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**Question Paper Code: 53404**

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

Third Semester

Electronics and Communication Engineering

15UEC304 - ELECTRONIC CIRCUITS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. Which transistor bias circuit provides good Q-point stability with a single-polarity supply voltage? CO1- R  
(a) base bias (b) collector-feedback bias  
(c) voltage-divider bias (d) emitter bias
2. In a BJT, largest current flow occurs CO2- U  
(a) in the emitter (b) in the collector (c) in the base (d) through CB junction
3. The frequency that is 1 octave above 5 kHz is CO3- R  
(a) 10kHz (b) 1kHz (c) 20kHz (d) 100kHz
4. The maximum overall efficiency of a transformer coupled class-A amplifier is \_\_\_ percent. CO4- R  
(a) 78.5 (b) 25 (c) 50 (d) 85
5. Negative feedback is advantage in CO5- R  
(a) amplifier (b) oscillator (c) inverter (d) rectifier

PART – B (5 x 3= 15Marks)

6. What are the requirements for biasing circuits? CO1- U
7. Mention two advantages which are specific to Darlington connection. CO2- U
8. Clarify how the number of stages in a multistage amplifier influences the cut-off frequency and bandwidth. CO3- U
9. What is cross-over distortion? How it can be eliminated? CO4- U
10. Mention the applications of class C tuned amplifier. CO5- U

PART – C (5 x 16= 80Marks)

11. (a) Consider a fixed bias transistor amplifier with collector resistor  $R_C = 8\text{ k}\Omega$ , load resistor  $R_L = 24\text{ k}\Omega$  and bias voltage  $V_{CC} = 24\text{V}$ . Draw the DC load line and determine the optimum operating point. Also draw the AC load line. CO1-U (16)

Or

- (b) List out the various bias compensation methods and explain them. CO1 -Ana (16)
12. (a) Discuss in detail methods of increasing input impedance using Darlington connection. CO2 -U (16)

Or

- (b) (i) Draw the circuit diagram for an emitter coupled differential amplifier using BJTs. Describe common mode and differential mode of working. CO2 -U (10)
- (ii) Determine the output voltage of a differential amplifier for the input voltages of  $300\mu\text{V}$  and  $240\mu\text{V}$ . The differential gain of the amplifier is 5000 and the value of the CMRR is i) 100 and ii)  $10^5$ . CO2 -U (6)

13. (a) Derive the expression for frequency response of multistage amplifier CO3- App (16)

Or

- (b) Explain the operation of high frequency common source FET amplifier with neat diagram. Derive the expression for  
i) voltage gain,  
ii) Input admittance,  
iii) Input capacitance and Output admittance. CO3- U (16)

14. (a) (i) Compare class A, class B and class C power amplifier in their performance and efficiency. CO4-Ana (8)  
(ii) Find the value of supply voltage required to deliver 20W to a 50Ω load by an ideal class D amplifier. CO4-Ana (8)

Or

- (b) (i) Prove that the maximum efficiency for class A transformer coupled power amplifier is 50%. CO4 -App (8)  
(ii) Draw the circuit of class B push-pull amplifier and discuss its merits. CO4 -U (8)
15. (a) Explain the Nyquist criterion for stability of feedback amplifiers. CO5- App (8)  
(ii) A tank circuit contains an inductance of 1mH. Find out the range of tuning capacitor value if the resonant frequency ranges from 540kHz to 1650kHz. CO5- E (8)

Or

- (b) Explain the operation of class C tuned amplifier with neat circuit diagram and waveform. Also derive the efficiency and mention the applications. CO5- App (16)

