Q. Code:727816

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

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

Third Semester

EE18301 – ELECTRON DEVICES AND CIRCUITS

(Electrical and Electronics Engineering)

(Regulation2018/2018A)

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

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Describe and analyse different types of PN devices.	**4**
CO 2	Describe and analyse different types of current and Voltage controlled devices	**4**
CO 3	Analyse performance of devices using small signal model	**4**
CO 4	Design and implementation of various electronic devices in circuits	**4**

PART- A(10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Relate the voltage and current of forward biased pn junction diode.	**1**	**3**
2.	What are the limitations of Zener diode regulator?	**1**	**2**
3.	State the operating modes of BJT with reference to junction biasing	**2**	**2**
4.	How ac equivalent circuit is obtained in BJT amplifier?	**3**	**3**
5.	Why thermal runaway is not occur in FETs?	**2**	**2**
6.	Draw the high frequency equivalent circuit for the MOSFET.	**3**	**2**
7.	State the need for neutralization in tuned amplifiers.	**4**	**2**
8.	An amplifier has a midband gain of 100 and has a bandwidth of 200KHz.Find the band width, when negative feedback is applied with feedback ratio of 0.04.	**4**	**3**
9.	List out the disadvantages of RC phase shift oscillator.	**4**	**2**
10.	Mention the applications of Opto-coupler.	**4**	**2**

PART- B (5x 14=70Marks)

			Marks	CO	RBT LEVEL
11. (a)		With the neat circuit diagram and waveform, explain the operation of a half wave rectifier which produces a positive output voltage. Also derives its various parameters.	**(14)**	**1**	**3**
		(OR)			
(b)	**(i)**	Enumerate the concept of Zener breakdown in PN junction with its V-I Characteristics.	**(7)**	**1**	**3**
	(ii)	With the neat circuit diagram and waveform, describe the operation of biased parallel clipper.	**(7)**	**1**	**3**
12. (a)		From the two port model of BJT amplifier in CE configuration, Derive the expression for input impedance, current gain voltage gain and output	**(14)**	**3**	**3**

impedance.

(OR)

(b)	Derive the expression for current gain, voltage gain, input impedance and output impedance for an emitter follower circuit.	**(14)**	**3**	**3**

13. (a)	**(i)**	In a certain application needs the voltage controlled resistor component. Identify and explain the characteristics of that component.	**(8)**	**2**	**3**
	(ii)	The data sheet of an enhancement MOSFET gives $I_{D(on)}$=400mA at V_{GS}=10V and $V_{GS(th)}$=1V.Find the drain current foe V_{GS}=5V.	**(6)**	**2**	**3**

(OR)

(b)	With neat diagram, Illustrate the operation and characteristics of normally on MOSFET.	**(14)**	**2**	**3**

14. (a)	Illustrate the operation of emitter coupled differential amplifier and deduce the expression for common mode and differential mode gains.	**(14)**	**4**	**3**

(OR)

(b)	Identify the feedback topology used in Common emitter amplifier circuit with emitter resistance and derive the voltage gain, input impedance and output impedance with feedback.	**(14)**	**4**	**3**

15. (a)	Discuss the principle and operation of a Hartely oscillator with a circuit. Also deduce an expression for frequency of oscillations.	**(14)**	**4**	**3**

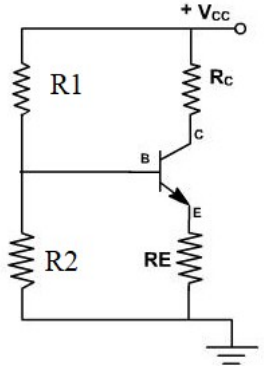
(OR)

(b)	**(i)**	Analyze the operation of a twisted – nematic field-effect LCD in its transmissive and reflective mode operation	**(10)**	**4**	**3**
	(ii)	Compare the LED with pn junction diode.	**(4)**	**4**	**3**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	For the circuit shown in figure below, V_{CC}=20V, R_C=2KΩ, β=50, V_{BE}=0.2V, R_1=100KΩ, R_2=10KΩ, RE=100Ω. Calculate I_B, VCE, IC and Stability factor.	**(10)**	**2**	**4**



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