M.Sc. (Physics) (NEP Pattern) Semester-I

NEP-233 / 01MSCPH1 - DSC Paper-I - Semiconductor Physics and Devices

P. Pages : 2 **GUG/S/25/15134**

Time : Three Hours * 2 7 7 8 * Max. Marks : 80

Either:

1. a) Explain construction, working Characteristics of Unijunction Transistor (UJT). **8**

b) Explain the working of N-channel JFET. Discuss the output characteristics of N-channel JFET in details. **8**

OR

e) Explain the working of LED and photo-diode. **8**

f) Explain construction and working of SCR.. **8**

Either:

2. a) What is Oscillator? Explain the Colpitts Oscillators with diagram in detailed. **8**

b) Explain Transformer-Coupled amplifier and its frequency response graph. What are the advantages of it? **8**

OR

e) Explain the construction of Hartley Oscillator and find the expression for frequency of Oscillator. **8**

f) Explain construction of Bipolar Junction Transistor (BJT). Discuss the input and output characteristics of CB connection. **8**

Either:

3. a) Explain working of Op-Amp as integrator and differentiator. **8**

b) What is subtractor? Give truth table and draw the circuit diagrams of half and full subtractor. **8**

OR

e) What are the types of multivibrators? Explain the construction and working of bistable multivibrator. **8**

f) How the inverting and non-inverting configurations are useful as summing, scaling and averaging amplifiers. **8**

Either:

4. a) What are magnetrons? Explain the principle of operation of magnetrons? **8**

b) Explain the construction and working of IMPATT and TRAPATT diode. **8**

OR

e) Discuss the Klystrons. Explain basic principles of two cavity klystrons and reflex klystrons. **8**

f) Explain working of Helix travelling wave tube. **8**

5. Attempt all the following questions.

a) Explain the working of n-channel enhancement MOSFET. **4**

b) Discuss the three basic logic gates. **4**

c) Explain the use of Op-Amp as subtractor. **4**

d) Explain velocity modulation. **4**

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