Government College, (A), Rajahmundry

Model paper

Fundamental of sustainable energy

I B.Voc REM, Semester-1,
2021-22

I. Answer the following questions? **4X8=32**

1. A) Explain conventional energy and their uses? **OR**

   B) Explain non- conventional energy sources and their uses?

2. A) Explain solar water heating system? How does it work? **OR**

   B) Explain solar furnace and distillation?

3. A) Explain the principle and working of bio gas plant? **OR**

   B) Explain the working of floating holder bio gas plant?

4. A) Explain the basic principle of wind energy conversion? **OR**

   B) Explain tidal energy?

II Answer any six from the following questions **6X3=18**

5. Explain demerits of conventional and non- conventional energy sources?

6. Write the uses of solar energy?

7. Write the applications of bio mass?

8. Write the sources of bio mass?

9. Write the applications of wind energy?

10. What are the disadvantages of wind mills?

11. Explain the geo thermal energy briefly?

12. What are the components of wind turbines?

GOVERNMENT COLLEGE(A), RAJAHMUNDRY
DEPARTMENT OF PHYSICS
I SEMESTER END EXAMINATIONS
I B.Voc (REM)-Paper – 1
UNITS AND MEASUREMENTS, CIRCUIT THEORY AND ELECTRICAL FUNDAMENTALS
(MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

SECTION - A

Answer all questions **4 x 8 = 32M**

1. (a) What is dimensional analysis? Explain its importance?
   (or)
   (b)Explain construction and working of a screw gauge?
2. (a) Derive an expression for growth and decay of current in LR circuit?
   (or)
   (b) Discuss the growth and decay of charge in C-R circuit?
3. (a) Derive an expression for resonant frequency of L-C-R series circuit?
   (or)
   (b) State and Explain Norton's theorem with neat circuit diagram?
4. (a) What is a capacitor? Explain different types of capacitors?
   (or)
   (b) Explain construction and working of a relay?

SECTION - B

Answer any 6 questions **6 x 3 = 18M**

5. What are the base quantities in S.I system and state their units?
6. If the dimensions of mass and length are doubled, what would be the change in force?
7. Derive expression for power factor?
8. What are the differences between series L C R circuit and Parallel L C R circuit?
9. What are fixed and variable resistors? State different types of fixed and variable resistors?
10. A coil of self inductance 50 henry and resistance 100 ohm are joined in series to a 2 volt battery. Calculate the time constant and maximum current?
11. A capacitance of 50 μF and an inductance of 0.2025 henry are connected in series. If the resistance of the circuit is negligible. Find the resonant frequency of the circuit?
12. Explain star and delta connections?

GOVERNMENT COLLEGE(A), RAJAHMUNDRY
DEPARTMENT OF CHEMISTRY
I SEMESTER END EXAMINATIONS
I B.Voc (REM)-Paper – 1
THERMODYNAMICS AND ELECTROCHEMISTRY
(MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

SECTION - A

Answer all questions **4 x 8 = 32M**

3. (a) Discuss the following:
   (i) Internal energy and significance of change in internal energy
   (ii) Enthalpy and change in enthalpy

   (or)

   (b) Write about the concept of Gibb's free energy and write the conditions for equilibrium and spontaneity based on ΔG values.
4. (a) What is Transport number? Explain the determination of Transport number by Hittorf method.

   (or)

   (b) Explain about Ostwald's dilution law and write its limitations.

3. (a) What is Electrode potential? Write about the effect of electrolyte concentration on electrode potential and EMF.

   (or)

   (b) Give a detailed account on Nernst equation.

4. (a) What are Conductometric titrations? Explain the principle, instrumentation and applications of conductometric titrations.

   (or)

   (b) Explain about Amperometric titrations.

SECTION - B

Answer any 6 questions **6 x 3 = 18M**

5. State and explain First law of Thermodynamics.

6. Define: (i) Entropy of fusion (ii) Entropy of Vapourization (iii) Entropy of Sublimation

7. State the Kohlrausch's law and give any two applications.

8. Define: (i) Electrolytic conductivity (ii) Molar conductivity

9. Write about different types of reversible electrodes.

10. Write a short note on Liquid junction potential.

11. Give the Principle of Coulometry.

12. Write a short note on Dropping mercury electrode.

GOVERNMENT COLLEGE(A), RAJAHMUNDRY
DEPARTMENT OF PHYSICS
III SEMESTER END EXAMINATIONS
REG-3T13 PHYSICS-III
NOVEL RENEWABLE ENERGY (MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

Section-A

I Answer all from the following questions 4×8=32

1. **A.** Explain methods to produce hydrogen?**OR**

   B.Explain Hydrogen energy storage and Transportation methods?

2. **A.** Explain Principle and working of fuel cell? **OR**

   B. Explain the components and principle and working of batteries and classify them?

3. **A**. What are the methods of Ocean Thermal Energy Conversion?**OR**

   B. Explain Geothermal Power plants

4. **A.** Explain super conducting magnetic energy storage (SMES) systems?

   OR

   B. Explain the Classifications of Magneto Hydro Dynamic (MHD) Systems?

SECTION- B

II Answer any 6 from the following questions 6×3=18

5. Write Hydrogen Energy Applications
6. Applications for power generations by fuel cell
7. Write the applications of batteries?
8. What are the ocean energy resources?
9. Explain working of super capacitor?
10. Explain Role of carbon nanotubes in electrode of batteries?

11. Find out the energy stored in a capacitor of a capacitance 10 nf operated at 10V.

12. A superconducting magnet coil has an inductance of 500 H and carries a current of 4000 A. Find out the stored energy in the magnetic field.

GOVERNMENT COLLEGE(A), RAJAHMUNDRY
DEPARTMENT OF PHYSICS
I SEMESTER END EXAMINATIONS
REG-3T12 PHYSICS-III
THERMODYNAMICS AND FLUID MECHANICS (MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

SECTION - A

Answer all questions **4 x 8 = 32M**

5. (a) What is adiabatic process? What is the work done in adiabatic process?

(or)

(b)Explain the construction and working of Carnot's engine. Derive the expression for its efficiency.

6. (a Explain the radial flow of heat through spherical shell .

(or)

(b) Explain thermal conductivity- Searle's method.

3. (a) Explain and derive the expression for coefficient of viscosity by Poiseuilles method .

(or)

(b) Explain the stokes law of viscocity and determine the coefficient of viscocity by Stockes method

4. (a) Derive Bernoulli's equation. What are its limitations?

(or)

(b) Derive Euler's equation.

SECTION - B

Answer any 6 questions **6 x 3 = 18M**

5. Explain reversible and irreversible process with examples.

6. Calculate the efficiency of Carnot's engine working between 127°C and 27°C.

7. Write any six differences between conduction , convection and radiation.

8. Explain the conductivity in Glass.

9. Explain the Steady and Unsteady Flow ,Uniform and Non-Uniform Flow of fluids.

10. Explain Surface tension. Give its units and diamensions.

11. Define path line, streamline, streak line.

12. Explain the flow through Orifices.

GOVERNMENT COLLEGE(A), RAJAHMUNDRY
DEPARTMENT OF PHYSICS
III SEMESTER END EXAMINATIONS
REG-3T15 (II B.Voc)
THERMODYNAMICS AND FLUID MECHANICS(MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

Section-A

I Answer all from the following questions 4×8=32

1.**A)**Explain the types of wind turbines?**OR**

B). How many types of Anemometers and how to measure the velocity of wind by it?

2.**A).** Explain the axial momentum theory?**OR**

B). Explain the characteristics of power coefficient and tip speed ratio?

3. **A).**Explain the wind energy conversion into electric power?**OR**

B). Explain the wind driven piston pumps and its limitation.

4.**A).**Explain environmental problems of wind energy? **OR**

B) Explain the factors influencing the wind energy economics?

SECTION- B

II Answer any 6 from the following questions **6×3=18**

5.Explain the current status of wind energy in India?

6. Explain the history of wind energy?

7. Explain the stip theory?

8. Explain the characteristics of Lift and drag force?

9. Determine the torque required for starting a wind driven pump which cylinder diameter 20cm and stoke length 10cm , pumping head is at 10m, stoke of the pump is 0.1m , the crank arm is 0.05m, then find out the force acting on the router shaft due to the weight of the water?

10. Explain the wind driven piston pumps and its limitation?

11. Explain the environmental benefits of wind energy?

12. The wind energy measure 10m height at meteorological observatory is 7 m/sec, then find out the velocity which is at 40m height at a wind turbine sight having similar wind profile.(The roughness height of the laboratory and wind turbine locations are at0.03m and 0.1 m)

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1. **GOVERNMENT COLLEGE(A), RAJAHMUNDRY**

DEPARTMENT OF PHYSICS

III SEMESTER END EXAMINATIONS

REG-3T14

SOLAR THERMAL TECHNOLOGY -1(MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

Section-A

I Answer all from the following questions 4×8=32

1. A. Define solar constant how can you determine it by using Angstrom Pyro-heliometer? **OR**

B. Define Diffuse radiation and how can you measure it?

2. A.Explain - Materials for flat plate collector**OR**

B. Explain Liquid Flat Plate Collector construction and working?

3.**A.**Explain Classification of solar concentrators?**OR**

B. Explain Performance analysis of cylindrical parabolic collector?

4. **A.**Explain working and types of Solar Water heaters?**OR**

B. Explain solar refrigeration?

SECTION- B

II Answer any 6 from the following questions 6×3=18

5. Explain sun is the source of radiation

6. Define the following basic Earth Sun angles?

1. Latitude angle, 2.Altitude angle

7. Explain the construction and working of solar ponds?

8.What are the parameters to characterize the solar concentrating collectors?

9.Solar furnace working

10. Explain the working of solar cookers?

11.Calculate the number of day light hours (sunshine hours) in Srinagar on January 1 and July 1. The latitude of Srinagar is 34° 05^{1} N.

12. Calculate the hour angles at sunrise on June 21 and also on December 21.

Model Paper
GOVERNMENT COLLEGE, AUTONOMOUS

RAJAHMUNDRY.

II. B.Voc REM SEM -3, **2021-22**

PHYSICAL CHEMISTRY

Section-A

I. answer all from the following questions **4×8=32**

1. A. What is rate of reaction? Derive the equation of second order reaction having same type of reactants. **OR**

B. Derive the Michaelis-Menton's equation.

2. A. Write the crystal systems and Draw the structures of Bravaice lattice **OR**

B. Write the classification of solids and explain their properties.

3. A. Write the following

i) Jablonsky diagram

ii) Fluorescence

iii) Phosphorescence **OR**

B. Write the following

i) Beer law

ii) Beer-Lambert's law

iii) Quantum yield

4. A. Write the important factors influenced by stability of Nucleus **OR**

B. Write the applications of radioactivity.

SECTION- B

II Answer any SIX from the following questions **6×3=18**

5. Write the differences between order and molecularity of a reaction.

6. Derivation of Arrhenius equation.

7. Derive the Bragg's equation

8. Write the classification of magnetic properties.

9. Write Grothus-Drappers law.

10. Explain Photosensitized reactions.

11. Write the Geiger- Muller (G.M) counter.

12. Write about fission and fusion.

GOVERNMENT COLLEGE(A), RAJAHMUNDRY
DEPARTMENT OF PHYSICS
V SEMESTER END EXAMINATIONS
III B.Voc (REM)-Paper – X
ENVIRONMENT HEALTH AND SAFETY IN INDUSTRIES
(MODEL PAPER)

Max.Marks:50 **Time:2.30hr**

SECTION - A

Answer all questions **4 x 8 = 32M**

7. (a) Write about the role of trade union safety representatives.

(or)

(b) Explain the role of personal protective equipment and selection criteria.

8. (a) Write about features of design of work premises.

(or)

(b) Write the control methods to eliminate the risk from the use of work equipment.

3. (a) What are the functions and techniques of risk assessments.

(or)

(b) Write the principles of quality management systems in health and safety management.

4. (a) Explain the principles and methods of effective training.

(or)

(b) What are the requirements for provision of instruction, training and supervision.

SECTION - B

Answer any 6 questions **6 x 3 = 18M**

5. What is Ergonomics and what are the factors of ergonomics.

6. What are the categories of health hazards.

7. Write about fire safety and first aid provision.

8. Write about the contingency arrangements for events of imminent danger.

9. What are the elements of health and safety policy.

10. Write the relation between Quality manuals, safety policies and risk assessments.

11. What are the feed back and evaluation mechanisms of education and training.

12. Write about the blend learning methodologies.