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**Question Paper Code : 53305**

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

Third Semester

Electrical and Electronics Engineering

15UEE305-SEMICONDUCTOR DEVICES AND CIRCUITS

(Regulation 2015)

Duration: 1:15hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. Since diodes are destroyed by excessive current, circuits must have CO1- R  
(a) Higher voltage sources (b) Current limiting resistors  
(c) More dopants (d) Higher current sources
2. When a diode is forward biased, the voltage across it CO1- R  
(a) is inversely proportional to the current (b) remains approximately the same  
(c) is directly proportional to the source voltage (d) is directly proportional to the current
3. A current ratio of  $I_C/I_E$  is usually less than one and is called CO2- R  
(a) Beta (b) Theta (c) Alpha (d) Omega
4. A transistor may be used as a switching device or as a CO2-R  
(a) Fixed resistor (b) Turning device (c) Rectifier (d) Variable resistor
5. A JFET has \_\_\_\_\_ power gain CO3- R  
(a) Small (b) Very High (c) Very Small (d) High
6. The input impedance of a MOSFET is of the order of \_\_\_\_\_ CO3- R  
(a) Ohms (b) A few hundred ohms  
(c) Kilo ohms (d) Several Mega ohms

7. An oscillator employs \_\_\_\_\_ feedback. CO4- R  
 (a) Positive (b) Negative  
 (c) Neither positive nor negative (d) Unity
8. An oscillator differs from an amplifier because it \_\_\_\_\_. CO4- R  
 (a) Has more gain (b) Requires no input signal  
 (c) Requires no d.c. supply (d) Always has the same input
9. In pulse width modulation, CO5- R  
 (a) Synchronization is not required between transmitter and receiver  
 (b) Amplitude of the carrier pulse is varied  
 (c) Instantaneous power at the transmitter is constant  
 (d) None of the above
10. The sampling technique having the minimum noise interference is CO5- R  
 (a) Instantaneous sampling (b) Natural sampling  
 (c) Flat top sampling (d) All of the above

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. Analyze the various switching characteristics for HWR and FWR and comment on each. CO1- App (8)
12. Apply the relationship between  $\alpha$ ,  $\beta$  and  $\gamma$  - hybrid model and also derive its analytical expressions. CO2- App (8)
13. Derive the JFET Characteristics and parameters with necessary assumptions. CO3- Ana (8)
14. Elaborately give the points regarding the construction and working of Colpitts oscillator. CO4- U (8)
15. Discuss the various clipper and clamper circuits construction and working along with its characteristics. CO5-U (8)