Seat No. : _____

AG-122

April-2025

B.Sc., Sem.-VI

CC-311(A) : Physics

(Experimental & Measurement Techniques)

Time : 2:30 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.

(2) Symbols have their usual meaning.

1. (A) Define calibration and write a note on systematic error. **7**

OR

(A) Discuss the cycle of experimental science. **7**

1. (B) Ten repeated measurements of light intensity are : **7**

10.3, 12.6, 11.5, 14.3, 15.2, 13.6, 12.3, 14.5, 12.9, 10.5 W/m^2.

Calculate : (i) average value (ii) mean deviation (iii) sample variance and (iv) standard deviation.

OR

(B) Discuss mathematical description of binomial and Poission distribution. **7**

2. (A) Name atleast six transducer characteristics and discuss any four of them. **7**

OR

(A) Write a note on resistive temperature detectors (RTDs). **7**

2. (B) State the Stefan-Boltzmann law and discuss infrared pyrometers. **7**

OR

(B) Discuss thermocouples in detail. **7**

3. (A) Discuss the range of accessible pressures in vacuum practice. **7**

OR

(A) Discuss various characteristics of vacuum. **7**

3. (B) Explain Pirani gauge and Penning cold cathode gauge. **7**

OR

(B) Discuss mechanical rotary pump and multistage diffusion pump with diagrams. **7**

4. (A) Write a note on random error. **7**

OR

(A) Discuss thermistors in detail. **7**

4. (B) Explain the technique of disappearing filament optical pyrometers. **7**

OR

(B) Discuss applications of vacuum. **7**

5. Do as directed : (Attempt any **seven** questions – each question carries **2** marks) **14**

(1) Find number of significant figure in 3.012.

(2) Define error.

(3) What is standard deviation σ ?

(4) Write an expression for variance of the sample mean S_m^2.

(5) What is temperature ?

(6) Define transducer.

(7) Which law is used to define temperature ?

(8) What is Seebeck effect ?

(9) 1 mbar = _____ Pa.

(10) Write equation for pumping speed S for a vacuum system.

(11) What is pressure range of mechanical rotary pump ?

(12) What is ideal gas ?

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April-2025

B.Sc., Sem.-VI

CC-311(B) : Physics

(Instrumentation)

Time : 2:30 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.

(2) Symbols used have their own meaning.

1. Explain about LVDT in detail. Also discuss about temperature transducer. (Thermistor type). **14**

OR

1. Describe the working of Piezoelectric transducer using necessary figure. Also discuss about P-N junction photo diode. **14**

2. Discuss the characteristics of moving coil meter movement. Also discuss about multirange DC voltmeter & its loading effect. **14**

OR

2. Explain about Rectifier type A.C. meter. Also give comparison of VOM & VTVM. **14**

3. Discuss about Modern Lab. Signal generator. Also discuss sine & square wave generator. **14**

OR

3. Explain about Pulse generator & Sweep generator in detail. **14**

4. What is strain gauge ? Explain the construction & working of bonded strain gauge. State the advantages of wire strain gauge. **14**

OR

4. With a suitable diagram, explain how can a basic moving galvanometer be used to measure different electrical quantities. Derive the necessary equations to convert a moving coil meter into (i) ammeter (ii) voltmeter. **14**

5. Attempt any **seven** out of **twelve** : **14**

(1) Define duty cycle of a given pulse wave.

(2) What is the difference between photovoltic cell & solar cell ?

(3) What do you mean by a time constant of a thermister ?

(4) What do you mean by a loading effect of a voltmeter ?

(5) What is the basic difference between active & passive transducers ?

(6) In $R_t = R_o (1 + \alpha t)$, what is "α" ?

(7) Which meter measure current directly ?

(8) Input resistance of a voltmeter should be _____ & ammeter should be _____.

(9) Range of AF is _____.

(10) S/N ratio means ...

(11) In function generator frequency is controlled by _____ circuit.

(a) LR

(b) LC

(c) RF

(d) RCL

(12) For capacitor the following relation is valid (d = plate separation) :

(a) $c \propto d$

(b) $c \propto \frac{1}{d^2}$

(c) $c \propto \frac{1}{d}$

(d) $c \propto d^2$

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April-2025

B.Sc., Sem.-VI

CC-311(C) : Physics

(Visual Basic)

Time : 2:30 Hours] **[Max. Marks : 70**

1. (A) Write the note on Visual Basic Integrated Development Environment. **7**

OR

(A) Explain the Menu Bar of VB. **7**

1. (B) Explain the Tool Box in VB. **7**

OR

(B) Write the note on "The Project Explorer window". **7**

2. (A) Write short note on Loops control statements in VB. **7**

OR

(A) Write a VB script to print Even number from 1 to 50 and also find sum. **7**

2. (B) Write short note on if-then-else control statement in VB. **7**

OR

(B) Write short note on Select ...Case statement in VB. **7**

3. (A) State the difference between Explicit and Implicit declaration in VB. **7**

OR

(A) Write a VB script to print 10 to 99 numbers and also find sum of odd numbers. **7**

3. (B) State the differences between Local Variables and Static Variables. **7**

OR

(B) Explain File Menu in VB. **7**

4. (A) State the differences between List box & Combo box in VB. **7**

OR

(A) Write a VB script to print first 15 terms of Fibonacci sequence : **7**

1, 1, 2, 3, 5, 8, 13, ...

4. (B) Write note on Runtime error handling in VB. **7**

OR

(B) Write a VB script to calculate factorial of first 7 numbers. **7**

5. Short answer : (Any **seven**) **14**

(1) What is Default Project name in VB ?

(2) Write default Extension of VB Form.

(3) Which loop statement is used to repeat the process a number of times are fixed ?

(4) How do we change caption property ?

(5) Write syntax of print command.

(6) Write syntax of Inputbox command.

(7) Write shortcut key to cut in VB.

(8) Write shortcut key to paste in VB.

(9) How to change properties of TextBox ?

(10) How to declare a variable in VB ?

(11) Write the shortcut key for select all.