

Indian Maritime University
(A Central University, Govt of India)
Supplementary Examinations – March/April 2024
Programme Name: B Sc (NS)
Semester: II
Subject Code: UG21T5202
Subject Name: Applied Physics & Electricity

Date: 11/03/2024

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.

Section A

Ten MCQs of 01 Mark each – Choose the correct answer

1. 1. What will be the resistance of 10 resistors of 10 ohm is connected in series
(A) 100
(B) 1
(C) 0.1
(D) 10
2. A Passive element in a circuit is one which
(A) Receives energy
(B) Supplies energy
(C) Both supplies and receives energy
(D) None
3. The resonant frequency of R-L-C circuit depends on a series resonant circuit, =
(A) R
(B) L
(C) C
(D) R, L and C
4. Alternator working principal is
(A) Electromagnetic induction
(B) Self-inductance

- (C) Mutual inductance
- (D) Back EMF

5. The Rating of a fuse wire is always expressed in

- (A) Amperes-hrs
- (B) Ampere-volts
- (C) kWh
- (D) Amperes.

6. What does emf stand for?

- a) Electronic magnetic force
- b) Electromotive force
- c) Electromagnetic force
- d) Electromated force

7. The direction of induced e.m.f. can be found by

- a) Laplace's law
- b) Lenz's law
- c) Fleming's right hand rule
- d) All of the above

8. The unit of frequency is

- a) Hertz
- b) Hertz/cycle
- c) Cycle
- d) cycle/sec

9. In liquid in steel bulb thermometer, which liquid can be used for measuring temperature up to 6000°C ?

- a) Mercury
- b) Ether
- c) Water
- d) None of the mentioned

10. Condition for resonant Frequency

- a) $X_L = X_C$
- b) $X_L > X_C$
- c) $X_L < X_C$
- d) None

Section B

Five Questions of 02 Marks each. SHORT ANSWER TYPE QUESTIONS

11. Explain Mutual Induced EMF
12. Define Q factor of a series circuit
13. Explain resonance frequency in RLC circuit
14. Define R.M.S. value of an AC
15. Define Power factor and quality factor

Section C

Answer five out of seven questions. (10 Marks Each)

16. a) State the faraday's laws of electromagnetic induction (5 Marks)
b) Derive an expression for self and Mutual Inductance? (5 Marks)
17. a) Define form factor and peak factor of AC. (5 Marks)
b) A coil takes a current of 6 A when connected to a 24-V d.c. supply. To obtain the same current with a 50-Hz a.c. supply, the voltage required was 30 V. Calculate (i) the inductance of the coil (ii) the power factor of the coil. (5 Marks)
18. Explain with a neat sketch, principle, construction and working of AC generator. (10 marks)
19. a) Explain Kirchhoff laws with a diagram? (5 Marks)
b) Explain active and passive elements in a network (5 Marks)
20. a) Describe heating effect of current and advantages of fuses -(5 Marks)
b) With an example explain the "Variation of thermo EMF with temperature variation" -(5Marks)
21. a) Explain about thermistor and its applications on board a vessel - (5 Marks)
b) Explain about sound level meter - (5 Marks)
22. Explain the following in detail
 - a) Coupling coefficient -3Marks
 - b) Series RLC circuit -3Marks
 - c) Dc shunt series motors and its applications -4Marks

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