Gondwana University, Gadchiroli

Proposed Syllabus

B.Sc. II

Subject: Electronics

Semester-III & IV

Board of Studies - Electronics

Gondwana University Gadchiroli

Scheme of Bachelor of Science for Semester Examination

Subject: Electronics

Class	Semester	Theory Paper	Teaching Scheme Per Week			Examination Scheme					
			Theory	Total Periods	Practical	Theory Marks				Practical Marks	Total Marks
						Theory Paper	Internal Assessment				
							Paper - I	Paper - II	Total		
B. Sc. I	I	I	3	6 + 1T*	6	50	10	10	20	30	150
		II	3			50					
	II	I	3	6 + 1T*	6	50	10	10	20	30	150
		II	3			50					
B. Sc. II	III	I	3	6 + 2T*	6	50	10	10	20	30	150
		II	3			50					
	IV	I	3	6 + 2T*	6	50	10	10	20	30	150
		II	3			50					
B. Sc. III	V	I	3	6 + 2T*	6	50	10	10	20	30	150
		II	3			50					
	VI	I	3	6 + 2T*	6	50	10	10	20	30	150
		II	3			50					

* Periods for Tutorials per batch.

Pattern of Question Papers (UG)

Time : 3 Hours

Maximum marks : 50

Question No.	**Marks Allotted**
Qu. 1 Either	
From Unit - I	10
Or	
From Unit - I	10
Qu. 2 Either	
From Unit - II	10
Or	
From Unit - II	10
Qu. 3 Either	
From Unit - III	10
Or	
From Unit - III	10
Qu. 4 Either	
From Unit - IV	10
Or	
From Unit - IV	10
Qu. 5	
a) From Unit - I	2.5
b) From Unit - II	2.5
c) From Unit - III	2.5
d) From Unit - IV	2.5

The above pattern is for both papers of each semester of B.Sc. II, w.e.f. 2013-14.

Details of the Syllabus

Second Year B.Sc.

Subject: Electronics

Scheme for Semester-III

W.E.F. 2013-14

Paper	No. of Periods per week (48 minutes each)			Marks					
	Lecture	Practical	Tutorial	Theory	Internal Assessment			Practical	Total
					P-1	P-2	T		
Paper – I: Amplifiers	3	6	2	50	10	10	20	30	150
Paper – II: Digital Electronics - I	3			50					

(Semester-III)

Paper-I

Amplifiers

Unit – I

Introduction to amplifier, Basic notations and Parameters, Transistor as an Amplifier. DC bias and its Stabilization (Emitter bias, base resistor and potential divider). Thermal runway, Hybrid equivalent circuit for CE amplifier, Analysis of single stage CE Transistor Amplifier using h-parameters. (Simple numerical are expected)

Unit - II

Introduction to Class A, Class B, Class C and Class AB amplifiers. Cascaded Amplifier: direct coupled, transformer coupled and RC coupled.

RC Coupled Amplifier, derivation of voltage gain in mid, low and high frequency range using h-parameters. Introduction to Distortions in Amplifier. (Simple numerical are expected)

Unit- III

Introduction to DC Coupled Amplifier, Difference Amplifier, Need of Two Power Supplies, Working of Difference Amplifier, Differential Mode Gain, Common Mode Gain, CMRR, IC Op-Amp (block diagram), Parameter of Op-Amp, Characteristics of Ideal Op-Amp.

Unit- IV

Op-Amp as an Inverting Amplifier, Virtual ground, Non-Inverting Amplifier, Unity Gain Amplifier, Adder, Subtractor, Integrator, Differentiator (derivation for equation of output for each application.) Op-Amp a Switching Circuit, Comparator, Zero crossing detector and Schmitt trigger.(simple numerical are expected).

(Semester-III)
Paper-II
Digital Electronics-I

Unit- I

Karnaugh Map, Terms Related to K-map for 2,3 and 4 variables K-Maps, Simplification of SOP and POS Logic Expression using K-Map, (simple numaricle on simplification of K-maps are expected).

Multiplexer : Concept, 2:1 MUX, 4:1 MUX using Logic Gates and Design of 8:1 MUX using 4:1 MUX.

DeMultiplexer : Concept, 1:2 DEMUX, 1:4 DEMUX using Logic Gates and Design of 1:8 DEMUX using 1:4 DEMUX.

Unit- II

Decoder: Concept, 2 line to 4 lines Decoder, 1 0f 10 Decoder using Logic Gates, BCD to Seven Segment Decoder/Driver (Common Anode [IC-7447], Common Cathode Type [IC-7448]).

Encoder: Concept, Decimal to BCD Encoder, Priority Encoder using IC 74147.

Half Adder, Full Adder, 4-Bit Binary Adder(IC-7483), 2's Compliment Adder/Subtractor.

Unit- III

Concept of Flip Flop, R-S Flip Flop, Clocked R-S Flip Flop, Limitations of R-S FF, D- FF, Concepts of Edge and Level Triggering, Propagation Delay, set up time, hold time, T FF, JK FF, preset and clear inputs, Race around Condition, JKMS FF (Explanation of all flip flops with truth tables and timing diagrams).

Unit- IV

Concept of counters – Types: Asynchronous (4-bit ripple counter), Synchronous, Asynchronous down counter, Up/Down counter. Modulus of a Counter, Modified Counter, Decade counter, Ring Counter, Johnson Counters (Truth tables and timing diagrams are expected).

Internal Assessment (20 marks)

	Marks		
	P-1(10)	P-2(10)	T (20)
Attendance	03	03	06
Home assignment	04	04	08
Seminar/ Industrial Visit	03	03	06

PRACTICALS (conducted by internal examiner)

It is divided into two sections i.e. Section-A and Section-B. At least five experiments from each section must be performed and the practical record book duly signed should be submitted at the time of examination. Each student is expected to perform one experiment from each section, in the University Examination. The duration of practical examination is six hours.

Marks Distribution:

	Record	Experiment	Viva	Total
Section – A	3	9	3	15
Section – B	3	9	3	15
			Total	30

Section A

1. Study of common Emitter amplifier.
2. Study of RC coupled amplifier.
3. Study of IC 741 Op-Amp block diagram, Pin configuration, Power supply, off set setting.
4. Study of Op-Amp as Inverting Amplifier and Sign changer.
5. Study of Op-Amp as Non-Inverting Amplifier and Unity Gain Amplifier.
6. Study of Op-Amp as an Adder.
7. Study of Op-Amp as a subtractor.
8. Study of Op-Amp as an Integrator.
9. Study of Op-Amp as a Differentiator.
10. Study of Op-Amp as an Comparator
11. Study of Op-Amp Schmitt trigger.

Section B

1. Study of RSFF, Clocked RSFF and DFF using NAND/NOR gates.
2. Study of JKFF using NAND/NOR gates.
3. Study of JKMS Flip-flop using IC 7476/NAND gates.
4. Study of Up Counter using IC 7476.
5. Study of Down Counter using IC 7476.
6. Study of IC 7490 (for different modulus counter).
7. Study of IC 7493 (for different modulus counter).
8. Study of Ring Counter using IC 7476.
9. Study of Johnson Counter using IC 7476.
10. Study 2-line to 4-line decoder using basic gates.
11. Study of IC 7447 Seven Segment Decoder Driver.
12. Study of 4:1 MUX and Construction of 8:1 MUX using 4:1 MUX.
13. Study of 1:4 DEMUX and 1:8 DEMUX.
14. Study of 2's compliment adder/subtractor.

Note: An Industrial visit / Study tour should be arranged during the academic year.

Reference Books:

1. Elements of Electronics by, Singh, Bagade
2. Principle of Electronics by, V. K. Mehta
3. Modern Digital Electronics by, R. P. Jain.
4. Digital and Analogue Techniques by, Navneeth, Kale and Gokhale.
5. Electronics Devices and Circuit by, Allen Mottershed
6. Monograph Circuit Design by, Goyal and Khetan.
7. Basic electronics – B.L. Thareja
8. Electronics, fundamental and Application – Ryder
9. Electronics, Discrete and integrated Circuits – Y.M.Bapat
10. Basic electronics Linear Circuits – R.N.Bhargawa
11. Principle Electronics - Malvino
12. Digital Principle and application – Malvino & Leach
13. Electronics devices & circuits –Jacob Milliman & C.C. Hulkiyas
14. Integrated circuits –Jocob Milliman & C.C. Hulkiyas