Critically evaluate the net present value a
internal rate of return criteria for investme
appraisal. Do these criteria always lead
identical conclusion? 8+2=1

বিনিয়োগের যৌক্তিকতা নির্ধারণের জন্য নেট প্রেজেন্ট ভ্যা
এবং ইন্টারনাল রেট অফ রিটার্ন নিয়ম দুটি সমালোচনামুল
মূল্যায়ন করো। সব ক্ষেত্রেই কি এই দুটি নিয়ম একই সিদ্ধা
উপনীত হয়?

U.G. 6th Semester Examination - 2023

PHYSICS

[HONOURS]

Discipline Specific Elective (DSE)

Course Code : PHY-H-DSE-T-04

(Experimental Techniques)

Full Marks : 40 Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.
Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **five** questions: 2×5=10

a) Define systematic error and random error in connection with measurement.

b) What is S/N ratio and noise figure?

c) What are the thermal noise and shot noise?

d) What is electromagnetic interference? How can you protect your device against it?

e) What do you mean by static and the dynamic characteristics of measurement system?

f) What is the difference between transducer and sensor?

g) What is the difference between pirani gauge and penning gauge?

h) Write the working principle of turbo modular pump.

2. Answer any **two** questions: 5×2=10

a) Draw the block diagram of digital multimeter. Write the principles of measurement of I, V, C by using digital multimeter. 3+2

b) What is electrostatic shielding? Write two applications of electrostatic shielding. What are the methods of safety grounding? 1+2+2

c) What is Q-meter? Draw the circuit diagram and write its working operation. 1+2+2

d) You grow 15 crystals from a solution and measure the length of each crystal in millimeter. Here is your data:

9, 2, 5, 4, 12, 7, 8, 11, 9, 3, 7, 4, 12, 5, 4.

Calculate the mean, average deviation and standard deviation of the length of the crystals. Write the mathematical expression of Gaussian distribution function. 3+2

Answer any **two** questions: 10×2=20

a) Write short notes on (any **two**): 5×2=10

i) Temperature transducer

ii) Semiconductor type temperature sensors

iii) Inductance change transducer

b) i) Draw the simplified block diagram of RLC bridge and write its working principle.

ii) Draw the schematic diagram of Diffusion pump and explain how it works. 5+5

c) i) What is the working principle of Pirani pressure gauge?

ii) What are the advantages and disadvantages of Pirani gauge?

iii) With the help of diagram, write the working process of Scintillation detector. 3+4+3

d) i) What are the characteristics of vacuum? Write the expression of mean free path of a gas molecule in vacuum. Write two applications of vacuum system.

ii) In a signal what is transfer function of 1st and 2nd order system and write its standard form.

iii) Write two advantages of Electrical transducer. (2+1+2)+3+2
