Second Year Examination of the
Three Year Degree Course, 2001

(Faculty of science)

PHYSICS

Paper-II

Electronics (Basic)

Time : 3 Hours [Maximum Marks :50]

Attempt any **five** questions,
selecting at least **one** question from each unit,
All questions carry equal marks.

UNIT-I

1. (a) What is Zener diode? Draw its volt-ampere characteristic curve and explain and explain the mechanism of Zener breakdown. 6

(b) A transistor, for which β=49, is connected in common base configuration. Find the change in collector current corresponding to 10mA change in emitter current. 4

2. (a) Draw the structural diagram of a JFET and explain its working. 5

(b) What is reverse saturation current in a transistor? Obtain an expression for collector current in terms of reverse saturation current for common emitter configuration. 5

UNIT-II

3. What are integrated circuits? What are their advantages over discrete circuits? Describe briefly with the help of suitable diagram various steps involved in fabrication of integrated circuits.2+2+6

4. (a) With the help of suitable diagram describe the procedure to fabricate an integrated circuit diode. State the limitations of integrated circuits technology. 4+2

(b) State the difference among different scales of integration used in integrated circuit technology. 4

UNIT-III

5. (a) Draw the circuit diagram of a bridge rectifier and explain its working. Write its metirs and demerits over a centre tap full wave rectifier. 4+2

(b) Write short note on a voltage regulated power supply. 4

6. (a) Draw the circuit diagram of a full wave rectifier with shunt capacitor filter. With the help of input and output waveform diagram explain its working. 5

(b) Define ripple factor. Prove that for a half wave rectifier the ripple factor is 121 percent. 2+3

UNIT-IV

7. (a) Describe experimental method for determining input and output resistance of an amplifier. 4

(b) What do you mean by biasing of a transistor? Draw the collector to base bias circuit of a transistor and derive expression for stability factor. 2+4

8. (a) Classify the amplifiers on the basis of operating conditions. 5

(b) A transistor used as an CE amplifier has h-parameters : $h_{ie}=800\Omega$, $h_{fe}=50$, $h_{oe}=80\times10^{-6}$ mho and $h_{re}=5.5\times10^{-4}$. It the load resistance used in this amplifier is $R_L=5\ k\Omega$ calculate its current gain, input resistance and voltage gain. 5

UNIT-V

9. (a) Draw the circuit diagram of a CE amplifier with current series feedback and obtain expression for its input impedance and voltage gain. 6

(b) An RC coupled transistor amplifier has mid-frequency voltage gain 100. The values of the lower and upper cut off frequencies for this amplifier are f_1=50 Hz and f_2=500 kHz. Calculate those frequencies at which voltage gain reduces to 80. 4

10. (a) Prove that in a multistage cascaded amplifier, on increasing the number of amplifier stages, its overall gain increase and bandwidth decreases. 5

(b) Write a short note on transformer coupled amplifier 5