

PHY-504
Semiconductor Devices, Analog and
Digital Electronics

M.Sc. PHYSICS (MSCPHY-12/13/16/17)

First Year, Examination-2019

Time: 3 Hours

Max. Marks: 80

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Note:- This paper is of Eighty (80) marks divided into two (02) Section A and B. Attempt the question contained in these sections according to the detailed instructions given therein.

Section-A

(Long Answer Type Question)

Note:- Section - A contains five (05) long answer-type questions of fifteen (15) marks each. Learners are required to answer any three (03) questions only. **(3×15=45)**

1. Discuss the principles of negative feedback in amplifier's with neat diagram.

2. Describe the function of an operational amplifier as.
 - (i) an adder
 - (ii) an integrator
 - (iii) a differentiator
3. Discuss 4 : 1 multiplexer.
4. Draw a circuit diagram of EX – OR gate and explain its working with truth table at different stages.
5. How is an RS flip – flop converted into a JK flip – flop? Give its truth table and explain how it is obtained.

Section-B

(Short Answer Type Question)

Note:- Section-B contains eight (08) short answer type questions of seven (07) marks each. Learners are required to answer any five (05) questions only. **(5×7=35)**

1. What do you mean by Semiconductor? Define with examples the intrinsic and extrinsic semiconductors?
2. What is a power supply? Mention its various components and their role.

3. Explain the rules for binary multiplication and division.
4. Discuss postulates and theorem of Boolean algebra.
5. Find the decimal equivalent of
 - (i) 10011
 - (ii) 101.1101
6. Describe the principle of oscillators and their classification.
7. What is meant by frequency compensation in an operational amplifier?
8. List the characteristics of an ideal operational amplifier.
