Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – June 2023

Programme Name: B Sc (NS)

Semester: _II_____

Subject Code: UG21T5202

Subject Name: APPLIED PHYSICS & ELECTRICITY

Date: 26.05.2023 Max Marks: 70

Duration: 03 Hrs Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.

(ii) Options, if any, are specified in respective section.

(iii) Scientific Calculator is permitted.

(iv) (Norrie's Table, Nautical Almanac, Hindship Hyd. Particulars, Weather coding booklet, Tide Tables, permitted as per the subject concerned)

(v) (World Map, Tidal curve, Radar Plotting sheets, Charts, Illumination range curve chart will be supplied by the Examination Centre)

Section A

1.Thermistor has the property of

a) no resistance
b) positive temperature coefficient
c) negative temperature coefficient
d) zero temperature coefficient.

2. Which of the following states that an emf is induced whenever there is a change in the magnetic field linked with electric circuits?

a. Lenz's Law
b. Ohm's Law
c. Faraday's Law of Electromagnetic Induction
d. None of the above

3. What is the frequency of ac mains in India?

a. 120 Hz
b. 60 Hz

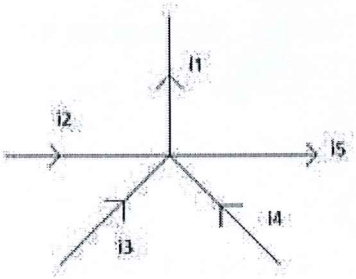
c. 50 Hz
d. 30 Hz

4.In Alternating current, the direction and magnitude of the current varies
a) Randomly
b) Periodically
c) exponentially
d) do not vary.

5. A bridge circuit is used for the measurement of which of the following components?
a) Resistance, capacitance, and inductance
b) Diode, triode, and thyristor
c) Transistor, thermistor, and antenna
d) LED, op amp, and transducer

6. What is applied to the two opposite junctions of a bridge circuit?
a) source of voltage
b) source of current
c) source of power
d) source of impedance

7. Relation between currents according to KCL is



a) $i_1=i_2=i_3=i_4=i_5$
b) $i_1+i_4+i_3=i_5+i_2$
c) $i_1-i_5=i_2-i_3-i_4$
d) $i_1+i_5=i_2+i_3+i_4$

8. The commutator segments are connected to the armature conductors by means of
a) copper legs
b) resistance wires
c) insulation pads
d) brazing.

9. Armature reaction in a generator results in

a) Demagnetization of leading pole tip and magnetization of trailing pole tip
b) Demagnetization of trailing pole tip and magnetization of leading pole tip
c) Demagnetizing the center of all poles

d) Magnetizing the center of all poles

10. In an experiment, it is found that the experimental value is very close to actual value, hence the experimental value can be called _____
    a) Accurate
    b) Precise
    c) Suitable
    d) Mean

Section B

5×2=10

Five Questions of 02 Marks each

11. Define Coupling Coefficient.
12. Define quality factor of resonance in series RLC circuit.
13. Write any two applications of Wheatstone bridge.
14. What are the factors that cause heating effect of electric current?
15. Write any four types of temperature measurement sensors.

Section C

Seven Questions of 10 Marks each of which any 05 questions are to be answered.

16.	(a)	Explain Electromagnetic induction	7M
	(b)	Explain Lenz's law	3M
17.	(a)	Compare AC and DC Voltages	5M
	(b)	Write electrostatic precautions for "Electrostatic charge by petroleum" ship board application?	5M
18.	(a)	Explain Kirchhoff laws with a diagram?	5M
	(b)	Explain active and passive elements in a network	5M
19.		Explain principal of working of induction motor and its applications?	10M
20.		Explain heating effect of current and uses of fuses?	10M
21.		Explain with a diagram about Wheatstone bridge, its principal of operation, derivation for finding an unknown resistance.	10M
22.		Write about the following A. Precision B. Fluid flow C. Thermistor D. Sound level meter	(2.5 x 4 = 10)