

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 43305

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electrical and Electronics Engineering

14UEE305 - SEMICONDUCTOR DEVICES AND CIRCUITS

(Regulation 2014)

Duration: 1.15 hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

- The theoretical maximum conversion efficiency of full wave rectifier is
(a) 81.2% (b) 76% (c) 67% (d) 40.6%
- LEDs have response time of the order of
(a) 0.1ns (b) 1ns (c) 100ns (d) 1 μ s
- Calculate beta (β) of a transistor when alpha (α) = 0.98
(a) 49 (b) 37 (c) 97 (d) 51
- When does a transistor act as a switch?
(a) Operated in linear region (b) Operated in cut off region
(c) Operated in saturation region (d) Operated in cut off and saturated region
- For the operation of N channel E-MOSFET it is necessary that gate voltage is
(a) highly negative (b) highly positive
(c) low positive (d) zero

6. The dynamic drain resistance of MOSFET is of the order of
 (a) $10\text{ K}\Omega$ (b) $500\text{ K}\Omega$ (c) $5\text{ M}\Omega$ (d) $100\text{ M}\Omega$
7. In Colpitts oscillator, the amplifier voltage gain usually has to be substantially larger than
 (a) C_2 (b) C_1 (c) C_1/C_2 (d) C_2/C_1
8. The amplitude stabilizes itself for which the loop gain for the fundamental is reduced to
 (a) zero (b) unity (c) both a and b (d) none of these
9. A clamper circuit affects the peak to peak and rms value of waveform in
 (a) Increases both (b) Decreases both
 (c) No change (d) Increases peak to peak value and decreases rms value
10. Effect of hysteresis is to
 (a) Improve noise immunity (b) Increase response time
 (c) Reduce noise immunity (d) High sensitivity

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Draw the circuit diagram of half wave rectifier and explain its operation with necessary waveforms. Also derive the expression for rectification, efficiency and transformer utilization factor. (8)
12. Describe the construction, operation and characteristics of BJT in common base configuration. (8)
13. Explain with a neat circuit diagram JFET as an amplifier in common source mode. Sketch the V-I characteristics. Also draw its low frequency a.c. equivalent circuit. (8)
14. Explain the different methods of coupling multistage amplifiers. (8)
15. Explain positive and negative clamper with suitable circuit diagrams and waveforms.(8)