

# BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN

Course Code **2 1 E L N 1 4 / 2 4**

First/Second Semester B.E. Degree Examinations, September/October 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

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<b>MODULE - 1</b>			
1.	a. List and describe the main types of amplifiers.	10	(1 : 1 : 1.3.1)
	b. Explain the operation of PN junction diode under forward and reverse bias conditions with the help of V-I characteristics curve.	10	(2 : 1 : 1.3.1)
<b>(OR)</b>			
2.	a. With neat block diagram explain the working of a DC power supply. Also mention the principal components used in each block.	10	(2 : 1 : 1.3.1)
	b. List the ideal characteristics of Operational amplifier and sketch any two applications of Op-Amp.	10	(1 : 1 : 1.3.1)
<b>MODULE - 2</b>			
3.	a. Draw 3:8 decoder circuit and show its implementation using basic gates with help of logic circuit and truth table.	07	(2 : 2 : 1.4.1)
	b. Compare combinational logic circuit and sequential logic circuit with necessary illustrations and examples.	06	(2 : 2 : 1.3.1)
	c. Explain the operation of SR Flip-Flop with logic diagram and truth table considering for all output states. And also mention how to avoid undetermined state of SR flip flop when S=1 and R=1.	07	(2 : 2 : 1.4.1)
<b>(OR)</b>			
4.	a. Define multiplexer and construct 4:1 multiplexer using basic gates.	08	(2 : 2 : 1.4.1)
	b. Construct the truth table for the logic gate arrangement as shown in fig. Q.4(b), mentioning its logical output expressions at point C, D and final output point Y.	06	(2 : 2 : 1.3.1)

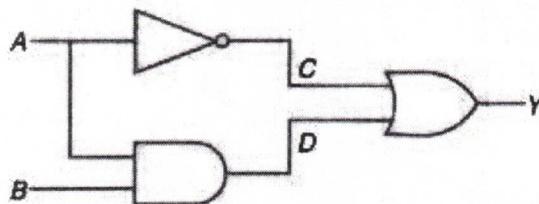


Fig.Q 4(b)

And Justify whether it is an example of combinational or sequential logic circuit?

c.	Write a note on different data types mentioning the bit size and range of values supported.	06	(2 : 2 : 1.3.1)
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**MODULE-3**

5. a. Discuss the following communication interface protocols relevance to automotive applications: i) I<sup>2</sup>C ii) CAN **10** (1 :3 : 1.3.1)  
b. Bring out the main differences between RISC and CISC, Harvard and Von-Neumann architecture. **10** (2 :3 : 1.3.1)

**(OR)**

6. a. With neat block diagrams illustrate the working principle of an instrumentation system and a control system. **08** (2 :3 : 1.3.1)  
b. State the differences between microcontroller and microprocessor. **05** (1 :3 : 1.3.1)  
c. Define transducer and tabulate the classification of transducers with examples. **07** (1 :3 : 1.3.1)

**MODULE-4**

7. a. Explain about sampling, quantization and encoding. **07** (2 :4 : 1.3.1)  
b. Describe the various blocks of the basic communication system with neat diagram. **08** (2 :4 : 1.3.1)  
c. Define antenna and discuss different types of antennas. **05** (1 :4 : 1.3.1)

**(OR)**

8. a. Explain different types of radio wave propagation with relevant sketches. **07** (2 :4 : 1.3.1)  
b. Write a short note on PAM. **05** (1 :4 : 1.3.1)  
c. Define modulation and explain the following digital modulation schemes with the help of waveforms. **08** (2 :4 : 1.4.1)  
(i) ASK (ii) FSK (iii) PSK

**MODULE-5**

9. a. With a neat block diagram illustrate the generalized configuration of a fiber optic communication system. **10** (2 :5 : 1.3.1)  
b. Outline the highlights of evolution of mobile wireless technologies start from 1G to 4G. **10** (1 :5 : 1.3.1)

**(OR)**

10. a. Discuss briefly the role of the following terms with respect to GSM system: mobile station, base station subsystem, and network & switching system. **06** (2 :5 : 1.3.1)  
b. Define the terms cell and cluster in a cellular system and briefly explain the cellular concept in wireless mobile networks. **07** (1 :5 : 1.3.1)  
c. Briefly explain the general satellite communication system with a neat block diagram, highlighting the basic elements of it. **07** (2 :5 : 1.3.1)

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