

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 1/4
Branch	ELECTRICAL ENGINEERING			Semester	III
Course Code	3 0 1	Course Name	D C Machines and Transf ormers	6840	
Course Outcome 1	Describe constructional details of DC machine, explain working principle and calculate performance of DC generator			Teach Hrs	Marks
Learning Outcome E0130111	Describe various parts of DC machine, explain working principle of DC generator, classify DC generator and their applications. <i>(Cognitive domain)</i>			10	12
Contents	<ul style="list-style-type: none"> Construction of DC machine: Parts - materials and their functions, armature windings. DC generator: Working principle, armature reaction, commutation, interpoles, compensating winding, classification and applications. 				
Method of Assessment	<i>External : End Semester Theory Exam - Pen paper test</i>				
Learning Outcome E0130112	Derive emf equation and calculate induced emf, losses & efficiency of DC generators. <i>(Cognitive domain)</i>			6	8
Contents	<ul style="list-style-type: none"> Emf equation, losses & efficiency of DC generators. Numerical problems related to emf, losses and efficiency. 				
Method of Assessment	<i>Internal: Mid Semester Exam 1 - Pen paper test & Assignment</i>				
Learning Outcome E0130113	Plot the magnetization and internal characteristics of DC shunt generator. <i>(Psychomotor & affective domain)</i>			6	7
Contents	<ul style="list-style-type: none"> Magnetization and internal characteristics of DC shunt generator. 				
Method of Assessment	<i>Internal: Performance of Task, observation & Viva Voce.</i>				
Learning Outcome E013011 4	Plot the load characteristics of DC shunt generator. <i>(Psychomotor domain)</i>			8	10
Contents	<ul style="list-style-type: none"> Load characteristic of DC shunt generator. 				
Method of Assessment	<i>External: End Semester Practical Exam - Performance of Task & Viva Voce</i>				
Course Outcome 2	Select type of DC motor for a given application, apply speed control methods and conduct tests of DC motors.			Teach Hrs	Marks
Learning Outcome E0130121	Explain working principle of DC motor, classification, applications and describe construction, working and applications of Brushless DC motor. <i>(Cognitive domain)</i>			6	7

Contents	<ul style="list-style-type: none"> Principle of operation, back emf and its significance, torque equation, classification of DC motors. Construction, working and applications of Brushless DC motor. 		
Method of Assessment	<i>Internal: Mid Semester Exam 1 - Pen paper test & Assignment</i>		
Learning Outcome E0130122	Explain performance characteristics, starting methods of DC motors and calculate back emf, torque, speed, losses and efficiency. <i>(Cognitive domain)</i>	10	12
Contents	<ul style="list-style-type: none"> Characteristics and starting methods of DC motors. Necessity of starters, construction & working of three point and four-point starter. Speed control of DC shunt and series motor: Flux and Armature control method. Numerical related to back emf, torque, speed, losses and efficiency. 		
Method of Assessment	<i>External : End Semester Theory Exam - Pen paper test</i>		
Learning Outcome E0130123	Apply field and armature control methods to vary speed of DC shunt motor. <i>(Psychomotor domain)</i>	8	10
Contents	<ul style="list-style-type: none"> Field and armature control methods of DC shunt and series motor. 		
Method of Assessment	<i>External: End Semester Practical Exam - Performance of Task, Viva Voce.</i>		
Learning Outcome E0130124	Perform Swinburne and brake test on DC motor. <i>(Psychomotor & affective domain)</i>	6	8
Contents	<ul style="list-style-type: none"> Swinburne's test on DC shunt motor. Brake test on DC series motor. 		
Method of Assessment	<i>Internal: Performance of Task, observation & Viva Voce.</i>		
Course Outcome 3	Classify types of single phase transformer and determine its performance by conducting various tests.	Teach Hrs	Marks
Learning Outcome E0130131	Describe construction, explain working principle, derive emf equation and classify single phase transformer. <i>(Cognitive domain)</i>	6	8
Contents	<ul style="list-style-type: none"> Construction of transformer: Parts-materials and their functions. Principle of operation, emf equation, transformation ratio and name plate rating. Types of transformer: Shell type and core type, step up and step down, distribution and power transformer. 		
Method of Assessment	<i>Internal: Mid Semester Exam 2- Pen paper test & Assignment</i>		
Learning Outcome E0130132	Draw & explain equivalent circuits, phasor diagrams and determine efficiency & voltage regulation of single phase transformer. <i>(Cognitive domain)</i>	10	14
Contents	<ul style="list-style-type: none"> Equivalent circuits and phasor diagrams. Losses, efficiency, condition for maximum efficiency, All day efficiency and voltage regulation. 		

	<ul style="list-style-type: none"> Numerical problems. 		
Method of Assessment	<i>External : End Semester Theory Exam –Pen paper test</i>		
Learning Outcome E0130133	Conduct various tests of single phase transformer and perform parallel operation of two single phase transformer. <i>(Psychomotor domain)</i>	12	15
Contents	<ul style="list-style-type: none"> Perform polarity test on a single phase transformer. Perform open circuit & short circuit test on single phase transformer and determine voltage regulation and efficiency. Perform parallel operation of two single phase transformers. 		
Method of Assessment	<i>External: End Semester Practical Exam - Performance of Task & Viva Voce.</i>		
Course Outcome 4	Compare and illustrate various types of 3-phase transformer.	Teach Hrs	Marks
Learning Outcome E0130141	Compare single unit of three phase transformer with bank of 3 single phase transformers and sketch the different types of connections of 3-phase transformers including vector groups. <i>(Cognitive domain)</i>	10	12
Contents	<ul style="list-style-type: none"> Bank of 3 single phase transformers, single unit of three phase transformer. Connections, vector groups, Scott and open delta connection. 		
Method of Assessment	<i>External : End Semester Theory Exam - Pen paper test</i>		
Learning Outcome E0130142	Explain need and condition of parallel operation of three phase transformer and describe criteria for selection of distribution and power transformer. <i>(Cognitive domain)</i>	6	7
Contents	<ul style="list-style-type: none"> Need and conditions of parallel operation of three phase transformer. Cooling methods and criteria for selection of distribution transformer and power transformer as per- IS: 10028 (Part-1)-1985. 		
Method of Assessment	<i>Internal: Mid Semester Exam 2 - Pen paper test & Assignment</i>		
Course Outcome 5	Select special purpose transformers for various applications	Teach Hrs	Marks
Learning Outcome E0130151	Describe constructional features and working principles of various special purpose transformers. <i>(Cognitive domain)</i>	10	12
Contents	<ul style="list-style-type: none"> Single phase and three phase auto transformers: Construction and working principle. Instrument transformers: Construction and working of Current transformer & Potential transformer. Isolation transformer: Constructional features Single phase welding transformer: Constructional features. 		

	<ul style="list-style-type: none"> • Pulse transformer: Constructional features. 		
Method of Assessment	<i>External : End Semester Theory Exam - Pen paper test</i>		
Learning Outcome E0130152	State applications of different type of special purpose transformers.	6	8
Contents	Applications of- <ul style="list-style-type: none"> • Single & three phase auto transformers. • Instrument transformers. • Isolation transformer. • Single phase welding transformer and • Pulse transformer. 		
Method of Assessment	<i>External: End Semester Theory Exam - Pen paper test</i>		

Reference Books:

1. P.S. Bimbhra, Electrical Machines, Vol-I, II, Khanna Book Publishing House (ISBN: 978-9386173-447, 978-93-86173-607), New Delhi
2. Kothari, D. P. and Nagrath, I. J., Electrical Machines, McGraw Hill Education. New Delhi, ISBN: 9780070699670
ISBN: 9780070593572
3. Theraja B.L., Electrical Technology Vol-II (AC and DC machines), S. Chand and Co. Ltd., New Delhi, ISBN: 9788121924375
4. Bhattacharya, S. K., Electrical Machines, McGraw Hill Education, New Delhi, ISBN: 9789332902855
5. Mehta, V. K. and Mehta, Rohit, Principles of Electrical Machines, S. Chand and Co. Ltd., New Delhi, ISBN: 9788121930888
6. Mittle, V.N. and Mittle, Arvind., Basic Electrical Engineering, McGraw Hill Education, New Delhi,
- 7.S.K. Sahdev, Electrical Machines, Cambridge University Press,ISBN:9781108431064
8. M. K. Deodiya, Vidhyut Machine (Hindi), Madhya Pradesh Hindi Granth Academy, Bhopal.

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/6
Branch	Electrical Engineering		Semester	3	
Course Code	302/6841	Paper code	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)/6841		
Course Outcome 1	Identify various type of measuring instruments		Teach Hrs	Marks	
Learning Outcome E0130211	Explain fundamentals of measuring instruments (Cognitive domain)		7	10	
Contents	<ul style="list-style-type: none"> • Measurement: Significance, units, fundamental quantities and standards. • Static and dynamic characteristics of instruments, types of errors. • Calibration: Need and procedure. 				
Method of Assessment	Internal: Assignment and viva voce				
Learning Outcome E0130212	Classify measuring instruments (Cognitive domain)		6	9	
Contents	<ul style="list-style-type: none"> • Static and dynamic characteristics, types of errors. • Calibration: Need and procedure. • Classification of Instruments: Null and deflection type instruments, absolute and secondary instruments, analog and digital instruments, indicating, recording and integrating instruments. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130213	Calibrate given measuring instruments (Psychomotor domain)		4	6	
Contents	<ul style="list-style-type: none"> • To perform calibration and calculation of errors for Ammeter and Voltmeter • To perform calibration and calculation of errors for Wattmeter. 				
Method of Assessment	Internal: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 2/6
Branch	Electrical Engineering		Semester	3	
Course Code	302/6841	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)		
Course Outcome 2	Use different types of measuring instruments for measuring current, voltage and frequency.			Teach Hrs	Marks
Learning Outcome E0130221	Explain basics of electrical measuring instruments and their construction (Cognitive domain)			7	10
Contents	<ul style="list-style-type: none"> Basics of measuring instruments. Electrical measuring instruments: Construction of PMMC meter, Electrodynamometer, Moving iron and Induction type instruments. Construction of Instrument transformers and Tong tester. Frequency meter: Construction of Weston and Resonance type meter. 				
Method of Assessment	Internal: Mid semester-I theory examination (Pen paper test)				
Learning Outcome E0130222	Identify use of electrical measuring instruments and explain their working (Cognitive domain)			7	9
Contents	<ul style="list-style-type: none"> Electrical measuring instruments: Operation of PMMC meter, Electrodynamometer, Moving iron and Induction type instruments Working of instrument transformers. Frequency meter: Operation of Weston and Resonance type meter. Extension of range of Ammeter and Voltmeter using shunt, multiplier, CT and PT. Simple numerical problems. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130223	Extend the range of instruments for given requirement (Psychomotor domain)			6	9
Contents	<ul style="list-style-type: none"> To measure current and voltage using C.T. and P.T. for extension of instrument range. 				
Method of Assessment	Internal: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 3/6
Branch	Electrical Engineering			Semester	3
Course Code	302/6841	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)		
Course Outcome 3	Use different types of measuring instruments for measurement of power, energy and power factor.			Teach Hrs	Marks
Learning Outcome E0130231	Explain construction of instruments used in power and energy measurement (Cognitive domain)			7	10
Contents	<ul style="list-style-type: none"> • Dynamometer type Wattmeter: Construction. • Single phase and three phase electronic energy meter: Constructional features (block diagram). • Dynamometer type power factor meter and digital power factor meter (block diagram) 				
Method of Assessment	Internal: Mid semester-II theory examination (Pen paper test)				
Learning Outcome E0130232	Make use of various instruments for measurement of power, energy and power factor (Cognitive domain)			10	14
Contents	<ul style="list-style-type: none"> • Power measurement using Voltmeter - Ammeter method. • Dynamometer type Wattmeter: Working, errors, compensations and extension of range of Wattmeter using CT and PT. • Single phase and three phase electronic energy meter: Working principle and constructional features (block diagram). • Dynamometer type power factor meter and digital power factor meter (block diagram) • Synchroscope: Working principle and application. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130233	Use of given instrument for measurement of electrical quantities (Psychomotor and affective domain)			10	14
Contents	<ul style="list-style-type: none"> • Measurement of P.F. by Ammeter, Voltmeter and Wattmeter method. • Measurement of 3-phase power by two Wattmeter method and follow standard safety norms. • Demonstration and measurement of energy by digital Energy meter. 				
Method of Assessment	External: Performance of given task and Observation / viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 4/6
Branch	Electrical Engineering		Semester	3	
Course Code	302/6841	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)		
Course Outcome 4	Measure circuit parameters using DC and AC bridges.		Teach Hrs	Marks	
Learning Outcome E0130241	Apply various methods used to measure resistance (Cognitive domain)		8	11	
Contents	<ul style="list-style-type: none"> • Measurement of resistance • Low resistance: Kelvin's double bridge. • Medium resistance: Voltmeter-Ammeter method, Wheatstone bridge. • High resistance: Megger and Ohm meter. • Earth resistance: Earth tester. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130242	Use of AC bridges for measurement of inductance, capacitance and frequency (Cognitive domain)		7	9	
Contents	<ul style="list-style-type: none"> • Measurement of self-inductance: Maxwell's bridge, Hay's bridge, Anderson bridge (No phasor diagrams). • Measurement of capacitance: De-Sauty's bridge & Schering bridge (No phasor diagram) • Measurement of frequency by Wien's bridge. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130243	Measure given electrical circuit parameters (Psychomotor domain)		8	12	
Contents	<ul style="list-style-type: none"> • Measurement of low resistance by Kelvin's Double bridge. • Measurement of medium resistance by Wheatstone bridge. • Measurement of insulation resistance by Megger. • Measurement of inductance by Maxwell's bridge. 				
Method of Assessment	External: Performance of given task / viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 5/6
Branch	Electrical Engineering		Semester	3	
Course Code	302/6841	Course Name	Electrical and Electronics Measurements and Measuring Instruments (EEMMI)		
Course Outcome 5	Apply electronic and digital instruments for measurement of various electrical quantities.			Teach Hrs	Marks
Learning Outcome E0130251	Explain working of oscilloscope and utilize it for measurement of various electrical quantities (Cognitive domain)			6	9
Contents	<ul style="list-style-type: none"> • Single & dual trace CRO: Basic block diagram, specification & working, Cathode ray tube, electrostatic deflection, vertical amplifier, time base generator, horizontal amplifier. • Use of CRO: Measurement of voltage, time period, frequency & phase difference (Lissajous patterns). • Digital Storage Oscilloscope (DSO): Block diagram and functioning. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130252	Use of electronic and digital instruments for measurement of various electrical quantities (Cognitive domain)			6	9
Contents	<ul style="list-style-type: none"> • Electronic Voltmeter: Block diagram and functioning of TVM, FETVM and Rectifier type voltmeter. • Digital LCR meter: Block diagram and functioning. • Digital Voltmeter: Block diagram and working of ramp type DVM. • Digital frequency meter: Block diagram and functioning. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130253	Perform measurement of voltage, frequency and phase difference by oscilloscope (Psychomotor domain)			6	9
Contents	<ul style="list-style-type: none"> • Use of CRO for measurement of voltage, frequency and phase difference. • Demonstration of digital storage oscilloscope. 				
Method of Assessment	External: Performance of given task and viva voce				

REFERENCE BOOKS:

S.N.	Title& Publication	Author
1	Electrical and Electronics Measurements and Instrumentation., Dhanpai Rai and Co., New Delhi, ISBN : 9780000279744	Sawhney A.K.
2	Electrical Measurements, Technical Publication Pune.	Bakshi U. A., Bakshi A. V. and Bakshi K. A.
3	A Text Book of Electrical Technology Vol-I (Basic Electrical Engg.), S. Chand and Co. New Delhi, ISBN: 9788121924405	Theraja B. L. and Theraja A. K.
4	Electrical and Electronic Measurement and Instrumentation, S. Chand and Co. New Delhi, ISBN : 9789385676017	Rajput R.K.
5	Modern Electronic Instruments and Measurement Techniques, PHI, ISBN: 9788120307520	Helfrick A. D. and Cooper W. D.
6	Electrical Measurements and Measuring Instruments, Wheeler's Publishing, ISBN: 9788190630726, 8190630725	Widdis F. C. and Golding E. W.
7	Electrical Measurements and Measuring Instruments, S. K. Kataria and sons, Delhi, ISBN: 9788188458264	Gupta J. B.

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 1/5
Branch	Electrical Engineering			Semester	III
Course Code	303	Course Name/CODE	Electrical circuits/68 42		
Course Outcome 1	Analyse electrical circuits			Teach Hrs	Marks
Learning Outcome E0130311	Explain electrical circuit terms and elements (Cognitive domain)			4	5
Contents	<ul style="list-style-type: none"> • Circuit terms: Mesh, loop, node, branch, junctions of a network. • Sources: Ideal and practical voltage, Ideal and practical current source, sources transformation • Classification of Elements: Active and passive elements, unilateral and bilateral elements, linear and nonlinear elements, 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130312	Calculate the current, voltage, power in a given DC circuit using loop and Nodal method (Cognitive domain)			8	10
Contents	<ul style="list-style-type: none"> • Kirchhoff current law, Kirchhoff voltage law • Loop and Nodal method • Problem based on Kirchhoff current law, Kirchhoff voltage law, loop and Nodal method 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130313	Determine Z and Y parameters of T and π network (Psychomotor domain)			4	5
Contents	<ul style="list-style-type: none"> • To determine Z -parameter of T and π network • To determine Y-parameter of T and π network • To simulate T and π network for determining Z and Y parameters 				
Method of Assessment	External: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 2/5
Branch	Electrical Engineering			Semester	3
Course Code	303	Course Name	Electrical circuit/6842		
Course Outcome 2	Apply network theorems in electrical circuit.			Teach Hrs	Marks
Learning Outcome E0130321	Explain different theorems and solve DC circuit using a given theorem (Cognitive domain)			8	10
Contents	<ul style="list-style-type: none"> • Superposition theorem • Thevenin's theorem • Maximum Power Transfer Theorem • Problems based on above theorems 				
Method of Assessment	Internal: Mid semester-I theory examination (Pen paper test)				
Learning Outcome E0130322	Calculate the current, voltage in a given DC circuit using theorem. (Cognitive domain)			12	15
Contents	<ul style="list-style-type: none"> • Superposition theorem • Thevenin's theorem • Norton's theorem • Maximum Power Transfer Theorem • Numerical problems based on above theorems 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130323	Perform experiment on a given theorem and find the parameters (Psychomotor domain)			8	10
Contents	<ul style="list-style-type: none"> • To find branch current using Superposition theorem • To find load current using Thevenin's theorem 				
Method of Assessment	External: Performance of given task / viva voce				
Learning Outcome E0130324	Perform experiment on a given theorem and find the parameters (Psychomotor domain)			8	10
Contents	<ul style="list-style-type: none"> • To find load current using Norton's theorem. • To find load resistance for Maximum Power Transfer • To simulate electrical circuit for verification of Norton's theorem and Maximum Power Transfer theorem 				
Method of Assessment	Internal: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 3/5
Branch	Electrical Engineering			Semester	3
Course Code	303	Course Name	Electrical circuit/6842		
Course Outcome 3	Determine electrical quantities of single phase AC circuit			Teach Hrs	Marks
Learning Outcome E0130331	Represent AC quantities and Calculate electrical quantities of single phase AC circuit (Cognitive domain)			12	15
Contents	<ul style="list-style-type: none"> Representation of AC quantities by phasor method, Conversion of polar to rectangular and vice versa. RL, RC, RLC series and parallel circuits. combination of AC circuits, impedance, admittance, reactance, phasor diagram, impedance triangle, power factor, active power, reactive power, apparent power, power triangle. Resonance in AC circuits, bandwidth, Q factor. Numerical problems on AC fundamentals 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130332	Explain AC quantities and solve given single phase AC circuit (Cognitive domain)			8	10
Contents	<ul style="list-style-type: none"> Representation of AC quantities by phasor method, Conversion of polar to rectangular and vice versa. RL, RC, RLC series and parallel circuits. combination of AC circuits, Impedance, admittance, reactance, phasor diagram, impedance triangle, power factor, active power, reactive power, apparent power, power triangle. Resonance in AC circuits, bandwidth, Q factor. 				
Method of Assessment	Internal: Mid semester-II theory examination (Pen paper test)				
Learning Outcome E0130333	Measure electrical quantities of single phase AC circuit (Psychomotor domain)			8	10
Contents	<ul style="list-style-type: none"> To determine parameters impedance, admittance, reactance of given RLC series circuit. To determine active power, reactive power, apparent power and power factor of given RLC series circuit. To measure resonance frequency of given RLC series circuit. 				
Method of Assessment	External: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 4/5
Branch	Electrical Engineering		Semester	3	
Course Code	303	Course Name	Electrical circuit/6842		
Course Outcome 4	Determine electrical quantities of three phase AC circuit			Teach Hrs	Marks
Learning Outcome E0130341	Explain concepts and solve problems on three phase AC circuit (Cognitive domain)			8	10
Contents	<ul style="list-style-type: none"> Phasor and complex representation of three phase supply, Phase sequence and polarity Three phase power, active, reactive and apparent power in star and delta system for balanced load. 				
Method of Assessment	Internal: Assignment and Quiz				
Learning Outcome E0130322	Determine parameter of three phase AC circuit (Cognitive domain)			8	10
Contents	<ul style="list-style-type: none"> Phasor and complex representation of three phase supply, Phase sequence and polarity Phase and line quantities in three phase star and delta system for balanced load. Three phase power, active, reactive and apparent power in star and delta system for balanced load. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130323	Perform experiment on three phase AC circuit (Psychomotor and affective domain)			8	10
Contents	<ul style="list-style-type: none"> To verify relation between Phase and line voltage, current in a star network and follow standard safety norms. To verify relation between Phase and line voltage, current in a delta Network and follow standard safety norms. 				
Method of Assessment	External: Performance of given task and Observation / viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 5/5
Branch	Electrical Engineering		Semester	3	
Course Code	303	Course Name	Electrical circuit/6842		
Course Outcome 5	Interpret transient response of an electrical circuit.			Teach Hrs	Marks
Learning Outcome E0130351	Determine time constant (τ)' for R-L and R-C circuit and explain performance (Cognitive domain)			12	15
Contents	<ul style="list-style-type: none"> Initial and final condition for inductors, capacitors DC transients and steady state response of a series R-L circuit and R-C Circuit 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0130352	Calculate time constant (τ)' for R-L and R-C circuit and explain its performance (Psychomotor domain)			4	5
Contents	<ul style="list-style-type: none"> To simulate R-L series DC circuit and plot transients and steady state response To simulate R-C series DC circuit and plot transients and steady state Response 				
Method of Assessment	Internal: Performance of given task and viva voce				

REFERENCE BOOKS:

S.N.	Title & Publication	Author
1	Networks & Systems, Khanna Book Publishing, New Delhi.	Ashfaq Husain
2	Basic Electrical Engineering, McGraw Hill Education, Noida, ISBN: 978-00-705-9357-2	Mittle, V.N. ;Mittle, Arvind
3	A Text Book of Electrical Technology Vol-I, S. Chand & Co. Ram-nagar, New Delhi, ISBN : 9788121924405	Theraja, B. L. : Theraja, A. K.,
4	Circuit and network, McGraw Hill Education, New Delhi, ISBN : 978-93-3921-960-4	Sudhakar, A. ; Shyammohan, S. Palli
5	Fundamentals of Electrical Engineering, Cambridge University Press Pvt. Ltd., New Delhi, ISBN : 978-11-0746-435-3	Saxena, S.B Lal; Dasgupta, K
6	Electrical Circuits (Hindi), Satya Prakashan New Delhi	Suresh Kumar Soni & Umesh Kumar Soni

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/2
Branch	ELECTRICAL ENGINEERING		Semester	III	
Course Code	304	Course Name	General Mechanical Engineering6843		
Course Outcome 1	Perform mechanical testing of materials.			Teach Hrs	Marks
Learning Outcome E0130411	Classify engineering materials and their mechanical properties.			05	05
Contents	Engineering materials, need and its classification, properties and uses of metals and alloys: Ferrous metals: cast iron, wrought iron, steel, alloy steel. Non ferrous metals: aluminum, copper, lead, tin, copper tin-antimony alloy, bearing metals, copper tin alloy, zinc, copper zinc alloy. Mechanical properties of materials: stiffness, strength, ductility malleability, elasticity, plasticity toughness, brittleness, hardness and hardenability, fatigue.				
Method of Assessment	Paper pen test				
Learning Outcome E0130412	Perform tensile, compression, shear, hardness, impact tests.			14	20
Contents	Tensile, compression and shear tests using UTM machine. Brinell and Rockwell hardness test using hardness tester. Izod and Charpy test using impact testing machine.				
Method of Assessment	Laboratory test by observation				
Course Outcome 2	Explain two phase system for steam, steam generators.			Teach Hrs	Marks
Learning Outcome E0130421	State laws of thermodynamics.			04	05
Contents	Thermodynamic system, state, properties, process, cycle, work, heat and power, statement of zeroth, Ist, IInd law of thermodynamics.				
Method of Assessment	Paper pen test				
Learning Outcome E0130422	Explain properties of steam.			04	10
Contents	Properties of steam, enthalpy, specific volume, internal energy of dry and wet steam, simple numerical problems.				
Method of Assessment	Theory exam				
Learning Outcome E0130423	Explain construction, working of Babcock and Wilcox boiler, Cochran boiler, LaMont boiler.			08	10
Contents	Boilers, its classification, construction working, Mountings and accessories of a boiler: Babcock and Wilcox boiler, Cochran boiler, LaMont boiler.				
Method of Assessment	Theory exam				
Learning Outcome E0130424	Identify components, mountings, accessories of a given boiler.			07	15
Contents	Demonstration of boiler components, mountings, accessories.				
Method of Assessment	Laboratory test by observation				
Course Outcome 3	Explain internal combustion engines, air compressors.			Teach Hrs	Marks
Learning Outcome E0130431	Explain internal combustion engines.			07	10
Contents	Define heat engine, difference between internal combustion engines, external combustion engine, and classification of internal combustion engines. Construction and working of two strokes and four stroke petrol and diesel engine, indicated horse power, brake horse power, mechanical efficiency of an internal combustion				

	engine.		
Method of Assessment	Theory exam		
Learning Outcome E0130432	Identify components of a given internal combustion engine.	07	15
Contents	Demonstration of internal combustion engine components.		
Method of Assessment	Laboratory test by observation		
RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 2/2
Branch	ELECTRICAL ENGINEERING	Semester	III
Course Code	304	Course Name	General Mechanical Engineering
Learning Outcome E0130433	Explain multistage reciprocating, rotary compressors.	09	10
Contents	Air compressors its classification, construction and working of reciprocating air-compressor, rotary compressor, multistage reciprocating air compressor its merits and demerits, industrial uses of air-compressor.		
Method of Assessment	Paper pen test		
Course Outcome 4	Select hydraulic pumps, turbines for a given situation.	Teach Hrs	Marks
Learning Outcome E0130441	Describe fluid properties and its measurement.	04	10
Contents	Definition of fluid properties, fluid pressure and its measurement, static pressure, intensity of pressure at a point in fluid at rest, pressure head, absolute and gauge pressure, simple and differential U tube manometers.		
Method of Assessment	Quiz		
Learning Outcome E0130442	Solve given problems using Pascal's law, continuity equation, Bernoulli's theorem.	06	10
Contents	Energies in fluid, pressure energy, kinetic energy, potential energy, total energy, Pascal's Law, continuity equation, Bernoulli's theorem, its assumption and application.		
Method of Assessment	Theory exam		
Learning Outcome E0130443	Select hydraulic pumps, turbines for a given situation.	05	10
Contents	Construction and working of hydraulic pumps- reciprocating and centrifugal pump. Construction and working of water turbines- impulse turbine and reaction turbine, factors affecting selection of hydraulic pumps, factors affecting selection of a water turbine.		
Method of Assessment	Theory exam		
Course Outcome 5	Explain power transmission drives.	Teach Hrs	Marks
Learning Outcome E0130451	Describe power transmission, belt drive, gear drive.	07	10
Contents	Methods of power transmission, belt drive, open and cross belt drive, its application and advantages, velocity ratio of pulleys, compound belt drive, effect of slip in the belt drive. Gear drive, simple gear drive, compound gear drive, worm and worm wheel, bevel gear, velocity ratio in gear drive, its merits and demerits.		
Method of Assessment	Theory exam		
Learning Outcome E0130452	Solve a given numerical problem of belt drive, gear drive.	08	10
Contents	Simple numerical problems on belt drive and gear drive.		
Method of Assessment	Theory exam		

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>1</i>	<i>1</i>	4
COURSE NAME	General Mechanical Engineering												
CO Description	Perform mechanical testing of materials.												
LO Description	Classify engineering materials and their mechanical properties.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks				
1.	Engineering materials, need and its classification, properties and uses of metals and alloys: Ferrous metals: cast iron, wrought iron, steel, alloy steel. Non ferrous metals: aluminum, copper, lead, tin, copper tin-antimony alloy, bearing metals, copper tin alloy, zinc, copper zinc alloy. Mechanical properties of materials: stiffness, strength, ductility malleability, elasticity, plasticity toughness, brittleness, hardness and hardenability, fatigue.	Interactive classroom teaching, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.			05	NIL	Handouts, chalk board, PPT, text book, charts.	NIL				
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment				Maximum Marks	Resources Required		External / Internal				
1.	Paper pen test	Student will be asked to list properties and uses of any five metals and alloys.				05	Test paper + rating scale		Internal				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
Part of Progressive – 1													

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>1</i>		<i>2</i>		4
COURSE NAME		General Mechanical Engineering													
CO Description		Perform mechanical testing of materials.													
LO Description		Perform tensile, compression, shear, hardness, impact tests.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process					Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Tensile, compression and shear tests using UTM machine. Brinell and Rockwell hardness test using hardness tester. Izod and Charpy test using impact testing machine.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,	Teacher will demonstrate and explain the working of testing machines and how to perform materials tests on the machine. Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.					NIL	14	Handout/ lab manual, text book, charts, video film.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal				
1.	Laboratory test by observation	Students will be asked to perform one mechanical test for a given job.					20	Observation schedule/check-list /rating scales /rubrics			Internal				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Lab Work															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>2</i>		<i>1</i>		4
COURSE NAME		General Mechanical Engineering													
CO Description		Explain two phase system for steam, steam generators.													
LO Description		State laws of thermodynamics.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Thermodynamic system, state, properties, process, cycle, work, heat and power, statement of zeroth, Ist, IInd law of thermodynamics.	Interactive classroom teaching, tutorial, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.			04	NIL	Handouts, chalk board, PPT, text book, charts, video film.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment						Maximum Marks	Resources Required				External / Internal		
1.	Paper pen test	Students will be asked to state two statements of laws of thermodynamics.						05	Test paper + rating scale				Internal		
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Progressive – 1															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i> <i>0</i> <i>1</i>			<i>3</i> <i>0</i> <i>4</i>			<i>2</i>		<i>2</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain two phase system for steam, steam generators.													
LO Description		Explain properties of steam.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks								
1.	Properties of steam, enthalpy, specific volume, internal energy of dry and wet steam, simple numerical problems.	Interactive classroom teaching, tutorial, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.	04	NIL	Handouts, chalk board, PPT, text book, charts, video film, steam tables, Mollier diagram.	NIL								
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required		External / Internal							
1.	Theory exam	Students will be asked to solve numerical problems based on content.			10	Question paper + rating scale		External							
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>2</i>		<i>3</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain two phase system for steam, steam generators.													
LO Description		Explain construction, working of Babcock and Wilcox boiler, Cochran boiler ,LaMont boiler.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Boilers, its classification, construction working, Mountings and accessories of a boiler :Babcock and Wilcox boiler, Cochran boiler, LaMont boiler.	Interactive classroom teaching, lab demonstration, tutorial, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.			04	04	Handouts, chalk board, PPT, text book, charts, video film, Models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment						Maximum Marks	Resources Required			External / Internal			
1.	Theory exam	Student will be asked to describe any boiler.						10	Question paper + rating scale			External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>2</i>		<i>4</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain two phase system for steam, steam generators.													
LO Description		Identify components, mountings, accessories of a given boiler.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Demonstration of boiler components, mountings, accessories.	Interactive classroom teaching, lab demonstration, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments to make students practice their knowledge.			03	04	Handouts, chalk board, PPT, text book, charts, video film, models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal				
1.	Laboratory test by observation	Student will be asked to identify mountings and accessories of a steam boiler.					15	Observation schedule/check-list /rating scales /rubrics			External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of end practical exam															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>3</i>		<i>1</i>		4
COURSE NAME		General Mechanical Engineering													
CO Description		Explain internal combustion engines, air compressors.													
LO Description		Explain internal combustion engines.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process					Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Define heat engine, difference between internal combustion engines, external combustion engine, and classification of internal combustion engines. Construction and working of two strokes and four stroke petrol and diesel engine, indicated horse power, brake horse power, mechanical efficiency of an internal combustion engine.	Interactive classroom teaching, lab demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments to make students practice their knowledge.					05	02	Handouts, chalk board, PPT, text book, charts, video film, models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal				
1.	Theory exam	Student will be asked to describe construction, working of any internal combustion engine.					10	Question paper + rating scale			External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>3</i>		<i>2</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain internal combustion engines, air compressors.													
LO Description		Identify components of a given internal combustion engine.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process					Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Demonstration of internal combustion engine components.	Interactive classroom teaching, lab demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments to make students practice their knowledge.					03	04	Handouts, chalk board, PPT, text book, charts, video film, models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal				
1.	Laboratory test by observation	Student will be asked to identify components of an internal combustion engine.					15	Observation schedule/check-list /rating scales /rubrics			External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of end practical exam															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>3</i>		<i>3</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain internal combustion engines, air compressors.													
LO Description		Explain multistage reciprocating, rotary compressors.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.		LRs Required		Remarks		
1.	Air compressors its classification, construction and working of reciprocating air-compressor, rotary compressor, multistage reciprocating air compressor its merits and demerits, industrial uses of air-compressor.	Interactive classroom teaching, lab demonstration, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments to make students practice their knowledge.			07	02		Handouts, chalk board, PPT, text book, charts, video film, models.		NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required				External / Internal			
1.	Paper pen test	Student will be asked to describe construction, working, merits, demerits of any two air compressors.					10	Test paper + rating scale				Internal			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Part of Progressive – 2															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>4</i>		<i>1</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Select hydraulic pumps, turbines for a given situation.													
LO Description		Describe fluid properties and its measurement.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Definition of fluid properties, fluid pressure and its measurement, static pressure, intensity of pressure at a point in fluid at rest, pressure head, absolute and gauge pressure, simple and differential U tube manometers.	Interactive classroom teaching, tutorial, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.			04	NIL	Handouts, chalk board, PPT, text book, charts, video film, models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment						Maximum Marks	Resources Required			External / Internal			
1.	Quiz	Students will be asked to give a quiz on learning contents.						10	Rubrics/rating scales			Internal			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
Term work															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>4</i>		<i>2</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Select hydraulic pumps, turbines for a given situation.													
LO Description		Solve given problems using Pascal's law, continuity equation, Bernoulli's theorem.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Energies in fluid, pressure energy, kinetic energy, potential energy, total energy, Pascal's Law, continuity equation, Bernoulli's theorem, its assumption and application.	Interactive classroom teaching, tutorial, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.			06	NIL	Handouts, chalk board, PPT, text book, charts, video film, models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal				
1.	Theory exam	Student will be asked to solve two numerical problems on Pascal's law/continuity equation/ Bernoulli's theorem.					10	Question paper + rating scale			External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>4</i>		<i>3</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Select hydraulic pumps, turbines for a given situation.													
LO Description		Select hydraulic pumps, turbines for a given situation.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.		LRs Required		Remarks		
1.	Construction and working of hydraulic pumps- reciprocating and centrifugal pump. Construction and working of water turbines- impulse turbine and reaction turbine, factors affecting selection of hydraulic pumps, factors affecting selection of a water turbine.	Interactive classroom teaching, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments to make students practice their knowledge.			05	NIL		Handouts, chalk board, PPT, text book, charts, video film, models.		NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required				External / Internal			
1.	Theory exam	Student will be asked to describe construction and working of a hydraulic pump or water turbine and its selection criteria.					10	Question paper + rating scale				External			
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E 0 1</i>			<i>3 0 4</i>			<i>5</i>		<i>1</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain power transmission drives.													
LO Description		Describe power transmission, belt drive, gear drive.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks				
1.	Methods of power transmission, belt drive, open and cross belt drive, its application and advantages, velocity ratio of pulleys, compound belt drive, effect of slip in the belt drive. Gear drive, simple gear drive, compound gear drive, worm and worm wheel, bevel gear, velocity ratio in gear drive, its merits and demerits.	Interactive classroom teaching, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments to make students practice their knowledge.			07	NIL	Handouts, chalk board, PPT, text book, charts, video film, Models.			NIL				
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment				Maximum Marks	Resources Required			External / Internal					
1.	Theory exam	Student will be asked to classify, describe and compare power transmission drives.				10	Question paper + rating scale			External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code		LO Code		Format No.
					<i>E</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>0</i>	<i>4</i>	<i>5</i>		<i>2</i>		<i>4</i>
COURSE NAME		General Mechanical Engineering													
CO Description		Explain power transmission drives.													
LO Description		Solve a given numerical problem of belt drive, gear drive.													
SCHEME OF STUDY															
S. No.	Learning Content	Teaching –Learning Method			Description of T-L Process			Teach Hrs.	Pract. /Tut Hrs.	LRs Required			Remarks		
1.	Simple numerical problems on belt drive and gear drive.	Interactive classroom teaching, tutorial, quiz, assignments.			Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/tutorial/assignments to make students practice their knowledge.			08	NIL	Handouts, chalk board, PPT, text book, charts, video film, Models.			NIL		
SCHEME OF ASSESSMENT															
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required			External / Internal				
1.	Theory exam	Student will be asked to solve a numerical problem on belt drive and gear drive.					10	Question paper + rating scale			External				
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)															
NIL															

General Mechanical Engineering
LIST OF EXPERIMENTS

S.NO.	NAME OF THE EXPERIMENT	Hrs of Study
1	Mechanical Properties and Tests: -Perform tensile test of standard mild steel, CI specimen. -Perform hardness test Brinell, Rockwell. -Impact test Izod, Charpy on mild steel specimen.	14
2	Thermodynamics: -Demonstration of boilers. - Identify components mountings, accessories of boilers.	08
3	IC Engines and Air compressor: - Demonstration of construction, working of internal combustion engines.	08

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3		Sheet No. 1/3	
Branch	ALL BRANCHES			Semester		III	
Course Code	305	Course Name	PROFESSIONAL DEVELOPMENT-III				
Course Outcome 1		Student will be able to perform as the team leader of small team for solving a team problem in the given situation			Teach Hrs		Marks
Learning Outcome E0130511		Student will be able to demonstrate his/her understanding of leadership required in a team work performance			10		10
Contents		Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders					
Method of Assessment		Paper pen test					
Learning Outcome E0130512		Student will be able to play role of the leader of a team for solving a team problem in the given situation			10		15
Contents		Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders					
Method of Assessment		Student's role play					
Course Outcome 2		Student will be able to apply professional ethics in a given problem situation					
Learning Outcome E0130521		Student will be able to demonstrate his/her understanding of professional ethics			10		10
Contents		Professional ethics, its need and importance, seven ethics common to all professionals, general code of ethics for engineers, ethical issues for engineers, common problems related to professional ethics, ethical issues, identification of ethical issues in cases for engineers.					

Method of Assessment	Paper pen test		
Learning Outcome E0130522	Student will be able to apply appropriate professional ethics in a given problem situation	10	10
Contents	Procedure of solving the problems related professional ethics, Identification of ethical issue, identification of the ethical stand, searching various possible solutions for the problem keeping ethical stand in focus, selection of appropriate solution.		
Method of Assessment	Paper pen test		
Course Outcome 3	Student will be able to plan self-learning to complete the given task	Teach Hrs	Marks
Learning Outcome E0130531	Student will be able to identify the self-learning needs for completing the given task	10	10
Contents	Lifelong learning, its examples, self-directed learning, its examples, important steps in lifelong learning, identification of learning needs		
Method of Assessment	Assessment through student activity		
Learning Outcome E0130532	Student will be able to plan self directed learning for completing the given task	10	10
Contents	Need for planning, need for planning self directed learning, planning self directed learning, self directed learning plan, examples.		
Method of Assessment	Assessment through student activity		

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code			Course Code			CO Code	LO Code	Format No. 4
						E	0	1	3	0	5	1	1	
COURSE NAME	Professional Development-III													
CO Description	Student will be able to perform as the team leader of small team for solving a team problem in the given situation													
LO Description	Student will be able to demonstrate his/her understanding of leadership required in a team work performance													
SCHEME OF STUDY														
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1.	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students							
SCHEME OF ASSESSMENT														
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal									
1	Paper pen test	A test will be designed and administered by the teacher to assess the understanding of student. Assessment will be done through Rating Scale.	10	Test paper and Rating Scale	Internal									
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)														
Important qualities of team leader:- will be able to <ol style="list-style-type: none"> 1. to take initiatives 2. take responsibility on behalf of group 3. to visualize the team event and plan things for the event 4. to take interest to carry out related activities 														

5. to take interest in solving team related problems

The test questions :-

1. Explain the importance of team leadership
2. Explain important qualities of good team-leaders
3. Identify the team leader's behavior in the following list of team persons' behavior
4. Identify the team leader in the following case of team event
5. Suggest the team leader's would be course of action in the following team problem situation

Performance indicators

1. Quality of response the Q. 1
2. Quality of response to Q. 2
3. Number of correct behaviors identified in Q. 3(Max. 3 correct behaviors out of 10)
4. Correct team leader identified or not, in Q. 4
5. Correct team leader course of action suggested or not, in Q. 5

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					E	0	1	3	0	5	1	2	
COURSE NAME	Professional Development-III												
CO Description	Student will be able to perform as the leader of small team for solving a team problem in the given situation												
LO Description	Student will be able to play role of the leader of a team for solving a team problem in the given situation												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders	Case Study method	Teacher will organize a students' team event in class/ department. Few students will be asked to play roles of team members and the leader to solve team problems under given situation. Other students will observe. Afterward, teacher will discussion with students. Teacher will organize similar events for practice.	02	08	video film*	*Teacher will suggest a suitable online video to be viewed by students						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Student's role play	The teacher will organize small team events in batches in which individual students will be asked to play role of leader to solve a team problem, under given situation. Teacher will observe and assess the extent of leader's behavior performed by students on the basis of performance indicators	15	Rating Scale	Internal								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
The assessment will be done on basis of following performance indicators:- <ol style="list-style-type: none"> 1. Extent to which student take initiatives 2. Extent to which student take responsibility on behalf of group 3. Extent to which student visualize the team event and plan things for the event 4. Extent to which student take interest to carryout team related activities 													

5. Extent to which student take interest in solving team related problems

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					E	0	1	3	0	5	2	1	
COURSE NAME	Professional Development-III												
CO Description	Student will be able to apply professional ethics in a given problem situation												
LO Description	Student will be able to demonstrate his/her understanding of professional ethics												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Professional ethics, its need and importance, seven ethics common to all professionals, general code of ethics for engineers, ethical issues for engineers, common problems related to professional ethics, ethical issues, identification of ethical issues in cases for engineers.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Paper pen test	A test will be designed and administered by the teacher to assess the understanding of student. Assessment will be done through Rating Scale.	10	Test paper and Rating Scale			Internal						

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. Ethics common to all professions

- honesty
- trustworthiness
- loyalty
- respect for others
- adherence to the law
- doing good and avoiding harm to others
- Accountability.

2. General code of ethics for engineers:-

1. Respect for People's Dignity and Rights
2. Responsible Practice
3. Integrity in Relationships
4. Responsibility

3. Common Ethical issues for engineers:-

- Relationships with clients, consultants, competitors, and contractors
- Ensuring legal compliance by clients, client's contractors, and others
- Conflict of interest
- Bribery and kickbacks, which might include:
Gifts, meals, services, entertainment and recreation opportunities
- Treatment of confidential or proprietary information

- Consideration of the employer's assets
- Outside employment/activities

Test Performance Indicators:-

Extent to which student will be able

1. To explain the professional ethics (2 marks)
2. To explain the need and importance of professional ethics (2 marks)
3. To explain seven ethics common to all professions (2 marks)
4. To identify the problem related to professional ethics in given list of problems (2 marks)
5. To identify the ethical issue for an engineer in a given case of professional ethics (2 marks)

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code			Course Code			CO Code	LO Code	Format No. 4
						E	0	1	3	0	5	2	2	
COURSE NAME	Professional Development-III													
CO Description	Student will be able to apply professional ethics in a given problem situation													
LO Description	Student will be able to apply appropriate professional ethics in a given problem situation													
SCHEME OF STUDY														
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks							
1	Procedure of solving the problems related professional ethics, Identification of ethical issue, identification of the ethical stand, searching various possible solutions for the problem keeping ethical stand in focus, selection of appropriate solution.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students							
SCHEME OF ASSESSMENT														
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal							
1	Paper pen test	A case based test on problem of ethical issue for an engineer will be designed and administered by the teacher to assess the ability of students to solve the ethical problem; Assessment will be done through Rating Scale.	10	Test paper and Rating Scale			Internal							

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Steps in solving ethical problems:-

1. Identify the ethical issue in the problem
2. Identify the ethical stand in the problem
3. Search for various possible solutions keeping focus on the ethical stand
4. Implement the best possible solution

Performance indicators:-

1. Correctness of identified ethical issue in the problem (3 marks)
2. Correctness of identified ethical stand (3 marks)
3. Quality of suggested possible solutions (2 marks)
4. Appropriateness of selected best possible solution (2 marks)

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					E	0	1	3	0	5	3	1	
COURSE NAME	Professional Development-III												
CO Description	Student will be able to plan self-learning to complete the given task												
LO Description	Student will be able to identify the self-learning needs for completing the given task												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1.	Lifelong learning, its examples, self-directed learning, its examples, important steps in lifelong learning, identification of learning needs	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Assessment through student activity	A Self-assessment portfolio will be prepared by the student on the task assigned by the teacher. Assessment of portfolio will be done through Rating Scale.	10	Portfolio format and Rating Scale	Internal								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
<p>1. Lifelong learning</p> <p>All learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective. It is voluntary, self-initiated and self-directed learning.</p> <p>Examples:-</p>													

1. We learn to use smart phones (informal learning)
2. We learn yoga by joining a one week yoga training programme organized by a private spiritual institute (formal learning).

2. Self directed learning

A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.

3. Essential steps of lifelong learning

1. Identification of self learning need (what to learn)
2. Searching about how I can learn, search of learning resources and ways/means to use them for learning
3. Planning self-learning
4. Implementing the plan

4. Suggested list of tasks for practice of identification of learning needs

1. You have to repair your faulty house-hold electric iron
2. You have to daily operate the new washing machine purchased at your home
3. You have to format your PC
4. You have to attend online class using meet.google app
5. You have to share your ideas online with your distant friends. You have to arrange a webinar
6. You have to visit abroad and therefore you have to apply for passport
7. Your mother is a patient of high BP. You have to measure her BP daily two times at home with traditional BP measuring apparatus
8. Your bike is not getting started. You have to check its spark plug.
9. You have to complete bank paper formalities for bank loan to establish your small manufacturing unit
10. You have to prepare French-fries at home.

5. Self-assessment portfolio

A questionnaire in which questions are in first person and space is provided after each question to write the answer. It is prepared by the student.

6. Self-assessment portfolio questions:-

1. Can I complete this task ?
2. Is there special knowledge or skill required to complete the task ?

3. What knowledge or skill is required to complete this task ?
4. Do I have this knowledge or skill ?
5. From where I can learn this knowledge or skill. (Mention at least three sources. Sources may be people, institutions, books, websites?)
6. How I can manage to learn this knowledge or skill?

7. Indicators of performance

1. Able to identified that he/she can-not complete the given task due to lack of knowledge or skill
2. Able to identified the need for special knowledge or skill to complete the task
3. Correctness of identified knowledge or skill required to complete the task
4. Appropriateness of sources from which student can learn knowledge or skill
5. Extent of feasibility of student's way to acquire the required knowledge or skill

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. 4
					E	0	1	3	0	5	3	2	
COURSE NAME	Professional Development-III												
CO Description	Student will be able to plan self directed learning to complete the given task												
LO Description	Student will be able to plan self directed learning for completing the given task												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1.	Need for planning, need for planning self directed learning, planning self directed learning, self directed learning plan, examples.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment of preparing self-directed learning plan for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required			External / Internal						
1	Assessment through student activity	A self directed learning plan will be prepared by the student on the task assigned by the teacher. Assessment of the plan will be done through Rating Scale.	10	Plan format and Rating Scale			Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													
<p>1. Self directed learning</p> <p>A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.</p> <p>3. Essential steps of lifelong learning</p> <p>5. Identification of self learning need (what to learn)</p>													

6. Searching about how I can learn, search of learning resources and ways/means to use them for learning
7. Planning self directed learning
8. Implementing the plan

4. Contents of the plan

1. Description of knowledge or skill to be self-learned
2. Description of selected source of learning the knowledge or skill ie people, books, institutions, websites etc.
3. Description of method of self-directed learning viz formal learning or informal learning
4. Description of additional resources / learning resources required
5. Expected time required to learn along with justification

5. Indicators of performance

1. Quality of description of knowledge or skill to be self-learned (3 marks)
2. Appropriateness of selected source of knowledge or skill learning (3 marks)
3. Appropriateness of method of self-learning (1 mark)
4. Appropriateness of additional resources / learning resources required (1 mark)
5. Appropriateness of time required to learn (1 mark)