



# RAN-1151

## Third year B.Sc. (Sem VI) Examination

March / April - 2019

### Physics : Paper - X

#### सूचना : / Instructions

नीचे दृशविले निशानीवाणी विगतो उत्तरवली पर अवश्य लभवी.  
Fill up strictly the details of signs on your answer book

Name of the Examination:

Third year B.Sc. (Sem VI)

Name of the Subject :

Physics : Paper - X

Subject Code No.:

1

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Seat No.:

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Student's Signature

#### Instruction:

1. Draw neat diagrams wherever necessary.
2. Symbols used in the paper have their usual meaning.
3. Figures to the right indicate full marks of the question.
4. Non programmable scientific calculators may be used.

#### Q1 1. Answer the following questions in brief:

08

- (1) What is meant by “exhaust pressure” and “attainable pressure” in vacuum pumps?
- (2) To what value does the pumping speed approaches when pressure in pump approaches attainable pressure?
- (3) What normally is the range of fore-vacuum required for working of diffusion pumps?
- (4) The scale in McLeod gauge is kept non linear for better accuracy. Why?
- (5) What is the difference between combinational and sequential logic circuits?
- (6) Why do we need to clock a flip-flop?
- (7) Draw pin diagram of IC DAC 0800 for digital to analog converter.
- (8) Give truth table for a NAND RS Flip-Flop.

#### Q2 (a) Attempt any one of the following in detail:

10

- (1) What do you mean by a vacuum pump? Describe construction and working of Gaede’s Rotary Oil Pump in detail. Discuss its advantages and limitations.

(2) What do you mean by a pressure gauge? Describe construction and working of Pirani Gauge in detail. Discuss its merits and drawbacks.

(b) **Attempt any one of the following:** 04

(1) Give account of (i) chemical process of gettering and (ii) de-gassing process as pressure reducing methods.

(2) State four points showing advantages of Knudsen Gauge over others?

**Q3 (a) Attempt any one of the following in detail:** 10

(1) State importance of encoder and decoder circuits in a digital system. Discuss design and operation of encoder and decoder circuits in detail.

(2) What are counters? Explain operation of 4-bit ripple up-counters and down-counters in with necessary block diagrams and truth tables.

(b) **Attempt any one of the following:** 04

(1) Draw circuit of master slave JK flip-flop. Explain its operation.

(2) Draw circuit of 1 to 4 demultiplexer using logic gates. Explain its operation.

**Q4 Write detailed note on any two of the following:** 14

(1) Pumping speed and its significance.

(2) Ionization Gauge.

(3) Digital comparators.

(4) Master slave JK flip-flop.

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