7370

Register
Number

I/II Semester Diploma Examination, February/March-2023

APPLIED SCIENCE

Time : 3 Hours]

[Max. Marks : 100

Instructions : (i) Answer any **ten** sub-questions from Section – **A**.

(ii) Answer any **ten** sub-questions from Section – **B**.

(iii) Answer any **five** sub-questions from Section – **C**.

SECTION – A

1. (a) List supplementary units in SI systems.   2

(b) Define Resultant of a force.   2

2. (a) State Lami's theorem.   2

(b) Define like and unlike parallel forces.   2

3. (a) State Hook's Law.   2

(b) Define Capillarity.   2

(c) Write any two applications of viscosity.   2

4. (a) State Boyle's Law.   2

(b) Define specific heat of a gas at Constant Pressure (CP).   2

5. (a) Define wave motion.   2

(b) Write any two applications of heats.   2

[Turn over

6. (a) Write two advantages of nano-technology.

    (b) Define optical fibre.

7. (a) Define electrolysis.

    (b) State Faraday's 1st law of electrolysis.

SECTION – B

8. (a) Write seven basic units in SI system.

    (b) Draw a neat diagram of Vernier callipers and label its parts.

9. (a) Derive an expression for pressure at a point in a liquid at rest.

    (b) Define compressibility and factor of safety. Write the SI unit of stress.

    (c) Define surface tension. Mention any three factors affecting on surface tension.

10. (a) Write any five differences between heat and temperature.

    (b) Compare the three modes of transmission of heat with an example.

11. (a) Distinguish between longitudinal and transverse wave (write any 5).

    (b) What is stationary wave ? Mention any three characteristics of stationary waves.

12. (a) Write any five advantages of LASER.

    (b) Write the block diagram of communication system.

13. (a) Write any five postulates of Arrhenius theory of electrolytic dissociation.

    (b) Write any five preventive methods of corrosion.

14. (a) Write the differences between strong electrolyte and weak electrolyte with an example.

    (b) Define pH of a solution. Write any three industrial applications of pH of solution.

SECTION – C

(a)   Derive an expression for magnitude of resultant of two forces acting at a point.   6

(b)   Describe an experiment to determine the surface tension of water by capillary rise method.   6

(a)   Define perfect gas and Real gas. With usual notations prove that PV = nRT.   6

(b)   Derive an expression for displacement of a particle executing SHM.   6

(a)   Describe an experiment to find the unknown frequency of the given tuning fork using sonometer by comparison method.   6

(b)   The frequency of sonometer wire is doubled when the tension is increased by 12 kg weight. Find original tension.   6

(a)   What is the principle of optical fibre ? Write four applications of optical fibre.   6

(b)   What is battery ? Write the applications of batteries.   6

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7194

Register Number

CONCEPTS OF ELECTRICAL & ELECTRONIC ENGINEERING

Time : 3 Hours]

[Max. Marks : 100

Instructions : (i) Answer any **six** questions from Part – **A**. Each question carries **5** marks.

(ii) Answer any **seven** full questions from Part – **B**. Each question carries **10** marks.

PART – A

1. State and explain Faraday's laws of Electromagnetic induction. 5

2. Define Electric Current, Voltage & Resistance. Write the SI units. 5

3. List ideal characteristics of operational amplifier. 5

4. State and explain Kirchoff's current law. 5

5. List out differences between single phase and three phase AC supply. 5

6. A series RL circuit with R = 20 Ω and L = 20 mH is connected across 230 V, 50 Hz supply. Calculate the impedance, current and power factor. 5

7. Explain the working principle of a transformer. 5

8. Explain working principle of relay. 5

9. Define conductors, insulators and semiconductors with examples. 5

[Turn over

PART – B

10. (a) State and explain Kirchoff's voltage law.   4
    (b) Explain open, close and short circuit conditions.   6

11. (a) If the voltage across a 10 kΩ resistor is 500 V, what is the power dissipated in the resistor ?   5
    (b) Derive formula to find equivalent resistance, when three resistors are connected in series.   5

12. (a) Draw AC voltage waveform and mark all parameters.   4
    (b) Draw pure RL circuit and obtain expression for impedance, power and power factor.   6

13. (a) Define inductive reactance and capacitive reactance.   5
    (b) Define alternating current, amplitude and frequency.   5

14. (a) An RLC series AC circuit has R = 200 Ω, L = 0.05 H and C = 3.53 μF. It is connected across 230 V, 50 Hz supply.   6
        Calculate :
        (i)   Current
        (ii) Power factor
        (iii) Power
    (b) Compare AC current and DC current.   4

15. (a) A transformer with 240 turns on primary & 60 turns on the secondary draws 0.6 A from a 230 V AC supply. Find secondary current and EMF.   5
    (b) Explain self-inductance and mutual inductance.   5

16. (a) Explain the necessity of filters and list type of filters.   6
    (b) List applications of transistors.   4

17. (a) Explain necessity of Grounding/Earthing.   5
    (b) List out different types of switches and write its symbols.

18. (a) Draw and explain V-I characteristics of PN junction diode.
    (b) Explain working of half wave rectifier.

19. (a) Explain UPS with neat block diagram.
    (b) Explain transistor as a switch.