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Reg. No. :

Question Paper Code : 53404

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Electronics and Communication Engineering

15UEC304-ELECTRONIC CIRCUITS

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Both the collector-base and base-emitter junctions are forward-biased   CO1- R
    in

    (a) Active region   (b) Cutoff region   (c) Saturation region   (d) All the above

2. A differential amplifier with differential gain of 300 and common   CO2- App
    mode gain of 0.2 will have CMRR of

    (a) 63.52 dB   (b) 52.63dB   (c) 20dB   (d) 40dB

3. The cutoff frequency that occurs when the common emitter current   CO3- U
    gain value drops to 0.707 of its low frequency value is called as

    (a) Alpha frequency   (b) Beta frequency   (c) Gamma frequency   (d) Bandwidth

4. The output stage of a multistage amplifier usually employs   CO4-R

    (a) Push-pull amplifier   (b) Preamplifier   (c) Class A amplifier   (d) All the above

5. Negative feedback is employed in   CO5- R

    (a) Oscillators   (b) Rectifiers   (c) Amplifier   (d) None of these

PART – B (5 x 3= 15Marks)

6. Define Thermal Runaway?   CO1-R

7. Why CE configuration is preferred for amplification?   CO2-U

8. Find the unity gain bandwidth of MOSFET whose g_m = 6 mA/V, C_{gs} = 8 pF,   CO3-App

$C_{gd} = 4$ pF and $C_{ds} = 1$ pF.

9. Compare the efficiencies of all the power amplifiers. CO4-Ana

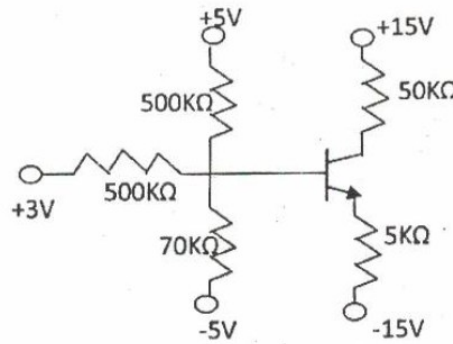10. Mention the applications of class C tuned amplifier. CO5- R

PART – C (5 x 16= 80Marks)

11. (a) For the circuit shown in figure, let $h_{fe} = 100$. CO1-App (16)

(i) Find V_{TH} and R_{TH} for the base circuit.

(ii) Determine I_{CQ} and V_{CEQ}.

(iii) Draw the DC load line.

Or

(b) With necessary diagrams, explain the methods used in biasing the FET and MOSFET. CO1- U (16)

12. (a) Draw and explain Darlington pair using BJT and derive the expressions for Voltage gain, Current gain, input and output impedance. CO2- U (16)

Or

(b) Explain the operation of an emitter coupled differential amplifier with constant current source to improve stability and derive its CMRR. CO2- U (16)

13. (a) With neat sketch, explain hybrid-π equivalent circuit of CE amplifier. Derive the expression for various components in terms of 'h' parameters. CO3-U (16)

Or

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(b) Find the Midband gain A_m and upper 3dB frequency f_h of CS   CO3-App   (16)
amplifier fed with a signal source having an internal resistance
$R_{sig}=100$ KΩ. The amplifier has $R_G = 4.7MΩ$, $R_D = R_L = 15KΩ$,
$g_m = 1mA/V$, $r_0 = 150KΩ$, $C_{gs} = 1pF$ and $C_{gd} = 0.4$ pF.

14. (a) Explain the working of a transformer – coupled class A power   CO4 U   (16)
amplifier circuit and derive the expression for its efficiency.

<div align="center">Or</div>

(b) Draw the circuit diagram and explain the operation of class B push   CO4 U   (16)
pull amplifier. Also discuss its merits.

15. (a) With a neat diagram, derive the expression for R_{if}, R_{of}, A_v and A_{vf} CO5- U   (8)
for the following
(i) Voltage series feedback amplifier

(ii) Current shunt feedback amplifier   CO5- U   (8)

<div align="center">Or</div>

(b) Discuss Nyquist criterion for stability of feedback amplifier, with   CO5- U   (16)
the help of Nyquist plot.

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