

**Total No. of Pages : 2**

**Total No. of Questions : 11**

**M.Sc.(Physics) (2018 Batch) (Sem.-1)**

# ELECTRONICS

**Subject Code : MSPH-414-18**

**Paper ID : [75125]**

**Time : 3 Hrs.**

**Max. Marks : 70**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **SEVEN** questions carrying **FIVE** marks each and students have to attempt any **SIX** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

## SECTION-A

**1. Answer briefly :**

- How does a diode work as a switch?
- On what principle does a tunnel diode work?
- Explain the operation of NOR gate.
- Differentiate between DIAC and TRIAC.
- Why the temperature coefficient of resistance of a semiconductor is negative while that of a metal is positive?
- What do you mean by shift register?
- Convert 7493 into a 4-bit DOWN counter.
- What is de-multiplexer?
- State the principle of light emitting diode.
- What do you mean by ROM?

### SECTION-B

2. Discuss the working of Zener diode and its applications.
3. Design a 100 kHz, 60% duty cycle square wave generator using 555.
4. Design S-R latch using two 2-input NOR gates.
5. What do you mean by Boolean algebra? Write various rules applicable in this algebra.
6. Design a decade counter to count in excess-3 code sequence. Use minimum number of J-K flip-flops.
7. A D/A converter has a full scale analog output of 10V and accepts six binary bits as inputs. Find the input voltage corresponding to each analog step.
8. Describe the working of Static and Dynamic MOS RAM.

### SECTION-C

9. Discuss the working of Thyristor. Describe the different applications of Thyristors in detail.
10. Describe the functioning of OPAMP and its applications in detail.
11. Differentiate between asynchronous and synchronous counters. Discuss different counter design and their applications in detail.