



RAN - 2103000205030065

RAN-2103000205030065

B.Sc. (Sem. V) Examination October - 2023

Physics - Elective : Paper - III

Measurement and Instrumentation - I

[Total Marks: 50

सूचना : / Instructions

(१)

नीचे दशविवेक निशानीवाणी विगतो उत्तरवली पर अवश्य लपववी.

Fill up strictly the details of signs on your answer book

Name of the Examination:

B.Sc. (Sem. V)

Name of the Subject :

Physics - Elective : Paper - III
Measurement and Instrumentation - I

Subject Code No.: 2103000205030065

Seat No.:

--	--	--	--	--	--

Student's Signature

- (2) Draw neat diagrams wherever necessary.
- (3) Symbols used in the paper have their usual meaning.
- (4) Figures to the right indicate full marks of the question.
- (5) Scientific calculator may be used.

Q-1 Answer the following questions in brief:

[10]

- (1) Mention the wavelength of visible light in nm range.
- (2) Define point source.
- (3) Write the unit of solid angle.
- (4) Mention the name of thermal sansar
- (5) In electronic DC voltmeter with direct coupled amplifier the Output at FET usually directly coupled to input at BJT/FET/SCR
Mention one of them
- (6) One technique for amplifying direct currents and relatively Low frequency alternating currents is called _____
- (7) Write any two disadvantages of VTVM.
- (8) Mention atleast three uses of CRO
- (9) Write function of transducer

(10) An aquadag is used in a CRO to collect _____.

Q. 2 (a) Attempt any one of the following in detail: (7)

- (1) Explain the terms related to photometry
- (2) Explain the terms related to Radiometry

(b) Attempt any one of the following: (3)

- (1) Determine the threshold wavelength in the case of cesium surface for its work function is 1.8eV
 $h = 6.63 \times 10^{-34} \text{ js C} = 0.299 \times 10^9 \text{ m/s}$, $e = 1.6 \times 10^{-19} \text{ c}$
- (2) Explain photodiode

Q. 3 (a) Attempt any one of the following in detail: (7)

- (1) Write the full form of VTVM and also write the advantages & disadvantages of VTVM
- (2) Explain the chopper amplifier type voltmeter using photodiode

(b) Attempt any one of the following: (3)

- (1) What is the differential amplifier using FET device draw the circuit diagram & explain it
- (2) The electronic voltmeter has $R_s = 1000\text{K}\Omega$ $r_d = 100\text{k}\Omega$ $g_m = 0.0057 \text{ mho}$
A PMMC ammeter with an internal resistance of 50Ω , is used as the detector, if the input voltage is 1V find the approximate value of current through the meter

Q. 4 (a) Attempt any one of the following in detail: (7)

- (1) Write the full form of CRO and derive the formula
 $D = LId Ed / 2dEa$
- (2) Draw the internal structure of a CRT & explain electron gun assembly

(b) Attempt any one of the following: (3)

- (1) An electrically deflected CRT has a final anode voltage of 2000V and parallel deflecting plates 1.5 cm long and 5 mm apart, if the screen is 50 cm from the center of deflecting plates find
 - (i) The deflection sensitivity of the tube
 - (ii) The deflection factor of tube

- (2) Describe the following any two
 - (i) Astigmatism control
 - (ii) Blanking circuit
 - (iii) Z-axis modulation
 - (iv) sources of synchronization

Q. 5 (a) Attempt any one of the following in detail: (7)

- (1) Explain the potentiometer in detail
- (2) Mention the following types of error for a transducer
 - (i) scale error
 - (ii) Dynamic error

(b) Attempt any one of the following (3)

- (1) Write the resistive transducer in short
 - (2) Explain about wire wound potentiometer & none wire wound Potentiometer
-