RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code		Course Code		CO Code	LO Code	Format No. **4**
		O	0	1	4	0	4	1	1	

COURSE NAME	**Analog Integrated Circuit**
CO Description	Describethe construction of operational amplifiers.
LO Description	Construct Op-Amp using basic amplifier circuits.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-01	Four stage Block diagram of an Operational Amplifier(Op-Amp), equivalent circuit of a typical Op-Amp (4 stages), differential andcommonmodeofoperation, concept ofinverting andnon-invertinginput, schematic symbol and equivalent circuit of Op-Amp, Ideal Characteristics	Interactive classroom lecture, PPT, demonstration, quiz, assignments	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/ assignments/ tutorial.	8	--	Text Books, PPT, Handouts, chalk board, charts.Videos lectures- NPTEL& others	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-01	Mid Semester Theory Exam	**Student will be asked to**(and/or): 1. List out and explain 4 stages of an Op-Amp. 2. Draw various equivalent circuit and/or symbol of Op-Amp. 3. Explain different mode of operation. 4. Describe various concept and op-amp characteristics.	10	Question paper, Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		O	*0*	*1*	*4*	*0*	*4*	*1*	*2*	

COURSE NAME	Analog Integrated Circuit
CO Description	Describethe construction of operational amplifiers.
LO Description	Explain basic Op-Amp circuit parameters.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-02	IC Packages of Op-Amps, Basic Parameters of Op-Amp: Inputoffsetvoltage, Input resistance, Common Mode Rejection Ratio (CMRR), Slew rate, Gain, Bandwidth, Op-Amp 741IC characteristics,pinoutandpowersupplyrequirements	Interactive classroom lecture, PPT, demonstration, quiz,assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct quiz/assignments/ tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Numerical Problems Workbook	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-02	End Semester Theory Exam	**Student will be asked to**(and/or): 1. List the various packages of Op-Amp. 2. Explain the given parameter of Op-Amp. 3. Simple numerical on Op-amp parameter calculation.	10	Question paper, Rating scale	External

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code		Course Code			CO Code	LO Code	Format No. **4**
		0	*0*	*1*	*4*	*0*	*4*	*1*	*3*

COURSE NAME	Analog Integrated Circuit
CO Description	Describethe construction of operational amplifiers.
LO Description	Measure basic characteristics of Op-Amps.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-03	MeasurementofDifferentcharacteristicsofanOp-Amp viz. Output Resistance, Input Resistance, Voltage Gain, gain-bandwidth product. (On Trainer-Kit and/or Simulation)	Lab demonstration, hands on practice, lab assignments, V-Lab.	• Teacher with support from lab staff will demonstrate the procedure of lab experiments. • Student will conduct lab assignment based on these experiments.	--	8	Lab manual, charts, experimental trainer instruments/kit with measuring instruments, computer with relevant simulation software and high speed internet.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

| LO-03 | Practical test in laboratory | **Student will be asked to**
1. Verify and measure different characteristic of Op-Amp. | 10 | Rubrics/Rating scale | External |

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	**Branch Code**		**Course Code**			**CO Code**	**LO Code**	Format No. **4**
		O	0	1	4	0	4	2	4

COURSE NAME	**Analog Integrated Circuit**
CO Description	Classify different Op-Amps based circuits.
LO Description	Construct general Op-Amp based circuits.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-04	**Different Circuits of Op-Amps** Circuit diagram, working concept and formula derivation of: Inverting amplifier, non-invertingamplifier, Voltage follower, Adder and Subtractor, Differentiator, Integrator, LogarithmicamplifierandAntilogarithmicamplifier	Interactive classroom lecture, PPT, demonstration, quiz,assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture-NPTEL and others.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

| LO-04 | End Semester Theory Exam | **Student will be asked to**(and/or):
1. Draw circuit diagram and explain working of any given op-amp based circuit.
2. Derive the expression for any given op-amp based circuit. | 10 | Question paper, Rating scale | External |

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code		Course Code			CO Code	LO Code	Format No. **4**
		0	0	1	4	0	4	2	5

COURSE NAME	**Analog Integrated Circuit**
CO Description	Classify different Op-Amps based circuits.
LO Description	Describe general Op-Amp based filter circuits.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-05	Op-Amp based circuit diagram, working concept and frequency response of: Active filters such aslowpass, highpass, band pass, band reject and all pass filter. Simple numerical problems on Op-amp based filter design.	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture-NPTEL and others.	

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<tr>
<td>**S. No.**</td>
<td>**Method of Assessment**</td>
<td>**Description of Assessment**</td>
<td>**Maximu m Marks**</td>
<td>**Resources Required**</td>
<td>**External / Internal**</td>
</tr>
<tr>
<td>LO-05</td>
<td>End Semester Theory Exam</td>
<td>**Student will be asked to**(and/or):
1. Explain working of given op-amp based filter with circuit diagram.
2. Draw frequency response of given filter circuit.
3. Calculate cut-off frequencies for any given filter circuit.</td>
<td>10</td>
<td>Question paper + Rating scale.</td>
<td>Internal</td>
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colspan	**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code	Course Code	CO Code	LO Code	Format No. **4**
		O 0	1 4 0 4	2	6	

COURSE NAME	**Analog Integrated Circuit**
CO Description	Classify different Op-Amps based circuits.
LO Description	Verify different Op-Amps based circuits.

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<tr><td colspan="7" align="center">**SCHEME OF STUDY**</td></tr>
<tr>
<td>**S. No.**</td>
<td>**Learning Content**</td>
<td>**Teaching – Learning Method**</td>
<td>**Description of T-L Process**</td>
<td>**Teach Hrs.**</td>
<td>**Pract. /Tut Hrs.**</td>
<td>**LRs Required**</td>
<td>**Remarks**</td>
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<tr>
<td>LO-06</td>
<td>AC/DC analysis of inverting and non-inverting amplifier, verification of voltage follower, adder, differentiator, and logarithmicamplifier, Verification of Op-amp low pass filter (On Trainer-Kit</td>
<td>Lab demonstration, PPT , hands on practice, lab assignments.</td>
<td>• Teacher with support from lab staff will demonstrate the procedure of lab experiments.
• Student will conduct lab assignment based on these experiments.</td>
<td>--</td>
<td>8</td>
<td>Lab manual, charts, Handouts, experimental trainer instruments/kit with measuring instruments, computer with relevant simulation software and high</td>
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					speed internet.	

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SCHEME OF ASSESSMENT

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S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-06	Practical test in laboratory	**Student will be asked to** 1. Simulate and verify the given op-amp based circuit.	10	Rubrics, Rating scale	Internal

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ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

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RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code		Course Code		CO Code	LO Code	Format No. **4**
		O	0	1 4	0 4	3	7	

COURSE NAME	Analog Integrated Circuit
CO Description	ConstructOp-Amp based circuit for differentapplications.
LO Description	Devlop Op-Amp based comparator and Schmitt trigger circuits.

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SCHEME OF STUDY

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S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Tea ch Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks

| LO-07 | Comparators:Functionsof acomparator, inverting and non-inverting operation ofcomparator, Open loop-zero crossingdetector Schmitttrigger: Inverting andnon-inverting with circuit diagram, input and output waveforms and threshold levels, hysteresisvoltage curve | Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments. | Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge. | 8 | -- | Text Books, PPT, Handouts, chalk board, charts, Video lecture- NPTEL and others. | |

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
Lo-07	Mid Semester Theory Exam	**Student will be asked to**(and/or): 1. Explain operation of inverting and non-inverting comparator. 2. Describe open loop zero crossing detector. 3. Explain Schmitt trigger with circuit diagram and i/p & o/p waveform. 4. Derivethreshold levels of Schmitt trigger and simple numerical on it.	10	Question paper , Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code		Course Code		CO Code	LO Code	Format No. **4**
		O	*0*	*1*	*4*	*0*	*4*	*3*	*8*	

COURSE NAME	**Analog Integrated Circuit**
CO Description	ConstructOp-Amp based circuit for differentapplications..
LO Description	Explain Op-Amp based S&H circuits, rectifiers and function generators.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks

		Method					
LO-08	Sample andHold circuit, Half Wave PrecisionRectifier, Op-Amp based WeinBridgeOscillator, PhaseshiftOscillator, Square Wave Generator, Triangular Wave Generator	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture-NPTEL and others.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-08	End Semester Theory Exam	**Student will be asked to** (and/or): 1. What is sample and hold circuitand its need. 2. Explain given op-amp based oscillator with circuit diagram. 3. Compare different oscillator and rectifier circuit.	10	Question paper , Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code		Course Code		CO Code	LO Code	Format No. **4**
		O	*0*	*1*	*4*	*0*	*4* 3 9	

COURSE NAME	**Analog Integrated Circuit**
CO Description	ConstructOp-Amp based circuit for differentapplications.
LO Description	Verify different applications of Op-Amp based circuits.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks

| LO-09 | Verification of comparator, Schmitt trigger, Phase Shift Oscillator and triangular wave generator using Op-Amp, (On Trainer-Kit and/or Simulation software) | Lab demonstration, PPT , hands on practice, lab assignments. | • Teacher with support from lab staff will demonstrate the procedure of lab experiments.
• Student will conduct lab assignment based on these experiments. | -- | 8 | Lab manual, charts, Handouts, experimental trainer instruments /kit with measuring instruments, computer with relevant simulation software and high speed internet. | |

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-09	Practical test in laboratory	**Student will be asked to** 1. Design and verify given op-amp based comparator, oscillator & Schmitt trigger circuits.	10	Rubrics, Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code		Course Code			CO Code	LO Code	Format No. **4**
		O	*0*	*1*	*4*	*0*	*4*	*4*	*10*	

COURSE NAME	**Analog Integrated Circuit**
CO Description	Compare voltage regulators and converters
LO Description	Classify different voltage regulator ICs.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –	Description of T-L	Teach	Pract.	LRs Required	Remarks

		Learning Method	Process	Hrs.	/Tut Hrs.		
LO-10	Voltage regulators: Fixed voltage regulator-78XX and 79XX series ICs with typical connection diagram and working. Adjustable voltage regulator – using LM317 IC with typical connection diagram and working Simple numerical problems on fixed and adjustable voltage regulators.	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture-NPTEL and others.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-10	End Semester Theory Exam	**Student will be asked to** (and/or): 1. List out fixed voltage regulator ICs with typical connection and working. 2. Explain working of adjustable voltage regulator with circuit diagram. 3. Solve simple numerical problemson fixed and adjustable voltage regulator.	10	Question paper, Rating scale.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

			Branch Code		Course Code		CO Code	LO Code	
RGPV (Diploma Wing) Bhopal		**SCHEME FOR LEARNING OUTCOME**	O	O	1	4	O	4	4	11	Format No. **4**

COURSE NAME	**Analog Integrated Circuit**
CO Description	Compare voltage regulators and converters
LO Description	Describe operation of various converter ICs.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-11	Converters: Voltage to current converter with floating load and its application in low voltage DC and AC voltmeter. Voltage to current converter with grounded load. Current to voltage converter and its application in digital to analog converter using IC 1408. Digital to Analog Conversion using binary weighted registers, R2R registers using Op-Amp IC 351. Analog to digital conversion using successive approximation using Op-Amp as comparator.	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture- NPTEL and others.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-11	Mid Semester Theory Exam	**Student will be asked to**(and/or): 1. Explain voltage to current converter with different loads and application. 2. Draw and explain current to voltage converter andits application in DAC. 3. Explain different types of ADC & DAC using op-amp.	10	Question paper , Rating scale.	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code		CO Code	LO Code	Format No. **4**
		O	0	1	4	0	4	4	12	

COURSE NAME	**Analog Integrated Circuit**
CO Description	Compare voltage regulators and converters
LO Description	Verify the working of voltage regulator& converter ICs.

SCHEME OF STUDY							
S. No.	**Learning Content**	**Teaching – Learning Method**	**Description of T-L Process**	**Teach Hrs.**	**Pract. /Tut Hrs.**	**LRs Required**	**Remarks**
LO-12	Verification of 78XX, 79XX, Voltage to current and current to voltage converter using Op-Amp ICs (On Trainer-Kit and/or Simulation)	Lab demonstration, PPT , hands on practice, lab assignments.	• Teacher with support from lab staff will demonstrate the procedure of lab experiments. • Student will conduct lab assignment based on these experiments.	--	8	Lab manual, charts, Handouts, experimental trainer instruments/kit with measuring instruments, computer with relevant simulation software and high speed internet.	

SCHEME OF ASSESSMENT				
S. No.	**Method of Assessment**	**Description of Assessment**	**Maximum Marks**	**Resources Required**	**External / Internal**
LO-12	Practical test in laboratory	**Student will be asked to** 1. Design and verify voltage regulator for given ICs. 2. Verify voltage to current and current to voltage converter circuit using Op-Amp ICs.	10	Rubrics, Rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code		CO Code	LO Code	Format No. **4**
		O	*0*	*1*	*4*	*0*	*4* *5*	*13*	

COURSE NAME	Analog Integrated Circuit
CO Description	Illustrate 555 timer and PLL ICs for various applications.
LO Description	Construct multi-vibrator circuits using 555 timer IC.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-13	Functional block diagram of a 555 timer IC, Pin configuration of 555 IC, Multi-vibrator using 555 IC: mono-stable, bi-stable and astable, 555 IC as wave generators: Square wavegenerators, Saw tooth wave generatorsand Tri-angular wavegenerators.	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture-NPTEL and others.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-13	Mid Semester Theory Exam	**Student will be asked to**(and/or): 1. Draw pin and block diagram of timer 555 ICs. 2. Explain different operation modes of 555 ICs. 3. Construct given waveform generator using 555 ICs.	10	Question paper , Rating scale.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code		CO Code	LO Code	Format No. **4**
		O	*0*	*1*	*4*	*0*	*4*	*5* *14*	

COURSE NAME	**Analog Integrated Circuit**
CO Description	Illustrate 555 timer and PLL ICs for various applications.
LO Description	Explain working and applications ofPhase Lock Loop(PLL) IC.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-14	Phase Lock Loop (PLL) 565 IC: functional block diagram with working principle, Lock & Capture range, transfer characteristics Applications of PLL – FM demodulation and frequency multiplier	Interactive classroom lecture, PPT, Video, demonstration, quiz, assignments.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	8	--	Text Books, PPT, Handouts, chalk board, charts, Video lecture-NPTEL and others.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
LO-14	End Semester Theory Exam	**Student will be asked to** (and/or): 1. Explain working principle of PLL. 2. Define capture and lock range of PLL. 3. List out application of PLL and explain it.	10	Question paper , Rating scale.	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code		CO Code	LO Code	Format No. 4
		O	0	1	4	0	4 5	15	

COURSE NAME	Analog Integrated Circuit
CO Description	Illustrate 555 timer and PLL ICs for various applications.
LO Description	Assemble and verify 555-timer and PLL based circuits.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
LO-15	Astable multivibrator & Sawtooth waveform generator using 555 IC. PLL565 IC as a frequency multiplier. (On Trainer-Kit and/or Simulation Software)	Lab demonstration, PPT , hands on practice, labassignments.	• Teacher with support from lab staff will demonstrate the procedure of lab experiments. • Student will conduct lab assignment based on these experiments.	--	8	Lab manual, charts, Handouts, experimental trainer instruments/kit with measuring instruments, computer with relevant simulation software and high speed internet.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximu m Marks	Resources Required	External / Internal

LO-15	Practical test in laboratory	**Student will be asked to** 1. Assemble circuit of astable multi-vibrator and verify output using 555 ICs. 2. Simulate circuit of saw-tooth waveform generator and verify output using 555 ICs. 3. Verify application of PLL ICs as frequency multiplier.	10	Rubrics, Rating scale	Internal
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					