

**2023/TDC(CBCS)/ODD/SEM/  
PHSSEC-501T/160**

**TDC (CBCS) Odd Semester Exam., 2023**

**PHYSICS**

**( 5th Semester )**

Course No. : PHSSEC-501T

**( Basic Instrumentation )**

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

**SECTION—A**

Answer *fifteen* questions, selecting any *three* from  
each Unit as directed :  $1 \times 15 = 15$

**UNIT—I**

1. What is the difference between precision and accuracy of measurement?
2. What is loading effect?

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3. Which is a low resistance device—ammeter or voltmeter?
4. What is relative error in measurements?

UNIT—II

5. What is the main circuit element of an amplifier?
6. What do you mean by efficiency of a rectifier circuit?
7. Electronic voltmeters are designed to measure
  - (a) only very small voltage
  - (b) only very high voltage
  - (c) both very small and high voltages( Choose the correct option )
8. The input impedance of an electronic voltmeter is
  - (a) low
  - (b) high
  - (c) medium
  - (d) zero

( Choose the correct option )

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UNIT—III

9. CRO is used for the measurement of
  - (a) AC as well as DC current
  - (b) AC current only
  - (c) DC current only( Choose the correct option )
10. A CRO cannot be used in transmission lines.  
( Write True or False )
11. Rays emitted by a cathode-ray tube are
  - (a) lights
  - (b) radiations
  - (c) signals
  - (d) electrons( Choose the correct option )

12. What is an electron gun?

UNIT—IV

13. What is a Q-meter?
14. What is a signal generator?

15. In a series  $R-L-C$  circuit operating above the resonant frequency, the current
- (a) lags the applied voltage
  - (b) leads the applied voltage
  - (c) is in phase with the applied voltage
- ( Choose the correct option )
16. Which bridge is used for the measurement of inductance?

UNIT—V

17. What is the basic difference between analog and digital instruments?
18. What is frequency counter?
19. What do you mean by resolution of a multimeter?
20. What is timebase stability?

SECTION—B

Answer *five* questions, selecting *one* from each  
Unit : 2×5=10

UNIT—I

21. Write two causes of poor precision in scientific measurements.

22. What is absolute error? Give one example of absolute error.

UNIT—II

23. Draw the block diagram of AC multivoltmeter.
24. What are the differences between rectifier and amplifier?

UNIT—III

25. Which two CRO controls can be used together to obtain sharp and fine display pattern?
26. Draw the block diagram of a digital storage oscilloscope.

UNIT—IV

27. Write the difference between a function generator and a signal generator.
28. What is distortion factor? How is it measured by a distortion factor meter?

UNIT—V

29. Name the basic building block of digital multimeter.
30. Write two characteristics of a digital meter.

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SECTION—C

Answer *five* questions, selecting *one* from each  
Unit :  $5 \times 5 = 25$

UNIT—I

31. Explain the principles of measurements of AC voltage and AC current with the help of multimeter.
32. Explain the various types of errors in measurements.

UNIT—II

33. Explain, with block diagram, the principles of voltage measurement by an electronic voltmeter.
34. Describe the working of an amplifier-rectifier type AC multivoltmeter.

UNIT—III

35. Briefly explain the use of CRO for the measurement of DC voltage and AC frequency.
36. Explain the four basic parts of CRT.

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( Continued )

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UNIT—IV

37. Explain the working principle of a digital LCR bridge.
38. Draw a labelled block diagram of a pulse generator and state its function.

UNIT—V

39. Discuss the working principle of time interval and period measurement using universal counter.
40. Explain how time period and frequency measurement are done by a frequency counter.

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