Seat No. : _____

AF-129

April-2023

B.Sc., Sem.-VI

CC-311 : Physics

(A : Experimental and Measurement Techniques)

Time : 2½ Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions are compulsory.
(2) The symbols have their usual meaning.

1. (A) Explain the briefly "Random Error". **7**

OR

Discuss about source of uncertainty. **7**

(B) In thermal rubber tube experiment, the value of an unknown temperature were found to be 2.11°C, 2.01°C, 2.12°C, 11.05°C and 2.40°C. Calculate mean value deviation and standard error in temperature. **7**

OR

Explain systematic errors arising form experimental design. **7**

2. (A) Explain the Poisson distribution function. **7**

OR

Explain Transducer characteristics :
(1) Accuracy (2) Resolution (3) Repeatability **7**

(B) Explain for transducer (1) Dead time (2) Rise time (3) Setting time **7**

OR

Write short note on Photo emissive detector. **7**

3. (A) Write short note on Infrared Pyrometer and Bolometer. **7**

OR

Write short note on Photo conductive detectors. **7**

(B) Write short note on Golay cell. **7**

OR

Write short note on Resistance Therometer. **7**

4. (A) Explain characteristics of Vacuum. **7**

OR

Explain how the capacitance gauge and Pirani gauge are useful for pressure. **7**

(B) Discuss in detail about Rotary pump and multistage diffusion pump. **7**

OR

Define the pumping speed of a vacuum pump. Obtain the equation of effecting pumping speed $Se = \frac{S_P \times C}{C + S_P}$ **7**

5. Give answer in short any **Seven** : **14**

(1) Give the unit of thermal conductivity and dimensional formula of thermal conductivity.

(2) What is accuracy ? Define probability.

(3) Two resistor of $R_1 = 600 \pm 4\ \Omega$ and $R_2 = 400 \pm 5\ \Omega$ are connected in series. Find percentage error in resistor.

(4) The resistance of form of $R(T) = A\ e^{E/KT}$, where A is constant, plot the graph $l_n\ R(T) \rightarrow \frac{1}{T}$.

(5) Give the unit of optical density. What is Hysteresis ?

(6) What is Seebeck effect ? What is mean free path ?

(7) Give full form of BJT & UJT.

(8) Write down formula of Binomial distribution function.

(9) What is the diffusion length in semiconductor ?

(10) 2.5 m bar = _____ torr.

(11) If the temperature coefficient of wire is $0.002\ °C^{-1}$ and resistance of wire at 0 °C is 200 Ω to find resistance of wire at 200 °C.

(12) Write down equation of Stefan Boltzman's law.

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Seat No. : _____

AF-129

April-2023

B.Sc., Sem.-VI

CC-311 : Physics

(B : Instrumentation)

Time : 2½ Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions are carrying equal marks.

(2) Symbols have their usual meaning.

(3) Number on the right side indicate marks.

1. (a) What are photoelectric transducers ? State different types of such transducers. Explain the construction and working of a solar cell and write its advantages and disadvantages. **8**

OR

Explain the principal, construction, working, advantage and disadvantage of bulk type photo conductivities cell. **8**

(b) What are the thermocouple ? Explain its construction and working principle. **6**

OR

Explain working and construction of resistive position transducer and resistive pressure transducer. **6**

2. (a) Give the comparison between VOM and VTVM. Explain the working of single tube VTVM using a neat circuit diagram. **7**

OR

What do you mean by electronic voltmeter ? Draw a neat circuit diagram of FETVM and explain its working. **7**

(b) Draw neat figure of the basic Meter Movement and write about the construction and principle of operation for its. **7**

OR

What are analog and digital meters ? Explain the working of the basic meter movements with the characteristic. Draw the circuits of basic meter movements as DC ammeter. DC voltmeter and ohmmeter. **7**

3. (a) What is signal generators ? Draw a neat schematic diagram of the conventional standard signal generator and explain in detail. **7**

OR

Describe the working of Laboratory square and pulse wave generator along with necessary diagram. **7**

(b) Draw the block diagram of sweep generator and explain it. **7**

OR

Draw the neat figure of AF sine and square wave generator and describe it. **7**

4. (a) What is Thermistor ? Explain the construction, response time, advantages and application of Thermistor. **7**

OR

Draw a diagram of Linear Variable Differential Transformer (LVDT) and explain the construction and working of LVDT. **7**

(b) Describe the following **three** characteristic of moving coil meter movements :

(i) Full-scale deflection current (I_m)

(ii) Internal resistance of the coil (R_m)

(iii) Sensitivity (S) **7**

OR

(b) (I) A 50 mA meter movement with an internal resistance of 1 kΩ is to be used as a dc voltmeter of range 50V, calculate the **3**

(i) Multiplier resistance required

(ii) Voltage multiplication

(II) Write a note on random noise generator. **4**

5. Answer the following questions in short (any **Seven**) : **14**

(1) What do you mean by force summing device in a strain gauge ?

(2) What do you mean by a time constant of a thermocouple ?

(3) Give three name of temperature transducer and write its applications.

(4) What is the piezoelectric effect ?

(5) Give three name of biological transducer.

(6) Write any two advantages of wire strain gauge.

(7) Draw the output voltage waveform of a half wave and full wave rectifier type AC meter.

(8) Define duty cycle.

(9) Calculate sensitivity of a 60 μA meter movement.

(10) Write any two comparison between VOM and VTVM.

(11) Write the difference between photovoltaic and photoconductive devices.

(12) Write any two applications of thermocouples.

Seat No. : _____

AF-129

April-2023

B.Sc., Sem.-VI
CC-311 : Physics
(C : Visual Basic)

Time : 2½ Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions are compulsory.
(2) The symbols have their usual meaning.

1. (a) Explain the importance of Visual Basic in Education. **7**

OR

Describe the project explorer in detail. **7**

(b) Write a VB script to print first 25 natural numbers, also find the sum of square. **7**

OR

Explain List box & Combo box in VB. **7**

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

OR

Explain Edit Menu in VB. **7**

(b) Write the difference between Explicit declaration and Implicit Declaration. **7**

OR

Write a VB script to prepare a simple arithmetic calculator. **7**

3. (a) Write the note on scope of variable in VB. **7**

OR

Explain types of loop control statements. **7**

(b) Write a VB script to calculate ${}^{n}P_{r}$. **7**

OR

Explain types of Errors in VB. **7**

4. (a) Explain the ToolBox windows. **7**

OR

Write the note on Label Properties. **7**

(b) Explain CommandButton controls in VB. **7**

OR

Write a VB script to print and sum of Odd number from 5 to 50. **7**

5. Short answer (any **Seven)** : **14**

(1) How to change Default Project name in VB ?

(2) Write the Syntax of Dim statement.

(3) Write syntax of print command.

(4) What do you mean by Boolean data type in VB ?

(5) How to change caption property ?

(6) What is string data type ?

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

(8) How to change properties of Label in VB ?

(9) Write syntax of Inputbox command.

(10) What is use of Text box ?

(11) Write the short cut key for select all.

(12) What is use of function key F1 in VB ?