Exam. Code : 103205

Subject Code : 8822

B.A./B.Sc. 5th Semester (Old Sylb. 2018)

PHYSICS

Paper—B (Electronics)

Time Allowed—3 Hours]   [Maximum Marks—35

Note :— Section A is compulsory. Attempt **one** question from Sections B, C, D and E. All questions carry equal marks.

SECTION—A

1. (a) What is the need of doping a pure semiconductor ?

    (b) What are the disadvantages of a half wave rectifier ?

    (c) Why is *CE* configuration most widely used in amplifiers ?

    (d) Why *FET* is called a unipolar device ?

    (e) What is the effect of negative feedback on voltage gain of amplifier ?

    (f) Why at least three *RC* sections are used in Phase shift oscillator ?

    (g) What is the effect of forward and reverse bias on depletion region ?

SECTION—B

2. Explain the working of forward biased and reverse biased *p-n* junction diode using the energy band diagram.

OR

3. Explain the working of a bridge rectifier. What is its ripple factor, efficiency and peak inverse voltage ?

SECTION—C

4. Describe the input and output static characteristics of a *CE npn* transistor. Explain the active, saturation and cut off regions. What is Early Effect ?

OR

5. What are the different types of *MOSFET's* ? Explain with a neat sketch the working of a *p-channel* enhancement type *MOSFET*.

SECTION—D

6. (a) Explain how negative feedback decreases the non linear distortion of an amplifier.

   (b) Show that negative feedback improves the gain stability of an amplifier.

OR

7. Draw the low frequency *h* parameters equivalent circuit of a *CE* transistor amplifier. Derive expression for input resistance, output resistance, current gain, voltage gain and power gain.

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SECTION—E

8. Describe the operation from the circuit diagram of a tuned collector oscillator. Derive the condition for sustained oscillations.

OR

9. Determine the frequency of oscillations and condition for sustained oscillations in Hartley oscillator.