

Code: 15A04301

B.Tech II Year I Semester (R15) Supplementary Examinations June 2018

ELECTRONIC DEVICES & CIRCUITS

(Common to EEE, ECE and EIE)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- (a) What are the parameters on which the depletion layer capacitance depends?
- (b) Distinguish between SCR and TRIAC.
- (c) A full wave rectifier, using a capacitor filter has to supply 30 V DC to a load resistance of 1 k Ω . Assuming the diode and transformer winding resistance to be negligible, estimate the value of capacitor filter for a ripple factor of 0.01.
- (d) Define ripple factor.
- (e) A transistor has CE current gain of 100. If the collector is 40mA, what is the value of emitter current?
- (f) Distinguish between FET and BJT.
- (g) Define stability factor of transistor.
- (h) What is the advantage of using potential divider bias?
- (i) Why hybrid parameters are called so?
- (j) Write the approximate conversion formulae for current gain and voltage gain of CB configuration from CE configuration.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 With a neat diagram, explain the energy band diagram of PN junction diode.

OR

3 Explain the construction, operation and characteristics of Tunnel diode.

UNIT – II

4 With neat circuit diagram and waveforms, explain the working of full wave bridge rectifier with capacitor filter.

OR5 A 230 V, 50 Hz ac signal is given as input to a centre tapped full wave rectifier through a 5:1 step down transformer. The load resistance is found to be 100 Ω . Determine the dc output voltage, peak inverse voltage and rectification efficiency.**UNIT – III**

6 With a neat circuit diagram, explain the CE configuration of BJT. Also draw and explain its input and output characteristics.

OR

7 With neat diagrams, explain the construction and operating characteristics of EMOSFET.

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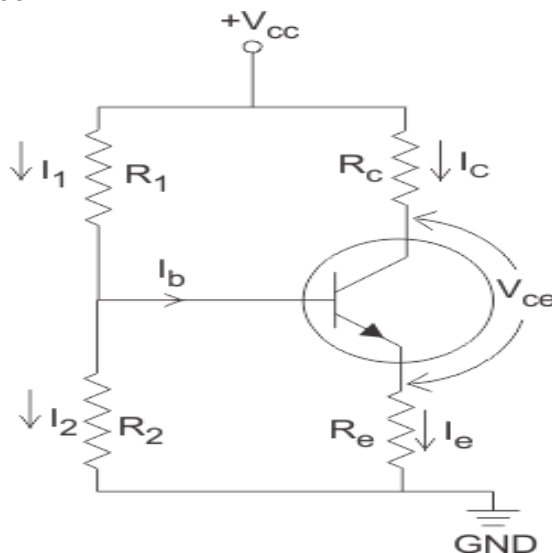
UNIT – IV

8 What is a biasing circuit? Explain the fixed bias and collector to base bias circuits in detail.

OR

9 Determine the value of collector current and collector to emitter voltage for the voltage divider bias circuit shown below.

 $V_{CC} = 10 \text{ V}; R_1 = 10 \text{ k}\Omega; R_2 = 5 \text{ k}\Omega; R_C = 1 \text{ k}\Omega; R_E = 500 \Omega.$

 Assume $V_{BE} = 0.7 \text{ V}$ and $\beta = 100$.

UNIT – V

10 A transistor used in a common base configuration has the following h-parameters:

$$h_{ib} = 28 \Omega; \quad h_{fb} = -0.98; \quad h_{rb} = 5 \times 10^{-4}; \quad h_{ob} = 0.34 \mu \text{ S}$$

 Calculate the values of input resistance, output resistance, current gain and voltage gain, if the load resistance is $1.2 \text{ k}\Omega$. Assume source resistance as zero.

OR

 11 (a) Find the values of h_{fb} and h_{fc} if the values of h_{fe} of a transistor is 50.

(b) Write the conversion formulae for common base configuration from the common emitter h-parameter values.
