B. Tech. (EEE) / I

PAPER V—ADVANCED ELECTRONICS
(EEE–105)

Time: 3 hours
Maximum Marks: 70

(Write your Roll No. on the top immediately
on receipt of this question paper.)

Answer any five questions.

Assume suitable missing data, if any.

1. (a) Draw and explain Ebers-Moll model of PNP
transistor.

(b) Draw circuit diagram of npn transistor biased for
CE configuration. Draw and explain its output
characteristics showing all different regions.

(c) Determine all voltages and currents in the circuit
given below, with $\beta_F=100$:

\[ V_{cc} (-10V) \]
\[ V_E \]
\[ V_{ee} (10V) \]

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2. (a) In the cascaded amplifier given below, \( r_n = 0.5 \, k\Omega \) for \( Q_1 \) and \( Q_2 \) and \( r_n = 1 \, k\Omega \) for \( Q_3 \), \( \beta = 100 \) for all the transistors. Find overall voltage gain.

(b) What are the important characteristics of JFET?

c) With the help of a diagram explain pinchoff voltage. What do you mean by stability factors \( S(I_{CO}), S(V_{BE}) \) and \( S(\beta) \)?

3. (a) Compare a FET with a BJT

(b)
Given $I_{DSS} = 12 \ mA$,

$$V_p = -4 \ V$$

Determine Q-point.

(c) Distinguish between Enhancement type and Depletion type MOSFET.

4. (a) Why is negative feedback preferred inspite of loss of gain? Compare it with respect to other parameters.

(b) What are different types of feedback configurations? Explain with example.

5. (a) What are the problems associated with a basic integrator using Op Amp? How can it be sorted out using Lossy Integrator?

(b) What are D.C. characteristics of an Op Amp? Explain.

6. (a) Explain Wein Bridge Oscillator and Colpitt Oscillator with suitable diagram.

(b) Explain with neat block diagram the working of a Push-Pull Amplifier and state what are the advantages of the same.

7. Write short notes on any two of the following:

P. T. O.