22PHU412N / N20PHU12

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Fourth Semester)

Branch - **PHYSICS**

ELECTRONIC INSTRUMENTATION

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is a static characteristic of a measurement system? a) Accuracy b) Speed of response c) Lag d) Fidelity	K1	CO1
	2	Infer the type of error occurs due to imperfections in instrument design. a) Random error b) Systematic error c) Environmental error d) Gross error	K2	CO1
2	3	Which is used to verify the accuracy of a voltmeter? a) Ammeter b) Oscilloscope c) Calibration setup d) Thermistor	K1	CO2
	4	Relate the device in which Aryton shunt is used. a) DC voltmeters b) AC voltmeters c) Multimeters d) Multirange ammeters	K2	CO2
3	5	What is the basic principle of an oscilloscope? a) Magnetic deflection b) Inductive coupling c) Electrostatic deflection d) Resonance phenomenon	K1	CO3
	6	Show the heart of an oscilloscope. a) Transformer b) CRT c) Amplifier circuit d) Rectifier	K2	CO3
4	7	Which of the following is an active transducer? a) Thermocouple b) Potentiometer c) LVDT d) Strain gauge	K1	CO4
	8	Infer, how a piezoelectric transducer produces an output? a) Thermal energy b) Mechanical stress c) Electrostatic force d) Optical energy	K2	CO4
5	9	Find which can be monitored using Electroencephalography (EEG). a) Heart rhythm b) Blood circulation c) Brain activity d) Muscle activity	K1	CO5
	10	Relate the primary use of Phono-cardiography (PCG). a) Measuring blood pressure b) Monitoring lung function c) Detecting brain activity d) Recording heart sounds	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Infer dynamic characteristics of measuring instruments and explain any three.	K2	CO1
		(OR)		
	11.b.	Outline the significance of electrical standards in measurement systems.		
2	12.a.	Construct DC ammeter and explain its working principle with a suitable diagram.	K3	CO2
		(OR)		
	12.b.	Build an AC voltmeter using rectifiers and explain its working principle.		
3	13.a.	Construct the basic working principle of an oscilloscope with a block diagram.	K3	CO3
		(OR)		
	13.b.	Construct dual beam oscilloscope and explain its applications with advantages.		
4	14.a.	Distinguish active and passive transducers with examples.	K4	CO4
		(OR)		
	14.b.	Conclude the principle of a thermistor-based transducer and its applications.		
5	15.a.	Analyze the working principle of Phono-cardiography (PCG) and its applications.	K4	CO5
		(OR)		
	15.b.	Discover the working of a pacemaker and its energy requirements along with modes of operation.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Categorize the concept of measurement errors and discuss the techniques used to minimize them.	K4	CO1
2	17	Examine the calibration methods for an ohmmeter and why it is important in electrical measurements?	K4	CO2
3	18	Classify the various types of oscilloscopes and explain with their applications.	K4	CO3
4	19	Analyze the characteristics and advantages of resistive transducers.	K4	CO4
5	20	Simplify the principle, construction, and applications of Electroretinography (ERG).	K4	CO5

Z-Z-Z END