

28/11/18 (Morning)

**This question paper contains 3 printed pages.**

Your Roll No. ....

**Sl. No. of Ques. Paper: 307**

**I**

**Unique Paper Code : 32223904**

**Name of Paper : Basic Instrumentation Skills**

**Name of Course : B.Sc. (Prog.) Physics : SEC**

**Semester : V**

**Duration : 3 hours**

**Maximum Marks : 50**

*(Write your Roll No. on the top immediately  
on receipt of this question paper.)*

**Attempt five questions in all, including**

**Q. No. 1 which is compulsory.**

**All questions carry equal marks.**

**1. Attempt any five of the following:**

- (a) Two resistors  $R_1=36\Omega\pm5\%$  and  $R_2=75\Omega\pm5\%$  are connected in series. Find the total resistance.
- (b) What is the function of delay line in CRO?
- (c) What is advantage of using digital instruments over analog instruments?
- (d) What is the significance of Lissajous pattern?
- (e) Write two advantages of DSO over CRO.
- (f) An ammeter of 0–25 A range has a guaranteed accuracy of 1% of full scale reading. The current measured is 5 A. What is the limiting error?

P. T.O.



- (g) Why is the use of Maxwell's bridge limited to the measurement of medium Q coils (i.e.,  $1 < Q < 10$ )?  
5 × 2 = 10
2. (a) Explain what is precision and sensitivity of an instrument. 5
- (b) For a digital multimeter explain the principles of measurement of dc voltage and dc current. 5
3. (a) What is the advantage of electronic voltmeter over conventional voltmeter? 5
- (b) Draw a circuit diagram to show how a PMMC instrument can be used as an ac ammeter. Explain its' working. 5
4. (a) Draw the block diagram of basic CRO components. 5
- (b) With the help of diagram, explain the front panel controls of a DSO/CRO. 5
5. (a) Explain signal generator with the help of block diagram. 5
- (b) What is wave analyser? Explain it using an LC circuit. 5
6. (a) Explain the working principles of basic RLC bridge. 5
- (b) What is Q-factor of a circuit? Explain it using a LR circuit. 5

7. (a) What is gating error and time base error in frequency counters? Explain. 5
- (b) Explain the loading effect of a multimeter while measuring voltage across a low resistance and /or high resistance. 5