Q. Code:448002

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Second Semester

EC18201 – ELECTRON DEVICES

(Electronics and Communication Engineering)

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Depicted the construction, working principle and V – I (Voltage and Current) characteristics of PN Junction diode.	**2**
CO 2	Explore and analyze the construction, working principle, Input and Output characteristics of BJT (Bipolar Junction Transistor).	**4**
CO 3	Expose construction, working principle, drain and transfer characteristics of FET, MOSFET and cutting edge technology of FINFET, Dual Gate MOSFET.	**4**
CO 4	Express Incredible performance of the special semiconductor devices.	**4**
CO 5	Illustrate the construction, working principle, characteristics and applications of power and display device.	**4**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Write the expression for diode current equation with necessary explanation.	**1**	**2**
2.	Sketch the forward and reverse bias characteristics of a PN junction diode.	**1**	**1**
3.	Distinguish between the different configurations of transistor.	**2**	**2**
4.	The transistor has I_E = 10 mA and α = 0.98. Determine the value of I_B and I_C.	**2**	**2**
5.	Justify how FET acts as a voltage variable resistor.	**3**	**3**
6.	Sketch the circuit symbol for n-channel and P-channel D MOSFET and E MOSFET.	**3**	**1**
7.	Outline the working principle of LDR.	**4**	**2**
8.	Draw the energy band diagram of metal and semiconductor junction.	**4**	**2**

9.	Differentiate between DIAC and TRIAC.		**5**	**2**	
10.	Define quantum efficiency in an LED.		**5**	**2**	

PART- B (5 x 14 = 70 Marks)

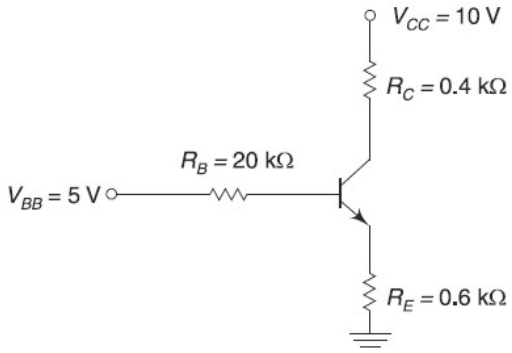
			Marks	CO	RBT LEVEL
11. (a)	Derive the expression for PN junction diode current with suitable diagram and explanation for forward current and reverse current.		**(14)**	**1**	**3**
	(OR)				
(b)	Differentiate between drift and diffusion current. Derive the expression for drift current density and diffusion current density in a semiconductor.		**(14)**	**1**	**3**
12. (a)	Analyze the working mechanism of CE configuration of BJT with its input and output characteristics. Also define the hybrid parameters.		**(14)**	**2**	**4**
	(OR)				
(b)	**(i)**	Illustrate the h parameter model of transistor in CE configuration with suitable circuit diagram.	**(6)**	**2**	**4**
	(ii)	Explain the Eber's Moll model for BJT with Emitter and Collector current expressions.	**(8)**	**2**	**4**
13. (a)	Explain the construction and the drain and transfer characteristics of N-channel JFET.		**(14)**	**3**	**3**
	(OR)				
(b)	Explain the construction and principle of operation of Depletion mode MOSFET with the help of suitable diagram.		**(14)**	**3**	**3**
14. (a)	**(i)**	Examine the operation of zener diode and draw the forward and reverse bias characteristics.	**(8)**	**4**	**3**
	(ii)	Illustrate how zener diode is used in Voltage regulation.	**(6)**	**4**	**3**
	(OR)				
(b)	**(i)**	With the help of two valley theory explain the working of gunn diode.	**(8)**	**4**	**3**
	(ii)	Illustrate the working mechanism of varactor diode. List out its applications.	**(6)**	**4**	**3**
15. (a)	Draw the basic structure of UJT and explain the working and characteristics of UJT with the help of equivalent circuit.		**(14)**	**5**	**3**
	(OR)				
(b)	**(i)**	Examine the concept behind LCD along with its applications.	**(8)**	**5**	**3**
	(ii)	Describe the working of photo transistor and optocoupler.	**(6)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL

16. Determine the I_B, I_C, I_E, and V_{CE} of the circuit shown in Figure. Assume that $\beta = 100$ and V_{BE} (on) = 0.7 V. **(10)** 2 **5**



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