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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**

(AUTONOMOUS)

**B.Tech II Year II Semester Supplementary Examinations July-2021****ELECTRONIC CIRCUIT ANALYSIS**

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)**UNIT-I**

1 a Why hybrid model is used for the analysis of BJT amplifier at low frequencies? Draw the hybrid model for CE transistor and derive the parameters. **6M**

b Compare the CE, CB and CC transistor amplifier parameters. **6M**

**OR**

2 Using low frequency h-parameter model, derive the expressions for voltage gain, current gain, input impedance and output admittance for a BJT Amplifier in CE configuration. **12M**

**UNIT-II**

3 a Draw the Hybrid- $\pi$  model and explain the significance of each and every component in it. **6M**

b Derive the expression for Hybrid- $\pi$  capacitance of CE transistor at high frequency. **6M**

**OR**

4 a Describe the relationship between low frequency h-parameters and high frequency Parameters. **8M**

b Write about Collector junction capacitance and Emitter junction capacitance of Hybrid- $\pi$  model. **4M**

**UNIT-III**

5 a Explain the classification of amplifiers. **6M**

b Discuss the need of cascading amplifiers. **6M**

**OR**

6 a Explain the effect of cascading of amplifiers on bandwidth. **6M**

b An amplifier consists of 3 identical stages in cascade. The bandwidth of overall amplifier extends from 20 Hz to 20 kHz. Calculate the bandwidth of individual stage. **6M**

**UNIT-IV**

7 a Discuss Feedback topologies. **6M**

b An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. If the open loop gain changes by 10% due to temperature, find the percentage change in gain of the amplifier with feedback. **6M**

OR

- 8 a State Barkhausen Criterion for oscillations. Explain the principle of operation of oscillator. 6M
- b Classify the different types of oscillators. 6M

**UNIT-V**

- 9 a Discuss with diagram, Transformer coupled Class A Power Amplifier and derive its Maximum efficiency. 6M
- b Explain second harmonic distortion by three point method. 6M

OR

- 10 a A single tuned RF amplifier uses a transistor with an output resistance of  $50\text{ K}\Omega$ , output capacitance of  $15\text{ pF}$  and internal resistance of next stage is  $20\text{ k}\Omega$ . The tuned circuit consists of  $47\text{ pF}$  capacitance in parallel with series combination of  $1\mu\text{H}$  inductance and  $2\Omega$  resistance. Calculate resonant frequency, effective quality factor and bandwidth of the circuit. 6M
- b Explain the advantages, disadvantages and applications of Tuned Amplifiers. 6M

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