ENGINEERING PHYSICS -II

UNIT-I **(HEAT)**

PART-A

1. Define the term heat.
2. What is meant by temperature and SI unit of temperature?
3. What are the scales used to measure temperatures?
4. What are good and poor conductors?
5. Define mean free path.
6. Define mean square velocity.
7. Define root mean square (RMS)velocity.
8. Define specific heat capacity of a solid (or) liquid.

PART – B

9. Define co-efficient of thermal conductivity.
10. State any three properties of thermal radiation.
11. Define specific heat capacity of a gas at constant pressure.
12. Define specific heat capacity of a gas at constant volume.
13. Derive the relation between pressure and kinetic energy of a gas.
14. Derive the relation between kinetic energy and absolute temperature of a gas.
15. Why c_p is grater then c_v.

PART-C

16. State and explain three types of heat transfer.
17. State the postulates of kinetic theory of gases.
18. Derive the expression for the pressure of gas on the basis of kinetic theory of gases.
19. Derive Mayer's relation ($c_p - c_v = R$).
20. Calculate the value of universal gas constant R from the equation PV=RT.
21. The density of carbon dioxide at STP is $1.977 kgm^{-3}$. Calculate the RMS velocity of carbon dioxide molecules.
22. The root mean square velocity of argon gas molecule at S.T.P. is $434 ms^{-1}$. Fine the density of argon gas at S.T.P.
23. The ratio between two specific heats of a gas is 1.36. The specific heat capacity of the gas at constant volume is $23094 JK^{-1}$ per kg mole. Fine the value of Universal gas constant

ENGINEERING PHYSICS – II

UNIT-III (LIGHT AND REMOTE SENSING)

PART-A

1. What is refraction?
2. Define refractive index of a medium .
3. What are the parts of spectrometer.
4. What is the use of collimator?
5. What is the expansion of the term 'LASER'?
6. Give any properties of laser.
7. What is optical pumping?
8. What are the materials contained in the ruby rod?
9. What is remote sensing?
10. Name the two types of remote sensing.
11. Give the components of remote sensing.
12. Expand the acronym RADAR.
13. What is duplexer in radar?

PART-B

14. State the laws of refraction.
15. What is angle of minimum deviation?
16. Define critical angle.
17. What is total internal reflection?
18. What is the principle used in laser?
19. What is spontaneous emission?
20. What is stimulated emission?
21. Give any three uses of laser.
22. What is active remote sensing? Give examples.
23. What is passive remote sensing? Give examples.

PART-C

24. Explain the parts of the spectrometer and initial adjustments.
25. Derive an expression for the refractive index of glass prism using angle of minimum deviation.
26. Describe an experiment to determine the refractive index of glass prism using spectrometer.
27. Describe the construction and working of Ruby laser.
28. Describe the components of remote sensing.
29. Explain the working of radar with block diagram.
30. Calculate the refractive index of a prism, if the angle of prism is 59^0 and angle of minimum deviation is 40^0.
31. The angle of minimum deviation of an equilateral prism is 38^0. Calculate the refractive index of the material of the prism.
32. The angle of glass prism is 580. Calculate the angle of minimum deviation, if the refractive index of the material of the prism is 1.635.

ENGINEERING PHYSICS –II

UNIT-IV (ELECTRICITY)

PART-A

1. State ohm's law.
2. Define resistance of a conductor.
3. Define resistivity.
4. Define conductivity.
5. State Kirchoff's current law.
6. What is the use of Wheatstone bridge?
7. What is meant by electrolysis.
8. Define electrochemical equivalent of an element.
9. What are the uses of electrolysis.
10. Define capacitance of a capacitor.
11. Define farad.
12. What is meant by shunt.

PART-B

13. State the laws of resistances.
14. What is superconductivity and superconductor?
15. What is Meissner effect?
16. State Kirchoff's laws.
17. State Joule's law of heating.
18. State Faraday's laws of electrolysis.
19. State Fleming left hand rule.
20. Give the advantages (merits) of moving coil galvanometer.
21. Derive and expression for the force acting on a straight conductor carrying current placed in a uniform magnetic field.
22. Derive an expression for the torque experienced by a rectangular current carrying coil placed in a uniform magnetic field.

PART-C

23. Derive the condition to balance the Wheatstone's bridge by using Kirchoff's laws.
24. Describe an experiment to determine the specific het capacity of liquid using Joule's calorimeter.
25. Describe an experiment to determine the e.c.e of copper using copper voltmeter.
26. Derive the expressions for effective capacitance of three capacitors connected in series and parallel.

27. Describe the construction and working of a moving coil galvanometer.
28. Explain how a galvanometer is converted into a ammeter.
29. Explain how a galvanometer is converted into a voltmeter.
30. The resistance of a wire of length 25m and 0.9mm diameter is 0.8Ω. calculate the resistivity of the wire.
31. Calculate the resistance of wire of length 1.5m and diameter 0.5mm. The specific resistance of the material of wire is 45×10^{-8}ohm-m.
32. A current of one ampere passing through a copper voltameter for one hour liberates 1.2gm of copper. Calculate the electro chemical equivalent of copper metal.
33. Find the resultant capacitance of three capacitors of capacitance 10μF, 20 μF,30 μF when they re connected (i) in series and (ii) in parallel.
34. A galvanometer of resistance 60 ohms shows full scale deflection when current of 0.15mA passes through it. How can it be converted into an ammeter to measure a maximum current of 2 amperes?
35. A galvanometer of resistance 20Ω gives full scale deflection for a current of 10mA. How will you convert it into a voltmeter to read 100V?

ENGINEERING PHYSICS –II

UNIT-V (ELECTRONICS)

PART – A

1. What is meant by valence band and conduction band.
2. What is forbidden gap(energy gap)?
3. What are intrinsic semiconductors? Give examples.
4. What are extrinsic semiconductors? Give examples.
5. What are holes in semiconductors?
6. What is doping?
7. What is PN junction diode?
8. What is rectification?
9. What is rectifier?
10. What is an amplifier?
11. What is digital integrated circuit?
12. What is linear integrated circuit?
13. What is meant by P-type semiconductor ?
14. What is meant by P-type semiconductor ?
15. How the PNP transistor is formed?
16. How the NPN transistor is formed?

PART-B

17. What is semiconductor ? give an example.
18. What is called Fermi energy or level?
19. What is meant by forward biasing?
20. What is meant by reverse biasing?
21. What are the different types of transistor configurations?
22. Give the advantages of common emitter configuration.
23. What are the universal gates? Why are they called so?
24. What is an integrated circuits?
25. Give any three advantages of integrated circuits.

PART-C

26. Describe the energy band diagram of good conductors, semiconductors and insulators.
27. Explain how N-type and P-type semiconductors are obtained.
28. Explain full wave rectifier.
29. Explain the working of a NPN transistor as an amplifier in common emitter configuration.
30. With the help of truth tables explain OR,AND, NOT gates.
31. Explain universal logic gates (NOR AND NAND).
32. What are integrated circuits? Explain the levels of integration.

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