| USN | | | | | | | | | | Course Code | 2 | 1 | E | L | N | 1 | 4 |

First Semester B.E. Degree Examinations, May 2022
ELECTRONICS & COMMUNICATION - FUNDAMENTALS AND APPLICATIONS
(Common to all Branches)

Duration: 3 hrs   **Max. Marks: 100**

*Note: 1. Answer any **FIVE** full questions, choosing **ONE** full question from each module.*
*   2. Missing data, if any, may be suitably assumed*

_Q. No_		_Question_	_Marks_	_(RBTL:CO:PI)_
		MODULE – 1		
1.	**a.**	List the advantages of negative feedback in amplifiers circuits. With relevant equations and diagram explain the concept of negative feedback.	**08**	(2 :1 : 1.3.1)
	b.	Discuss the working principle of a single stage astable oscillator using an op-amp.	**06**	(2 :1 : 1.3.1)
	c.	List and describe the main types of amplifiers.	**06**	(1 :1 : 1.3.1)
		(OR)		
2.	**a.**	Explain the operation of a simple shunt zener voltage regulator.	**07**	(2 :1 : 1.3.1)
	b.	With circuit diagram explain the voltage doubler and voltage tripler.	**07**	(1 :1 : 1.3.1)
	c.	Write a note on frequency response characteristics of an amplifier circuit, clearly mentioning the half power frequencies.	**06**	(2 :1 : 1.3.1)
		MODULE - 2		
3.	**a.**	Explain the full adder using logic gates with the help of truth table.	**07**	(2 :2 : 1.4.1)
	b.	With a neat block diagram show how typical input and output blocks are connected to a microcontroller unit.	**06**	(1 :2 : 1.3.1)
	c.	With the help of a neat diagram explain the 4-bit shift register operation and types.	**07**	(2 :2 : 1.3.1)
		(OR)		
4.	**a.**	Draw a 4-stage shift register using J-K flip flop.	**07**	(2 :2 : 1.4.1)
	b.	Construct a logic circuit that will produce a Logic 1 output whenever two or more of its inputs are at Logic 1.	**07**	(2 :2 : 1.3.1)
	c.	Write a note on different data types mentioning the bit size and range of values supported.	**06**	(1 :2 : 1.3.1)
		MODULE-3		
5.	**a.**	Compare Embedded systems and general computing systems. Also, provide major application areas of embedded systems.	**06**	(1 :3 : 1.3.1)
	b.	Bring out the main features of UART and USB.	**07**	(2 :3 : 1.3.1)
	c.	Explain the different configurations of the 7-segment LED display.	**07**	(1 :3 : 1.3.1)
		(OR)		
6.	**a.**	Bring out the differences between RISC and CISC, Harvard & Von-Neumann.	**06**	(2 :3 : 1.3.1)
	b.	With relevant diagrams explain the operation of relay, push button and Piezo-buzzer.	**07**	(1 :3 : 1.3.1)
	c.	Explain the external communication interfaces USB and Wi-Fi.	**07**	(1 :3 : 1.3.1)

Note: (**RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI - Performance Indicator**)

MODULE-4

7.	**a.**	Define and explain SNR, noise figure, channel types, amplitude modulation.	**06**	(2 :4 : 1.3.1)
	b.	Explain the following with the help of waveforms: (i) PAM (ii) PWM (iii) PPM (iv) PCM	**07**	(2 :4 : 1.3.1)
	c.	Discuss the various multiple access techniques used in cellular networks.	**07**	(1 :4 : 1.3.1)

(OR)

8.	**a.**	Describe the classification of radio frequency spectrum with applications in communication systems.	**07**	(2 :4 : 1.3.1)
	b.	Define the terms: multipath, constructive and destructive interference, coherence time, coherence bandwidth, delay spread.	**07**	(1 :4 : 1.3.1)
	c.	Define an antenna and discuss different types of antennas.	**06**	(2 :4 : 1.3.1)

MODULE-5

9.	**a.**	Draw the schematic diagram of a cellular telephone system and define its basic components.	**06**	(2 :5 : 1.3.1)
	b.	Discuss 3G technology with specific emphasis on CDMA.	**07**	(2 :5 : 1.3.1)
	c.	Explain the optical fiber communication system with a block diagram.	**07**	(2 :5 : 1.3.1)

(OR)

10.	**a.**	Based on orbits, discuss the different types of satellites.	**10**	(2 :5 : 1.3.1)
	b.	With the help of architecture explain the evolution from GSM to LTE.	**10**	(2 :5 : 1.3.1)

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Note: (**RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI - Performance Indicator**)