

2063

B.E. (Electronics and Communication Engineering)

Third Semester

EC-307: Electronics Devices and Circuits

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

1. Attempt the following:-

- (a) Define operating point or quiescent point of transistor. (1)
- (b) How FET can be employed as a variable resistor? (1)
- (c) Sketch the basic construction of a n-channel depletion-type MOSFET. (1)
- (d) What is an emitter follower? When it is used? (1)
- (e) Define transconductance (g_m) parameter of a FET transistor. (1)
- (f) What is meant by amplifier distortion? (1)
- (g) Discuss diode compensation for V_{BE} . (1)
- (h) List stabilization techniques for a transistor. (1)
- (i) What is the significant difference between the construction of an enhancement-type MOSFET and a depletion-type MOSFET? (1)
- (j) Briefly discuss condition for thermal stability. (1)

PART- A

- 2. a) Derive current voltage equation of enhancement type NMOS transistor. (5)
- b) Derive transconductance (g_m) equation for JFET. (5)
- 3. a) How JFET is different from MOS transistor? What are typical applications of MOS transistors? Discuss voltage divider biasing technique in JFET. (5)
- b) Discuss hybrid parameters of BJT. How they are helpful in analysis of transistor amplifiers. (5)
- 4. Explain in detail stabilization against variations in I_C , V_{BE} , and β for a BJT transistor. (10)

PART- B

- 5. (a) Discuss operation of complementary symmetry push-pull amplifiers. (5)
- (b) What advantages are offered by negative feedback? Explain different types of feedback connections that can be used in amplifiers or oscillators. (5)
- 6. Write short note on following (2.5 x 4 =10)
 - a) Cascode Circuit
 - b) Colpitt's Oscillator
 - c) Class-C Amplifier
 - d) RC coupled amplifier
- 7. Discuss low and high frequency response of BJT. What parameters play important role is frequency response of BJT? (10)

x-x-x

