Sixth Semester B.Sc., Degree Examinations

May / June 2026

(Semester Scheme NEP 2021 onwards)

PHYSICS

Paper : VIII : NSF0520 : Electronic Instrumentation and Sensors

Time: 2 hrs.] [Max.Marks:60

Instructions to Students :

1. *The Students should legibly write Section number along with question numbers within the margin ONLY.*
2. *The answer without Section number and question numbers will not be valued.*
3. *Draw neat and labelled diagram wherever necessary.*
4. *Section I multiple Choice Questions should be answered in the first page of main answer book and same questions shall not be answered repeatedly.*
5. *Any identifications like marking, ticking, dots etc., in the options of MCQ on the question paper is strictly prohibited. Do not write anything (except register number) on the question paper*
6. *This question paper consists of four Sections.*
7. *Take necessary data from tables.*
8. *Symbols have their usual meaning.*
9. *Usage of scientific calculator is allowed.*

SECTION- I

I. *Select the most appropriate answer from options provided :* *10X 1= 10 Marks*

I-1) Passive transducers require

A) No power supply B) External power supply

C) Solar energy D) Mechanical energy only

I-2) The phase difference between the voltages in a three-phase system is

A) 60° B) 90°

C) 120° D) 180°

I-3) In a high pass filter, when frequency increases

A) Output decreases B) Output increases

C) Output becomes zero D) Output remains constant

Contd...2

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I-4) The most common active component used in active filters is

A) Diode B) Transistor

C) Operational Amplifier (Op-Amp) D) Transformer

I-5) LCD works on the principle of

A) Electromagnetic induction

B) Light modulation using liquid crystals

C) Photoelectric effect

D) Magnetic field

I-6) A Digital Storage Oscilloscope is mainly used to

A) Generate signals

B) Display and store electrical signals

C) Amplify signals

D) Produce DC voltage

I-7) Strain gauge measures

A) Pressure B) Strain

C) Temperature D) Velocity

I-8) 8) In Pulse Amplitude Modulation, the width of pulses is generally

A) Variable B) Constant

C) Increasing D) Decreasing

I-9) Piezoelectric transducer converts

A) Mechanical stress into electrical signal

B) Electrical into mechanical only

C) Heat into electricity

D) Light into electricity

I-10) The main advantage of a bridge rectifier is

A) Uses fewer diodes

B) Does not require a center-tapped transformer

C) Produces AC output

D) Requires high voltages

Contd...3

SECTION- II

II. ***Answer any FIVE of the following questions.*** ***5X 3= 15 Marks***

II-1) Explain the working of LC π-section filter using suitable circuit diagram.

II-2) Explain the working principle of a basic DC voltmeter for measuring potential difference.

II-3) Explain the basic principle of standard AF signal generator.

II-4) Write a note on types of frequency filters.

II-5) What are the advantages of Digital transmission over Analog transmission?

II-6) Write a note on Resistive Transducer.

II-7) Explain the Principle and working of Phototransistor.

II-8) What is Analog to Digital Converter? Write its application.

SECTION- III

III. ***Answer any THREE of the following questions.*** ***3X 5= 15 Marks***

III-1) What is DC power? Mention the characteristics of DC Power supply.

III-2) Explain the concept of single phase and three phase AC power supply.

III-3) Explain the construction and working of Light Emitting Diode (LED).

III-4) Explain the principle and working of Linear Variable Differential Transducer.

III-5) Design a wide band pass filter with F_1 = 100Hz, F_H 1KHz, and a pass band gain of 4 with C=0.01μF and calculate the value of Q for this filter.

SECTION- IV

IV. ***Answer the following:*** ***2X 10= 20 Marks***

IV-1) a) Using block diagram explain the construction and working of Cathode Ray Oscilloscope.

OR

b) What is Transducer? Explain their types and factors governing the selection of a Transducer.

IV-2) a) With neat diagram explain the construction and working of LCD. What are the advantages and applications in modern electronics?

OR

b) Explain the working of an Op-Amp-based High Pass Filter. Discuss its construction, working principle, frequency response and cutoff frequency formula.

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