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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **ET251U - Electronic Circuits & Applications**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Que 1 a) is compulsory. Solve any one from sub-question b) and c).

- a) Draw the block diagrams of four basic amplifiers and comment on its input and output resistances. [8]
- b) In Voltage Series feedback amplifier, the voltage gain, input impedance and output impedance without feedback are 20, 1 M Ω and 8K Ω respectively. The 20% output voltage is feedback in series with input. Determine Av β , Rif, Rof of negative feedback amplifier. [4]
- c) Give the comparison between positive and negative feedback. [4]

2) Que 2 is compulsory.

- a) A Transformer Coupled Class A amplifier uses a step down transformer with 3:1 turns ratio to feed a 8 Ω loudspeaker. The stage is powered with $V_{CC} = 12$ V. If $I_{CQ} = 140$ mA, $V_{CE(\min)} = 1.2$ V, $V_{CE(\max)} = 22$ V, $I_{C(\min)} = 20$ mA and $I_{C(\max)} = 250$ mA. Calculate: [8]
 - (i) Reflected load on primary side, (ii) AC power delivered to load,
 - (iii) DC Power input, (iv) Percentage Conversion efficiency.
- b) Explain with neat diagram of crossover distortion. [4]

3) Que 3 is compulsory.

- a) Draw the circuit diagram of Dual Input Balanced Output (DIBO) Differential Amplifier and redraw its DC equivalent circuit. Give the expressions for: [8]
 - (i) Emitter Current, (ii) Collector to Emitter Voltage.
- b) The DIBO differential amplifier has following specifications: $R_C = 2.2$ k Ω , $\beta_{ac} = 100$ and $I_E = 0.989$ mA. Calculate the voltage gain and input resistance of amplifier. [4]

4) Que 4 a) is compulsory. Solve any one from sub-question b) and c).

- a) Draw and explain RC Phase Shift Oscillator using BJT. Give the expression for frequency of oscillation and condition of h_{fe} for BJT. What should be minimum value of h_{fe} to be selected in order to oscillate the circuit. [8]
- b) Draw the circuit diagram of Astable Multivibrator using OP-AMP and find the value of frequency of oscillation if $R_1 = 10$ k Ω , $R_2 = 8.6$ k Ω , $R_F = 100$ k Ω and $C = 0.01$ μ F. [4]
- c) Explain the operation of BJT as a Switch with neat circuit diagram. [4]

5) Que 5 is compulsory.

- a) Draw and explain the block diagram of regulated power supply with neat waveforms. [6]
- b) Draw the typical circuit for a series pass transistor type linear regulator and give the important features for General Purpose Precision IC 723 Voltage Regulator. [4]
- c) Give the names of IC for three terminal fixed and adjustable voltage regulator. [2]

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