6422 – A11 – IS BSc (CS) – N – 19

FIRST SEMESTER B.Sc. (CS) DEGREE EXAMINATION, NOVEMBER 2019

BASIC ELECTRICALS AND ELECTRONICS

e : 3 Hours] [Max. Marks : 80

Answer any **five** *full questions.*

Scientific calculators are allowed.

a) Define Alternating Current and derive the expression for Alternating Current.

i.e, i = IM sinwt.

b) Define Average value of alternating voltage and show that I avg = 0.637 IM.

c) Find the relationship between

1) Time period and frequency

2) Angular velocity and frequency. 6 + 6 + 4

a) Explain RLC series circuit with the help of a neat circuit diagram and phasor diagram and derive expression for impedance (Z) and phase angle (ϕ).

b) A capacitor of capacitance 100μF is connected in series with the resistor of resistance 100Ω across 230V, 50HZ supply. Find the

1) Impedance (Z)

2) Total current (I)

3) Power factor (cos ϕ).

c) Explain the different ways of connecting 3-phases and explain elementary 3-phase alternator with necessary equations. 6 + 4 + 6

a) Explain the construction and principle of operation of transformer with necessary equations.

b) Write a note on losses in transformer.

c) Write the emf equation of transformer. 8 + 6 + 2

a) Explain why PN-Junction diode allows flow of current in only one direction and Zener diode allows flow of current in both the directions.

b) Why to use filters in Rectifier circuits? Draw the circuit diagram of center tap Rectifier with filter.

c) Draw the circuit diagrams for Zener diode in forward bias and reverse bias conditions. 6 + 6 + 4

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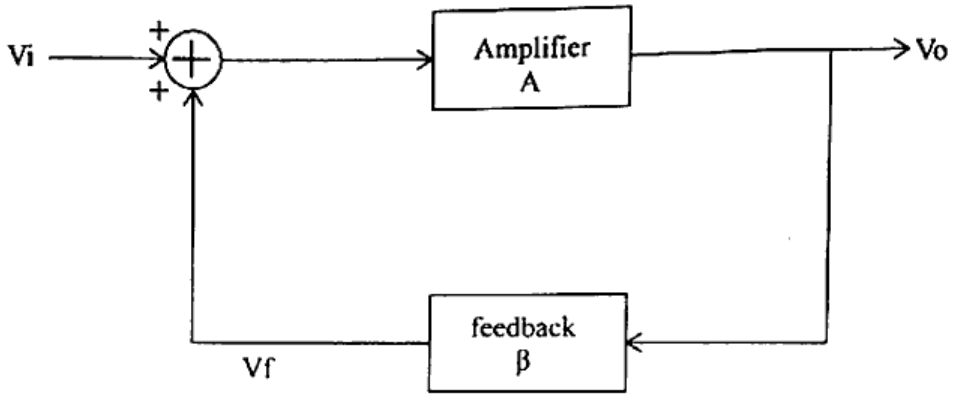
5. a) With necessary circuit diagram explain the CE configuration along with I/P and O/ characteristics of NPN transistor.

   b) With neat circuit diagram explain the working of RC–coupled amplifier. 8 +

6. a) Define oscillator and show that overall gain of the following oscillator is $\frac{A}{1-A\beta}$



   b) With a neat circuit diagram explain the working of Heartly oscillator. Also specify th expression for output frequency.

   c) Explain Ideal characteristics of OPAMP. 4 + 6 +

7. a) With necessary equations and circuit diagram explain how OPAMP can be used as adder o summing amplifier.

   b) Define Amplitude modulation and obtain the expression for amplitude modulated wave.

   c) Write a note on Interferometer. 6 + 6 +

8. Write short notes on any **four** of the following:

   a) LCR Bridge
   b) Block diagram of communication system
   c) IC-741
   d) Depletion Region
   e) Addition of Alternating quantities.

4 + 4 + 4 +