

COURSE CODE : PHY 122 WO

**ANDHRA LOYOLA COLLEGE (AUTONOMOUS): VIJAYAWADA MODEL PAPER  
I B.SC PHYSICS :: II SEMESTER END EXAMINATION PAPER II**

**WAVES AND OSCILLATIONS**

**MODEL PAPER**

**MAX.MARKS: 100**

**TIME : 2 Hours**

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**ANSWER ANY FIVE THE FOLLOWING QUESTIONS.**

**(20×5 = 100)**

1. What is simple oscillator? Derive the equation of Simple oscillator and obtain the solution for equation of motion of simple oscillator.
2. What are Lissajous figures? Find the resultant of two simple harmonic motions of same frequency acting along two mutually perpendicular directions.
3. What are damped oscillations? Derive the equation of motion of a damped oscillator and hence obtain solution for equation of damped oscillator.
4. What is a forced oscillator? Give the electrical analogy of a mechanical oscillator.
5. What are transverse waves? Derive the expression for velocity of transverse wave along a stretched string
6. State the laws of transverse vibrations of a string? Discuss the modes of vibrations of a stretched string clamped at both the ends.
7. What are ultrasonic's? Mention at least four applications of ultrasonics. Discuss the production of ultrasonics by piezo electric method with neat diagram.
8. What are longitudinal waves? Obtain wave equation and its solution for longitudinal waves in a bar.
9. Obtain Fourier's analysis for a Saw-Tooth wave.
10. State and explain Fourier's theorem. Derive the expressions for Fourier's constants.

COURSE CODE : PHY 244 TPH

ANDHRA LOYOLA COLLEGE (AUTONOMOUS) :: VIJAYAWADA-520 008

II B.Sc. (PHYSICS)-IV SEMESTER PAPER-IV

THERMAL PHYSICS

*MODEL PAPER*

TIME: 2Hrs

MAX MARKS: 100

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ANSWER ANY **FIVE** THE FOLLOWING QUESTIONS.

(20×5 = 100)

1. Derive the formula for the efficiency of a Carnot's heat engine.
2. Distinguish between isothermal and adiabatic processes. Derive the formula for the work done during adiabatic process.
3. Derive Maxwell's thermodynamic relations.
4. Derive an expression for the difference of two specific heats for a van der Waal's gas.
5. Derive Maxwell's law of distribution of molecular speeds
6. Derive an expression for the coefficient of viscosity of a gas based on kinetic theory of gases.
7. State Planck's hypothesis and derive Planck's law.
8. What is a pyrometer? Describe the construction and working of total radiation pyrometer.
9. What is Joule-Kelvin effect? Derive an expression for the cooling produced when a real gas suffers Joule-Thomson effect.
10. Explain the construction and working of an air-conditioning machine.

COURSE CODE : PHY367 ADE

**ANDHRA LOYOLA COLLEGE (AUTONOMOUS) :: VIJAYAWADA-8**  
**III B.Sc PHYSICS : SEMESTER VI: PAPER VII-(A)**  
**ANALOG AND DIGITAL ELECTRONICS**  
**MODEL PAPER**

**TIME: 2 HRS**

**MAX MARKS: 100**

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**ANSWER ANY FIVE THE FOLLOWING QUESTIONS.**

**(20×5 = 100)**

1. Explain the Construction and Working of JFET with necessary diagrams. Discuss the Drain Characteristics of JFET
2. Explain the Construction and Working of DEMOSFET and E Only MOSFET
3. Discuss internal block diagram of Operational Amplifier. Explain Differential Gain and Common Mode Gain
4. Explain the working of voltage series feedback amplifier with circuit diagram and obtain expression for closed loop gain.
5. Obtain the expressions for Gains in Inverting and Non Inverting Operational Amplifiers with necessary circuits
6. Define various characteristics of op-amps. Differentiate between ideal and practical op-amps.
7. Discuss 4 to 1 Multiplexer with necessary circuit and Truth Table. Realize NAND Gate with TTL Logic
8. Explain the construction and functioning of Astable multivibrator .
9. Discuss the operation of JK Flip Flop with necessary circuit diagram and truth table
10. Explain the process of conversion of BCD code to GRAY code and GRAY code to BCD code with examples.

Course code : PHY 368 C1 IMM

**ANDHRA LOYOLA COLLEGE (AUTONOMOUS), VIJAYAWADA-8**  
**III B.Sc. PHYSICS- VI SEMESTER EXAMINATION: PAPER-VIII-(A)**  
**CLUSTER ELECTIVES I- (ELECTRONICS)**  
**INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS**  
***MODEL PAPER***

**TIME: 2 HRS**

**MAX MARKS: 100**

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**ANSWER ANY FIVE THE FOLLOWING QUESTIONS.**

**(20×5 = 100)**

1. Write a note on Semiconductor Memory- RAM, ROM, PROM, EPROM. Describe the Organization of microprocessor based system.
2. Write the schematic diagram of 8085 microprocessor, and explain it's Register structure, Arithmetic Logic Unit.
3. Explain the pins of 8085 related to data bus, address bus, control and status signals.
4. Discuss the data transfer, arithmetic and logic group set of instructions of 8085 microprocessor.
5. Write an assembly language program with algorithm for Decimal addition, largest and smallest of the given set of numbers.
6. Write the functional diagram of 8255 and explain the programmable peripheral interface.
7. Describe the internal architecture of the micro controller of 8051.
8. Explain data transfer and arithmetic instructions of 8051 micro controller
9. Discuss the characteristics and basic structure of an embedded system
10. Write an essay on Embedded system development environment.

Course code : PHY 368-C3EI

ANDHRA LOYOLA COLLEGE (AUTONOMOUS), VIJAYAWADA-8

III B.Sc PHYSICS : SEMESTER VI: PAPER VIII-(A)

CLUSTER ELECTIVE 3 :: ELECTRONIC INSTRUMENTATION

*MODEL PAPER*

TIME: 2 HRS

MAX MARKS: 100

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ANSWER ANY **FIVE** THE FOLLOWING QUESTIONS.

(20×5 = 100)

- 1) Discuss the classification of Instruments and define its various characteristics
- 2) Discuss the construction of multi range DC voltmeter, series & shunt type Ohmmeters.
- 3) Explain the construction and working of a transformer. Explain various losses associated with a transformer
- 4) Explain the operation of a Full wave Rectifier with necessary circuit diagram and obtain the expression for Efficiency.
- 5) Draw the block diagram of CRO. Explain the functioning of each block.
- 6) Explain the working of 2 stage RC Coupled amplifier with necessary circuit diagram.
- 7) Draw the circuit diagram of RC Phase shift oscillator. Discuss its operation and give the expression for frequency of oscillations.
- 8) Obtain the expression for unknown frequency using Wien's Bridge circuit. List out the differences between AC bridges and DC bridges
- 9) Explain the construction and working of UJT. Discuss VI characteristics of UJT.
- 10) Explain the working of Successive Approximation type of ADC with necessary diagram.