

Programme : 1 Year Engg

Course :

Reg.No

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Model Examination – MARCH 2020

(Time – Three hours)

(Maximum Marks: 75)

- N.B:** 1) Answer any FIVE questions in each of PART-A and PART-B and
2) Answer any two divisions of each question in PART-C.
3) Each question carries two marks in PART-A, three marks in PART-B
and five marks for each division in PART-C.

PART – A

1. Define conduction.
2. Define root mean square velocity.
3. What is isothermal change?
4. What is Joule-Thomson effect?
5. Define refractive index?
6. What is population inversion?
7. Define Fleming's left hand rule.
8. What is doping?

PART – B

9. Write any three postulates of kinetic theory of gases.
10. State first law of thermodynamics.
11. What are the advantages of renewable energy sources?
12. Mention any three uses of laser.
13. Write the laws of resistances in series and parallel.
14. Define Faraday's laws of electrolysis.
15. What are the three different configurations of a transistor in a circuit?
16. Give the advantages of integrated circuit.

[Turn Over...]

PART - C

17. (a) Derive the expression for the pressure of a gas on the basis of kinetic theory of gas.
(b) Derive $C_p - C_v = R$ for a perfect gas.
(c) The density of hydrogen gas at S.T.P. is 0.0899 kg/m^3 . Find the R.M.S. velocity of hydrogen molecules.
18. (a) Describe Linde's process for the liquefaction of air.
(b) Write a short note on solar energy.
(c) Air at 5 atmospheric pressure is compressed suddenly to one half of its original volume. Find the resulting pressure. ($\gamma = 1.4$).
19. (a) Describe the construction and working of OFC.
(b) Describe the construction and working of Ruby laser.
(c) Write a short note on RADAR.
20. (a) A thin wire of radius 0.2 mm has a resistance of 7 ohm . The length of the wire is 2 m . Calculate the resistivity of the wire.
(b) Describe an experiment to determine the specific heat capacity of a liquid using joules calorimeter.
(c) Explain the construction and working of moving coil galvanometer.
21. (a) Explain the formation of extrinsic N-type and P-type semiconductor.
(b) Explain the full wave rectifier with a neat diagram
(c) Explain NAND, NOR gates with the help of their truth table.

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PART – A

1. Define radiation.
2. Define specific heat capacity of a gas at constant pressure
3. What is adiabatic change?
4. Define temperature of inversion.
5. Write the Snell's law of refraction?
6. What are Super conductors?
7. State Ohm's law.
8. State Kirchoff's voltage law?

PART – B

9. Derive the relation between pressure and kinetic energy of a gas.
10. State Clausius Statement of second law of thermodynamics
11. Write the characteristics of a laser?
12. What is active and passive remote sensing?
13. State Electro chemical equivalent of an element.
14. How can you convert a galvanometer into an ammeter and voltmeter.
15. Explain forward biased junction diode?
16. Explain NOR gate with truth table.

[Turn Over...

PART – C

17. (a) State the postulates of kinetic theory of gases.
(b) Derive $C_p - C_v = R$ for a perfect gas.
(c) Find the value of gas constant from the equation $PV = RT$.
18. (a) Describe Cascade process for the liquefaction of oxygen.
(b) Write a short note on Wind energy.
(c) Air at 5 atmospheric pressure is compressed slowly to one half of its original volume.
Find the resulting pressure.
19. (a) Calculate the refractive index of the prism, if the angle of the prism is 60° and the angle of minimum deviation is 40° .
(b) Describe the construction and working of Ruby laser.
(c) Write a short note on components of remote sensing.
20. (a) Three capacitors of capacitance $4 \mu\text{F}$, $8 \mu\text{F}$ and $12 \mu\text{F}$ are connected in series and in parallel. Calculate their equivalent capacitance in both cases.
(b) Describe an experiment to determine the Electro chemical equivalent of copper.
(c) Explain the construction and working of moving coil galvanometer.
21. (a) Explain the formation of extrinsic N-type and P-type semiconductor.
(b) Explain the full wave rectifier with a neat diagram
(c) Explain Basic logic gates with the help of their truth table.