(i) Printed Pages : **4**] Roll No. .....

(ii) Questions : **9**] **Sub. Code :** 3706

Exam. Code : 0472

M.Sc. 1st Semester Examination

1127

PHYSICS

(Electronics-I)

Paper : PHY-6005

Time : 3 Hours] **[Max. Marks : 60**

Note :– Attempt *five* questions in all, selecting *one* question from each Unit (Unit I to Unit IV). Question No. **9** of the Unit V is compulsory.

Unit–I

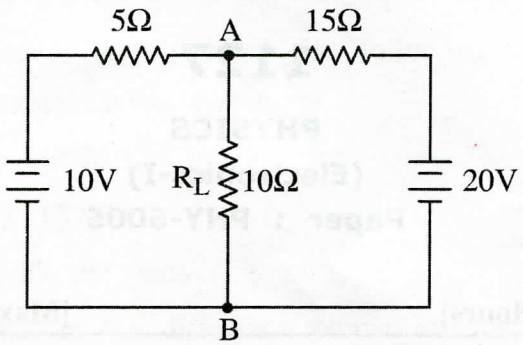
1. (a) Discuss the fabrication and qualitative description of the current flow at the junction.

   (b) What is the effect of the temperature and doping of carrier concentration on mobility ? 7,5

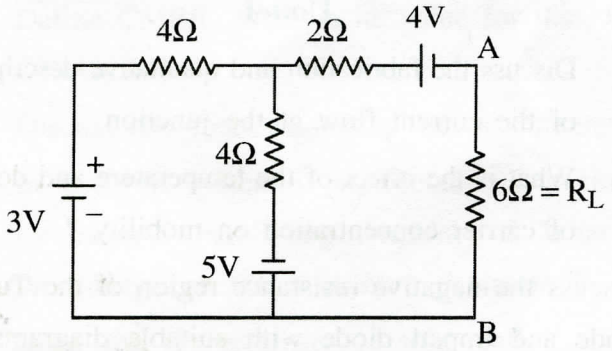
2. Discuss the negative resistance region of the Tunnel diode and impatt diode with suitable diagrams. 12

Unit–II

3. (a) Calculate the current flowing through 10 ohm resistance using Thevinin theorem in the dc circuit given below :



(b) Using the Norton's theorem, calculate the current flowing through 6 ohm resistance.



4. (a) Explain the working and circuit diagram for any *two* of the following filters :

(i) LP (Low Pass)

(ii) BP (Band Pass)

(iii) BR (Band Reject)

(b) Discuss the transmission matrices for the two port network. 8,4

Unit–III

5. (a) Discuss the operational amplifier as logarithmic and antilogarithmic amplifier.

(b) Discuss the IC operational amplifier with the internal structure. Discuss the some of parameters of the operation amplifier. 6,6

6. (a) Discuss the 555 timer for the monostable and astable multivibrator.

(b) Discuss the three open loop configuration of OP-AMP, when used in the high gain amplifier. 7,5

Unit–IV

7. (a) Discuss the silicon controlled rectifier (SCR).

(b) Discuss the generation and detection of SSB. 7,5

8. (a) Discuss in detail any *two* of the following digital modulation scheme :

   (i) ASK

   (ii) FSK

   (iii) PSK

   (b) Discuss any *one* of the following mobile communication system :

   (i) FDMA

   (ii) CDMA

9. Attempt all the parts :

   (a) What is the difference ohmic and rectifying contacts ?

   (b) What is the difference between active and passive filters ?

   (c) Define CMRR. What is its value for the ideal OP-AMP ?

   (d) Discuss the operational amplifier as integrator.

   (e) In any FM system if m_f becomes four times by halving modulating frequency ? What is the change on the maximum deviation ?

   (f) Draw the characteristic of solar cell. 6×2