Reg. No.															

Question Paper Code	13761

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Second Semester

Computer Science and Business Systems

24BSPH205 - PRINCIPLES OF ELECTRONICS ENGINEERING

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	An electron and a hole in close proximity would tend to _____. (a) attract each other (b) repel each other (c) have no effect on each other (d) destroy each other	1	K1	CO1
2.	Forbidden energy gap contains electrons that (a) Belong to innermost orbits of atoms (b) Belong to outermost orbits of atoms (c) Are shared to form a bond between atoms (d) It contains no electrons	1	K1	CO1
3.	The knee voltage of a crystal diode is approximately equal to _____ (a) applied voltage (b) breakdown voltage (c) forward voltage (d) barrier potential	1	K1	CO2
4.	The zener diode is heavily doped because_____ (a) to have low breakdown voltage (b) to have high breakdown voltage (c) to have high current variations (d) to maintain perfect quiescent point	1	K1	CO2
5.	If alpha=0.98, I_{co} =6μA, & I_B =100μA for a transistor, then the value of I_c will be_____ (a) 2.3mA (b) 3.1mA (c) 4.6mA (d) 5.2mA	1	K2	CO3
6.	The word 'diode' is used to indicate that the device has ---------- (a) two junctions (b) two electrodes (c) two anodes (d) two cathodes	1	K1	CO3
7.	In the voltage-series feedback topology, the feedback signal is applied: (a) In series with the output (b) In series with the input (c) In parallel with the input (d) In parallel with the output	1	K1	CO4
8.	Feedback decreases the output impedance of an amplifier in: (a) Voltage-series feedback (b) Voltage-shunt feedback (c) Current-series feedback (d) Current-shunt feedback	1	K1	CO4
9.	In differential-mode, _____ (a) opposite polarity signals are applied to the inputs (b) the gain is one (c) the outputs are of different amplitudes (d) only one supply voltage is used	1	K2	CO5
10.	The input offset current equals the_____ (a) difference between two base current (b) average of two base current (c) collector current divided by current gain (d) none of these	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Define Fermi energy level.	2	K2	CO1
12.	What is meant by donor energy level?	2	K1	CO1
13.	Draw the V-I characteristics of Pn junction diode.	2	K2	CO2
14.	What is Avalanche breakdown?	2	K1	CO2
15.	What is cut off region?	2	K1	CO3
16.	Compare JFET and MOSFET.	2	K3	CO3

17.	Distinguish between positive and negative feedback.		*2*	*K3*	*CO4*
18.	Define bandwidth of an amplifier.		*2*	*K2*	*CO4*
19.	What are PID circuits?		*2*	*K1*	*CO5*
20.	What is the frequency response of an OP-AMP?		*2*	*K1*	*CO5*
21.	Define Full subtractor.		*2*	*K2*	*CO6*
22.	Why NAND gates are universal?		*2*	*K2*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Derive an expression for the density of holes in an intrinsic semiconductor.	*11*	*K3*	*CO1*
		OR			
	b)	Derive an expression for the carrier concentration in N-type semiconductor and also explain the variation of Fermi energy level and carrier concentration with temperature in an extrinsic semiconductor.	*11*	*K3*	*CO1*
24.	a)	Explain the forward and reverse bias of PN junction diode.	*11*	*K3*	*CO2*
		OR			
	b)	With neat sketch explain the mechanism of half wave rectifier.	*11*	*K3*	*CO2*
25.	a)	How do you construct a transistor in C-B configuration? Explain its characteristics.	*11*	*K2*	*CO3*
		OR			
	b)	How do you construct n-JFET? Explain its performance and reliability in switching applications.	*11*	*K2*	*CO3*
26.	a) (i)	Write down the various characteristics of topology.	*6*	*K2*	*CO4*
	(ii)	In designing a feedback control system for a precision amplifier, how would you utilize CCVS configurations to optimize the system's performance? Explain.	*5*	*K2*	*CO4*
		OR			
	b) (i)	Explain the construction and working of Colpitts Oscillator.	*6*	*K2*	*CO4*
	(ii)	Deduce relation for input and output impedance of the feedback amplifier.	*5*	*K2*	*CO4*
27.	a)	How do you develop a differentiator using op-amp? Explain.	*11*	*K2*	*CO5*
		OR			
	b)	How would you construct an operational amplifier in the non-inverting configuration to achieve a desired voltage gain? Explain.	*11*	*K2*	*CO5*
28.	a)	Develop the working of half adder and full adder using circuit diagrams and truth tables.	*11*	*K3*	*CO6*
		OR			
	b)	What are flip-flops? Explain any three types of flip-flops.	*11*	*K3*	*CO6*