Semester: I / II	FIRST YEAR	AY: 2026-27
Course Code: 1BESC104C	Course Name: Introduction to Electronics and Communication	

Question Bank

Q.	Module-01	M	L	C
1.	With a neat block diagram, explain the working of a regulated DC power supply, clearly describing the function of each stage.	10	L2	CO1
2.	With a neat circuit diagram, explain the working of a full-wave bridge rectifier.	6	L2	CO1
3.	With circuit diagram and waveforms, explain the working of a bi-phase (centre-tapped) full-wave rectifier.	8	L2	CO1
4.	Describe the operation of a Switched Mode Power Supply (SMPS) with a neat diagram.	6	L2	CO1
5.	Draw the circuit of a Zener diode voltage regulator and explain its working.	6	L2	CO1
6.	Draw the circuit of a voltage doubler and explain its working.	6	L2	CO1
7.	What is an amplifier? Explain the types of amplifiers.	6	L2	CO1
8.	Define input resistance, output resistance, phase shift and frequency response of an amplifier.	6	L1	CO1
9.	Explain the frequency response of an amplifier with a neat sketch.	6	L2	CO1
10.	Derive an expression for the overall voltage gain of an amplifier with negative feedback. Explain how negative feedback improves the performance of an amplifier.	10	L3	CO1
	Module-02			
11.	State and explain the conditions for sustained oscillations (Barkhausen criterion).	6	L2	CO2
12.	With a neat circuit diagram, explain the working of a Wien bridge oscillator.	8	L2	CO2
13.	Explain the operation of a three-stage ladder RC network (RC phase-shift) oscillator with a neat circuit diagram.	6	L2	CO2
14.	Write short notes on the crystal-controlled oscillator, including its working principle and waveform.	6	L2	CO2
15.	Explain the single-stage astable oscillator with a circuit diagram.	6	L2	CO2
16.	List and explain the characteristics and parameters of an ideal operational amplifier.	6	L2	CO2
17.	Explain the operation of an inverting amplifier using an Op-Amp and derive its voltage gain expression.	8	L3	CO2
18.	Draw and explain the working of a non-inverting amplifier using an Op-Amp and derive its voltage gain expression.	8	L3	CO2

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19.	Explain the operation of an Op-Amp integrator with circuit diagram and output waveforms.	8	L2	CO2
20.	Explain the operation of an Op-Amp differentiator with circuit diagram and output waveforms.	8	L2	CO2
	Module-03			
21.	Draw the block diagram of a modern communication system and explain the function of each block.	10	L2	CO3
22.	Write short notes on noise and its effects in communication systems.	6	L2	CO3
23.	Discuss the different types of radio wave propagation: ground wave, space wave and sky wave.	7	L2	CO3
24.	Explain the concept of noise and briefly describe the different types of radio wave propagation.	10	L2	CO3
25.	Explain Amplitude Modulation (AM) with neat waveforms.	7	L2	CO3
26.	Explain the generation of Frequency Modulation (FM) with neat waveforms.	8	L2	CO3
27.	Compare analog and digital communication and list the advantages of digital communication.	6	L2	CO3
28.	What are the advantages of digital modulation over analog modulation?	6	L1	CO3
29.	Explain Amplitude Shift Keying (ASK) with a neat waveform.	6	L2	CO3
30.	Describe Frequency Shift Keying (FSK) and Phase Shift Keying (PSK) with neatly labelled waveforms.	7	L2	CO3
	Module-04			
31.	Define an embedded system and explain the classification of embedded systems based on generation.	10	L2	CO4
32.	Define embedded systems and list their key characteristics. Also list the major application areas of embedded systems.	10	L2	CO4
33.	Explain the classification of embedded systems based on complexity and performance.	8	L2	CO4
34.	Discuss the purpose of embedded systems.	6	L2	CO4
35.	Differentiate between embedded systems and general-purpose computing systems.	6	L2	CO4
36.	Compare RISC and CISC architectures.	6	L2	CO4
37.	Compare General Purpose Processors (GPP) and Application Specific Instruction-set Processors (ASIP).	6	L2	CO4
38.	Compare microprocessor and microcontroller in terms of architecture, performance and applications.	10	L2	CO4
39.	Explain the role of memory in embedded systems.	6	L2	CO4

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40.	Explain the role of sensors, actuators and display devices (LED and 7-segment display) in embedded systems.	10	L2	CO4
	Module-05			
41.	Convert the following numbers: (i) $(101101)_2$ to decimal and hexadecimal (ii) $(7F)_{16}$ to binary and octal.	5	L3	CO5
42.	Convert: (i) $(110101)_2$ to decimal and octal (ii) $(25F)_{16}$ to binary and decimal (iii) $(41.6875)_{10}$ to octal and binary.	5	L3	CO5
43.	Explain the 1's and 2's complement methods of subtraction with examples.	7	L2	CO5
44.	Subtract the following using 10's complement: (i) $(72532 - 3250)_{10}$ (ii) $(3250 - 72532)_{10}$.	5	L3	CO5
45.	Using basic Boolean theorems, prove: (i) $(x + y)(x + z) = x + yz$ (ii) $xy + xz + y\bar{z} = xz + y\bar{z}$.	5	L3	CO5
46.	State and prove De Morgan's theorems with truth tables.	6	L3	CO5
47.	Express the Boolean function $F = A + \bar{B}C$ in sum of minterms.	5	L3	CO5
48.	Express the Boolean function $F = xy + \bar{x}z$ in product of maxterms.	5	L3	CO5
49.	Explain the design procedure for combinational logic circuits with a suitable example.	6	L3	CO5
50.	Explain the half adder with its truth table. Implement a full adder circuit with its truth table and write the expressions for sum and carry.	10	L3	CO5

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