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Question Paper Code: 80121

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Electronics and Communication Engineering

EC 8452 — ELECTRONIC CIRCUITS — II

(Common to Electronics and Telecommunication Engineering)

(Regulation 2017)

Time: Three hours

Maximum: 100 marks

Answer ALL questions.

PART A — $(10 \times 2 = 20 \text{ marks})$

- 1. Why frequency compensation is required in amplifiers?
- 2. What is gain margin?
- 3. Draw the electrical equivalent circuit of crystal.
- 4. What is the need for amplitude control in oscillators?
- 5. State the difference between loaded and unloaded Q.
- 6. What is the basic principle behind tuned amplifiers?
- 7. State the condition under which the RC high pass filter can act as a differentiator.
- 8. Why clamper circuit is called DC restorer?
- 9. Define the term Total Harmonic Distortion.
- 10. What is a DC/DC converter?

PART B — $(5 \times 13 = 65 \text{ marks})$

11. (a) Discuss the effects of negative feedback on the properties of amplifiers in detail with relevant analytical expressions.

Or Or

- (b) Discuss in detail about the impact of feedback on the amplifier with single and two poles.
- 12. (a) With relevant diagrams, explain the operation of (i) Ring oscillator and (ii) Crystal oscillator.

Or

- (b) With a neat diagram, explain the operation of the Wien-bridge oscillator. Also derive the expression for the frequency of oscillation.
- 13. (a) Explain how flat band response is achieved in stagger tuned amplifier?

Or

- (b) Discuss on the effect of cascading single and double tuned amplifier on bandwidth.
- 14. (a) With circuit diagram, waveforms and relevant expressions explain the operation of (i) Attenuator and (ii) RC integrator.

Or

- (b) Explain with circuit diagram, waveforms and relevant expressions the operation of UJT oscillator.
- 15. (a) Explain the different classes of power amplifiers and compare them.

Or

(b) Explain the working of the three commonly used DC/DC converters with circuit and response diagrams.

PART C —
$$(1 \times 15 = 15 \text{ marks})$$

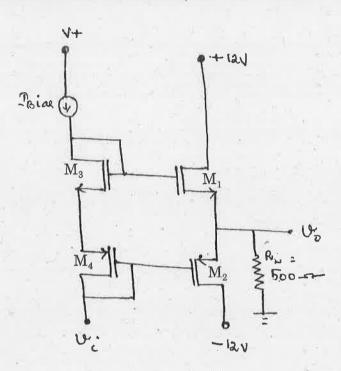
16. (a) Consider a three-pole amplifier with a loop gain function given by,

$$T(f) = \frac{10^5}{\left(1 + j\frac{f}{5 \times 10^5}\right) \left(1 + j\frac{f}{10^2}\right) \left(1 + j\frac{f}{5 \times 10^8}\right)}$$

Stabilize the circuit by inserting a new dominant pole. Assume the original poles are not altered. At what frequency must the new pole be placed to achieve a phase margin of 45 degrees?

Or

- (b) An enhancement-mode MOSFET class-AB output stage is shown in the Fig.16(b). The threshold voltage of each transistor is $V_{TN} = -V_{TP} = 1v$ and the conduction parameters of the output transistors are $K_{n1} = K_{p2} = 5 \text{ mA/V}^2$. Let $I_{Bias} = 200 \mu \text{ A}$.
 - (i) Determine $K_{n3} = K_{p4}$ such that the quiescent drain currents in M_1 and M_2 are 5 mA. (6)
 - (ii) Find the small-signal voltage gain $A_v = d_{v0}/d_{v1}$ at $v_0 = 5v$. (9)



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