparation of step cutting Job, out of 5mm thick strip.
2.   Preparation of 'V' notch 'V' groove, out of 5mm thick strip.
3.   Preparation of Male-Female joint our of 5 mm thick strip.

TURNING
1.   Job on Lathe with one plane turning chamfering operations.
2.   Job on Lathe with one step turning
3.   Job on shaper for finishing two sides of a Job.

4.   Drilling two holes of size 5mm and 12mm diameter on job used / to be used for shaping.

FORGING:

Forging principle, Material, Operations like drawing, upsetting, bending and forge welding, use of forged parts.

Exposure to High Tech Area: Exposure to High Tech Area like Plastic Injection Moulding, Die Casting, Diamond Cutting PCB Manufacturing, CNC manufacturing Latest Techniques in Welding etc. Should be imparted through factory visit and audio-visual means.

Latest Techniques in Welding

REFERENCE BOOKS:

-      Chapman, W.A.J. and Arnold E., "Workshop Technology" Vol. I & III, Viva Low price student Edition, 1998
-      Chaudhary, Hajra, "Elements of Workshop Technology" Media Promoters & Publishers, 1997.
-      Raghuwanshi, B.s., "Workshop Technology" Vol I 7 II, Dhanpat Rai and Sons 1998.