Code: 15A04301

R15

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 is 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 kΩ. 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.

OR

5 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.

Contd. in page 2

UNIT – IV

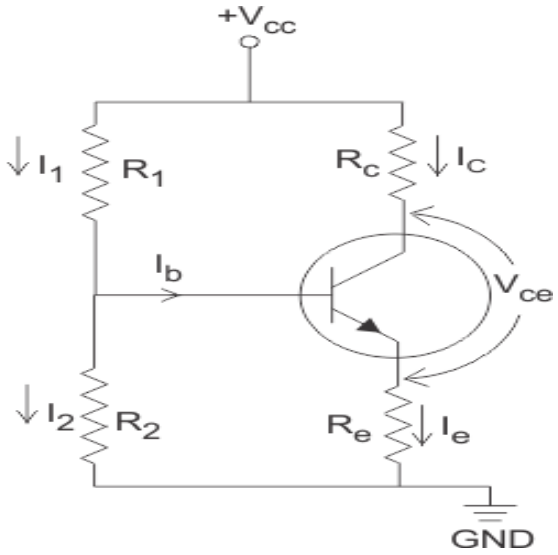
8 What is a biasing circuit? Explain the fixed bias and collector to base bias circuits in detail.

OR

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

V_{CC} = 10 V; R_1 = 10 kΩ; R_2 = 5 kΩ; R_C = 1 kΩ; R_e= 500 Ω.

Assume V_{BE} = 0.7V and β = 100.



UNIT – V

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

$h_{ib} = 28\Omega; \quad h_{fb} = -0.98; \quad h_{rb} = 5\times10^{-4} \quad h_{ob} = 0.34\mu\text{J}$

Calculate the values of input resistance, output resistance, current gain and voltage gain, if the load resistance is 1.2 kΩ. 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.

*****