**Roll No. …………………………………………………………..**

**NEELKANTH INSTITUTE OF TECHNOLOGY**

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

**SECOND SESSIONAL EXAMINATION 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: 2X10=20**
2. In which mode BJT act as a switch
3. Cut-off & saturation
4. Cut-off &active
5. Active & stauration
6. None
7. Expression for the transition capacitance with alloy junction is
8. Varactor diode has \_\_\_\_\_\_\_\_\_\_\_\_. Because CT value increase by small amount as the temperature increase \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
9. Positive temperature coefficient , increase
10. Negative temperature coefficient, increase
11. Negative temperature coefficient, decrease
12. None
13. In a photodiode reverse current is depend on \_\_\_\_\_\_\_\_\_\_\_.
14. Reverse voltage
15. Light intensity
16. Dark current value
17. None
18. The reverse recovery time in tunnel diode is \_\_\_\_\_\_\_\_ so it is used in \_\_\_\_\_\_\_\_ frequency application.
19. Gain of the amplifier decrease in low frequency region because of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ capacitance.
20. For an amplifier mid-band gain is 100 and the lower cut-off frequency is 1 KHz. The gain of the amplifier at the frequency =20Hz is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
21. For an amplifier, 3 dB gain 200 and higher cut-off frequency is 20 KHz. The gain of the amplifier at frequency 100 Hz is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
22. If |AB|<1, the oscillator circuit shows
23. In transistorized (BJT) Phase shift oscillator he value of hfe (or Beta) should be higher than
24. 44.7
25. 44.54
26. 44.34
27. None

**SECTION B**

1. **Attempt any Four Question : 5X4=20**
2. **i.** In a RC phase shift oscillator, the phase network uses the resistance each of 4.7 K-ohm and the capacitor each of 0.047 micro farad. Find the frequency of oscillation.

**ii.** Estimate the value of R & C for an output of frequency of 1 KHz in RC phase shift oscillator.

1. Design a phase shift oscillator with FET having gm=5000 µS & rd=40 K-ohm. While the resistance in the feedback circuit is 9.7 K-Ohm. Select the proper value of RD and C to have the frequency of oscillation as 5 KHz.
2. Design a Wein bridge oscillator which uses a non- inverting amplifier.
3. Draw the circuit diagram of transistorized **Hartely oscillator**. In this two inductance are 2mH and 20 µH while the frequency is to be change from 950 KHz to 2050 KHz. Calculate the range over which capacitor is to be varied.
4. i. Write a short note on crystal oscillator and draw the circuit diagram of crystal oscillator.

ii. A crystal has (L=2H C=0.01pF R=2 K-Ohm) its mounting capacitor is 2 pF. Calculate its series and parallel resonant frequency.

1. A RC coupled amplifier has mid frequency gain 400 and lower and upper 3 dB frequency 100 Hz and 15 KHz respectively. A negative feedback with β=0.001 is employed into the amplifier circuit. Calculate the gain with feedback and new bandwidth.

**SECTION C**

1. **Attempt any Two Questions: 10X2=20**

1. Explain frequency response of CE BJT amplifier.
2. i. Determine the low frequency response of common source amplifier in terms of mid-band gain.

ii. Determine the high frequency response of the CS amplifier circuit.

1. In brief compare all the feedback configuration.