**C**

**Reg. No. :** | | | | | | | | | | |

## Question Paper Code: 93405

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Third Semester

Electronics and Communication Engineering

19UEC305 - Analog circuits

(Regulation 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The cut in voltage or $V_{BE}$ of silicon diode or transistor is ---- CO1- U

   (a) 0.7v (b) 0.3v (c) 0.4v (d) none of the above

2. In a FET amplifier , the source follower is a --------- CO2- R

   (a) CS amplifier (b) CG amplifier (c) CD amplifier (d) none of the above

3. In class B amplifier,VCE(min)=2V and supply voltage Vcc=15V.Find the collector circuits efficiency. CO5- A

   (a) 68.06% (b)45% (c) 23% (d) 50%

4. When negative voltage feedback is applied to an amplifier, its voltage gain …… CO1- U

   (a) Is increased (b) Is reduced

   (c) Remains the same (d) None of the above

5. The feedback signal in a(n)---------oscillator is derived from an inductive voltage divider in the LC circuit CO1- R

   (a) Hartley (b) Armstrong (c) Colpitts (d) Wein bridge

PART – B (5 x 3= 15 Marks)

6. Draw D.C load line, A.C load line and mark the various points. CO1 U

7. For an amplifier, 3dB gain is 200 and higher cut off frequency is 20kHz. Find the gain of the amplifier at frequency 100kHz. CO4 Ana

8. Differentiate class A amplifier and class B amplifier. CO1 U

9. Define phase margin and gain margin. CO1 R

10. Give the Barkhausen criterion for oscillators. CO1 R

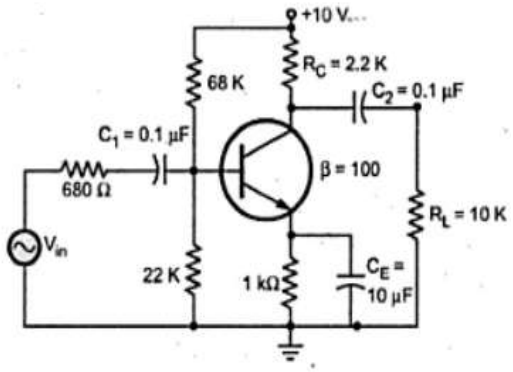
PART – C (5 x 16= 80 Marks)

11. (a) Derive the expression of stability factor for voltage divider biasfor BJT CE configuration with neat diagrams. CO1- U (16)

Or

(b) Consider the self-bias circuit where $V_{cc}$=15V, $R_c$=3KΩ, $R_2$=10KΩ, $R_1$=90KΩ, $h_{fe}$=55(β), $V_{BE}$=0.6V. The transistor operates in active region. Determine i) operating point ii) stability factor iii) D.C load line. Analyze and suggest, whether the circuit is suitable to get faithful amplification. CO4- App (16)

12. (a) Determine the low frequency response of the amplifier circuit shown in the figure CO4- App (16)



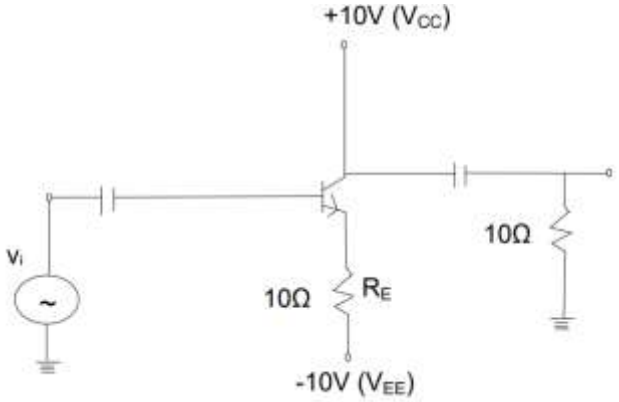

Or

(b) Examine the response of BJT amplifier under high frequency and analyze the parameters with necessary diagrams. CO2- Ana (16)

13. (a) Explain the operation of class B power amplifier circuit using power transistor and calculate its maximum efficiency. CO1- U (16)

Or

(b) Calculate maximum ac output power and efficiency of the amplifier shown in fig. VBE may be assumed negligibly small. CO5- Ana (16)




14. (a) Draw the circuit of voltage series feedback amplifier and derive the expression for input resistance and output impedance. CO1- U (16)

Or

(b) When negative voltage feedback is applied to an amplifier of gain 100, the overall gain falls to 50. CO3- Ana (16)
(i) Calculate the fraction of the output voltage feedback.
(ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 75.

15. (a) A Colpitts Oscillator circuit having two capacitors of 24nF and 240nF respectively are connected in parallel with an inductor of 10mH. Determine the frequency of oscillations of the circuit, the feedback fraction and draw the circuit. CO3- Ana (16)

Or

(b) Explain Colpitts oscillator and derive the equation for oscillation? CO1- U (16)