**Roll No. …………………………………………………………..**

**NEELKANTH INSTITUTE OF TECHNOLOGY**

**B.Tech ENE (Semester IV)**

**SESSIONAL EXAMINATION I 2014-2015**

**ANALOG AND DIGITAL ELECTRONICS (NEC-409)**

***Time: 1:30 Hours Total Marks 30***

***NOTE: - i.*** *be precise in your Answer*

***ii.*** *All section are compulsory*

**SECTION A**

1. **Attempt all the Questions: 1X10=10**
2. The Ip/ Iv ratio of a tunnel diode is of primary importance in
3. Determining tunneling speed of electron
4. The design of an oscillator
5. Amplifier designing
6. Computer application
7. Mark the incorrect statement. A varactor diode
8. Has variable resistance
9. Utilizes the transition capacitance of a junction
10. Has always a uniform doping profile
11. Is often used as an automatic frequency control device
12. High frequency used an oscillator within the frequency range of 10-1000 KHz uses a \_\_\_\_\_\_\_ diode.
13. Tunnel diode
14. PIN diode
15. Schottky Diode
16. Varactor diode
17. A PIN diode frequently used as
18. Peak clipper
19. Voltage regulator
20. Harmonic Generator
21. Switching diode for frequencies up to GHz
22. Schottky diode work on the principle of
23. Metal semiconductor Junction
24. Metal-N type semiconductor junction
25. Metal-P type semiconductor junction
26. Degenerate P & N Type semiconductor
27. If the BJT used an Switch and the input high is applied then the output will be
28. Logically Low
29. Non-determinant
30. Logically High
31. None of these
32. Tunnel diode work in \_\_\_\_\_\_\_\_\_\_\_ & photodiode work in \_\_\_\_\_\_\_\_\_\_.
33. Forward, Reverse
34. Forward, Forward
35. Reverse, Forward
36. Reverse, Reverse
37. Mid-band frequency range coupling and parasitic capacitor
38. Short, Open
39. Open, Open
40. Short, Short
41. Open, Short
42. Tunnel diode has an application in oscillator design, in which region the tunnel diode biased to get the oscillation effect
43. In between the negative resistance region
44. The region where negative resistance behavior start
45. The region where the linear behavior seen
46. When the reverse bias of the varactor diode increase
47. Capacitance decrease
48. Leakage current decrease
49. Negative resistance increase
50. Depletion region decrease

**SECTION B**

1. **Attempt any Five Question : 2X5=10**

1. Draw the band diagram of PN Junction Photo diode under open circuit forward and reverse bias.
2. Draw the characteristics of varactor diode with reference to the applied reverse bias & write down the expression for Cj(V).
3. Write down the material used for the manufacturing of Red, IR, Green, & Yellow LED.
4. Write down the application of tunnel diode and differentiate between tunnel and conventional PN diode.
5. Draw the circuit diagram of MOSFET as a switch and show how the circuit behave when the logic low and high is applied.
6. Write down the definition of Octave and Decade & What happens in mid-band, Low frequency band and high frequency band.
7. For an amplifier 3-dB gain is 200 and higher cut-off frequency is 20KHz. Find the gain of the amplifier at the frequency 100 KHz.

**SECTION C**

1. **Attempt any Two Questions: 5X2=10**

1. By using the model derive an expression for the gain in low frequency band, High frequency band & Mid-frequency Band with suitable diagram.
2. Explain the working of negative resistance oscillator using tunnel diode
3. Explain the basic principle behind the Schottky barrier and write down the application of Schottky diode. (All energy band diagram are required)