SRR&CVR GOVT DEGREE COLLEGE (A)

VIJAYAWADA-4

DEPT OF PHYSICS & ELECTRONICS

BOS RESOLUTIONS

IN

ELECTRONICS

2018-2019

Board of Studies Meeting In ELECTRONICS

SEMESTER PATTERN

w.e.f.

THE ACADEMIC YEAR 2018-2019

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS) Vijayawada 520004

Minutes of the meeting of the Board of Studies in the subject of

ELECTRONICS

The meeting of the Board of Studies in the subject of ELECTRONICS was held on 21st March 2018 in Dept. of Physics Laboratory, SRR & CVR Govt . Degree College (A), Vijayawada 520004.

The following members attended the meeting:

LIST OF BoS MEMBERS

S.No	Name	Qualification	Designation	Address
1.	Mrs. P. Sailaja	M.Sc, M.phil	Chairman	I/C Dept. of Physics and Electronics SRR&CVR GDC (A)
2.	Dr. J. Siva Ramakrishna	M.Sc, Ph.D	University Nominee	Dept. of Physics, Acharya Nagurjuna University Guntur
3.	Mrs. B. Naga Mani	M.Sc, , Ph.D	Subject Expert	I/C Dept. of Physics Govt Degree College, Mylavaram
4.	Dr. R. Kameswari	M.Sc, B.Ed, M.Phil, Ph.D	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
5.	K. Sujatha	M.Sc(tech), (Ph.d)	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
6.	Md. Iqabal Basha	M.Sc, M.Ed, M.Phil.	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
7.	T.V Ram Babu	M.Sc(tech),M.Ed.	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
8.	V.Uma Lakshmi	M.Sc, M.Phil, PGDHE, CSIR-NET, (Ph.D)	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).

P. Sailaja

J. S. R. K. 21.3.2018

B. Nagamani

21.3.2018

AGENDA FOR BOS MEETING

Type of meeting: Board Of Studies meeting in ELECTRONICS subject.

Facilitator: **Mrs.P.Sailaja**, I/c. Dept. of Physics & Electronics.

Note Taker : Mrs.K.Sujatha, Lecturer in physics

Attendees: **BOS** Members.

Time & Date: 9.30 AM ON 21 th March 2018, Wednesday

Location: To be held at Dept. of Physics & Electronics, SRR&CVR GDC

Agenda Items:

Item 1: Approval of syllabus for Semester III and IV for the Academic year 2018-19

Item 2: Approval of Question paper, blue print and model paper

Item 3: Approval for Internal assessment component, Minimum marks in internal assessment

P. Sailaja

J. S. R. Murthy 21.3.2018

B Nagamani 21/3/18

RESOLUTIONS

The Chairperson, Board of Studies welcomed the members and initiated discussion on the syllabus for III and IV semesters. He apprised the members of the guidelines of the UGC and the CCE regarding the framing of syllabus, and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

Resolutions:

1. Resolved to adopt the present University CBCS syllabus for semester III and IV, with the suggested modifications.
2. Resolved to approve the division of marks for internal and external examination along with the suggested blue print and model paper.
3. Resolved to approve the list of paper setters and examiners submitted by the department

S.No	Name	Designation	SIGNATURE
1.	Mrs.P. Sailaja	Chairman	P. Sailaja
2.	Dr. J. Siva Ramakrishna	University Nominee	J.S.R.
3.	Mrs. B. Naga Mani	Subject Expert	B Nagamani
4.	Dr. R. Kameswari	Member	R Kameswari
5.	K. Sujatha	Member	K. Sujatha
6.	Md. Iqabal Basha	Member	
7.	T.V Ram Babu	Member	T Ram Babu
8.	V.Uma Lakshmi	Member	V. Uma Lakshmi

Principal

PRINCIPAL
SRR & CVR GOVT. DEGREE COLLEGE
(Autonomous)
Machavaram, VIJAYAWADA - 520 004.

Theory Internal Marks: 40

For all theory papers

Internal exam(two)	-	10
Assignments (two)	-	10
Project	-	10
Attendance	-	5
Seminar	-	5
Total		40

P. Leelah

J. S. R[illegible]

21.3.2018

B Nagamani

SRR & CVR GOVT. DEGREE COLLEGE (A)

VIJAYAWADA – 520 004

B.Sc. 3rd Semester Electronics

(w.e.f 2018-2019)

Paper III: Digital Electronics

BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	0	2
Unit II	2 (with internal choice)	1	1
Unit III	2 (with internal choice)	2	
Unit IV	2 (with internal choice)	2	
Unit V	2 (with internal choice)	2	

P. Leelala

J. S. R.

21.3.2018

B Nagamani

Model question Paper for all theory papers

Time : 3 hrs

Max marks : 60M

Section-A (Essay type)

Answer All questions with internal choice from all units (I to V). Marks : 5 X 8 M = 40 M

(Two questions are to be set from each unit with internal choice)

Section-B (Short answer type)

Answer any five out of 10 questions from all units (I to V) Marks: 5 x 4M = 20 M

At least two questions should be set from each unit.

(At least three problems should be given.)

P Sekhar

J.S.R. 21.3.2018

B Nagamani

S.R.R & C.V.R GOVERNMENT DEGREE COLLEGE(AUTONOMOUS), VIJAYAWADA
B.Sc. Electronics Syllabus, Semester-3
w.e.f. 2018-19

SEMESTER – III **PAPER – 3**

Digital Electronics

Unit – I (9hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal, BCD. Conversions, Complements (1's, 2's,9's and 10's), Addition, Subtraction, Gray, Excess-3 Code conversion from one to another.

Unit- II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, Universal NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4,5 variables),don't care condition.

Unit-III (15hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1,4:1)) and Demultiplexers (1:2,4:1), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, DTL logic, RTL Logic, CMOS inverter.

UNIT-IV (14hrs)

SEQUENTIAL DIGITAL CIRCUITS:
Flip Flops: S-R FF , J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables. Registers:-shift left register, shift right register, Counters - Asynchronous-Mod16 up & down counter, Mod-10, Synchronous-4-bit up counter.

UNIT-V (10hrs)
MEMORY DEVICES:
General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM, PLA (Programmable logic Array),PAL(Programmable Array Logic)

21-3-2018

B Nagamani

TEXT BOOKS:

1. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV)
3. G.K.Kharate-Digital electronics-oxford university press
4. S.Salivahana&S.Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar

Reference Books :

1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985.
2. S.K. Bose. "Digital Systems". 2/e. New Age International. 1992.
3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters : Fundamentals & Applications". TMH. 1994.
4. *Malvino and Leach. " Digital Principles and Applications ". TMG Hill Edition.*

ELECTRONICS LAB-3 (50M, Internal 25+ External 25)

(DIGITAL ELECTRONICS LAB)

LAB LIST:

1. Verification of IC-logic gates
2. Realization of basic gates using discrete components (resistor. diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verify Half adder and full adder using gates
5. Verify Half subtractor and full subtractor using gates.
6. Verify the truth table of RS . JK. T-F/F using NAND gates
7. 4-bit binary Counter using Flip-Flops.
8. BCD to Seven Segment Decoder using IC -7447/7448

Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.

P. Gelak

21.3.2018

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS) VIJAYAWADA

UG EXAMINATION

B.SC ELECTRONICS

SECOND YEAR-SEMESTER-III

PAPER-III DIGITAL ELECTRONICS

Model Question Paper

Time: 3 Hours | Marks: 60

Part- A | 5×4=20M

Answer any Five questions:

1.) Explain the procedure for Binary to Gray code conversion.

2.) Explain Decimal to binary conversion.

3.) State and prove Demorgan's theorems.

4.) Simplify $AB\overline{C}+\overline{A}B+A\overline{B}+ABC$ Using Boolean algebra.

5.) Explain 8 to 3 Encoders.

6.) Explain CMOS inverter.

7.) Explain Mod-8 counter with block diagram and count sequence table.

8.) Draw the logic diagram of T flip flop and explain its operation with the help of truth table.

9.) Explain the working of static RAM cell.

10.) Explain EEPROM.

Part-B | 5×8=40M

Answer the following Questions:

Unit -I

9.) (a) Subtract 11001 from 11100 using 1's complement method.

(b) Subtract 16874 from 59647 using 10's complement method.

(Or)

10.) (a) Convert $4F75_{16}$ into binary.

(b) Convert 7954_{16} into decimal.

Unit-II

11.) Deduce the expression F(A,B,C,D). $\Sigma m(0,1,4,5,8,9,10,11,12,13,14,15)$.

(Or)

12.) Explain briefly about universal NAND and NOR gates.

Unit- III

13.) Explain the working of Full Adder with truth table and circuit diagram.

(Or)

14.) What is Multiplexer? Explain the Working of 4-1multiplexer.

Unit-IV

15.) Explain the working of Master Slave JK flip flop and give its truth table.

(Or)

16.) Describe 4- bit synchronous counter with logic diagram and count sequence table.

Unit-V

17.) What are the different types of semi conductor memories? Illustrate.

(Or)

18.) Explain PLA with neat sketch.

P Sekar

21.3.2018

B Nagaraj

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SRR & CVR GOVT. DEGREE COLLEGE (A)

VIJAYAWADA – 520 004

B.Sc.4 th Semester Electronics

(w.e.f 2018-2019)

Paper IV: Analog & Digital IC Applications

BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	1	1
Unit II	2 (with internal choice)	2	
Unit III	2 (with internal choice)	2	
Unit IV	2 (with internal choice)	2	
Unit V	2 (with internal choice)	2	

P. Gopal

J. S. R. [illegible] 21.3.2018

B Nagamani

Model question Paper for all theory papers

Time : 3 hrs

Max marks : 60M

Section-A (Essay type)

Answer All questions with internal choice from all units (I to V). Marks : 5 X 8 M = 40 M

(Two questions are to be set from each unit with internal choice)

Section-B (Short answer type)

Answer any five out of 10 questions from all units (I to V)

Marks: 5 x 4M = 20 M

At least two questions should be set from each unit.

(At least three problems should be given.)

P. Giridhar

J.S.R. Krishna 21.3.2018

B Nagamani

S.R.R & C.V.R GOVERNMENT DEGREE COLLEGE(AUTONOMOUS), VIJAYAWADA

B.Sc. Electronics Syllabus, Semester-4

w.e.f. 2018-19

SEMESTER 4 PAPER 4

Analog and Digital IC-Applications

Unit – I (10hrs)

OPERATIONAL AMPLIFIERS: Definition, Basic op-amp Ideal op-amp, Block diagram of op-amp, inverting, noninverting, virtualground, Adders, subtractors, summing amplifier, voltage follower, op-amp parameters, voltage to current convertor ,integrator, differentiator, differential amplifier, Logarithmic amplifier.

Unit- II (15 hrs)

OP-AMP CIRCUITS: voltage regulator, comparator, multivibrators-astable, monostable, Bi-stable, Schmitt trigger, sine wave generator, square wave generator, triangular wave generator, Active filters(Basics)-low pass, high pass, band pass filters

IC-555 –functional block diagram and mention its applications

Unit-III (15hrs):

COMBINATIONAL & SEQUENTIAL LOGIC CIRCUITS (IC-Applications):

Design of Code convertor: BCD to Seven Segment, BCD to Grey, Grey to Binary.

Design of Counters using State Machine: Mod N counter, Preset Table,Binary Up/Down Counter, Design of Universal Shift Register

UNIT-IV (10hrs)

DATA CONVERTERS:

A/D converter:- Successive Approximation ADC,-Single slope and dual slope converter, Sigma-delta ADC. D/A converter: R-2R Ladder network, Binary Weighted .

UNIT-V (10hrs)

DIGITAL SYSTEM INTERFACING AND APPLICATIONS: interfacing of LED's

Applications of Counters: Digital Clock

Applications of Shift Registers: Parallel to Serial ,Serial to Parallel, UART

21.3.2018

TEXT BOOKS:

6. G.K.Kharate-Digital electronics-oxford university press
7. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
8. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
9. Linear Integrated Circuits By Roy Choudary

Reference Books :

5. Jacob Millman,Micro Electronics,McGraw Hill.
6. Mithal G K, Electronic Devices and Circuits Thana Publishers.
7. Allan Motter shead ,Electronic Devices and Circuits – An Introduction- Prentice Hall

ELECTRONICS LAB-3 (50M, Internal 25+ External 25)

(Analog and digital IC-Applictions)

LAB LIST:

1. Op-Amp as inverting and non-inverting.
2. Op-Amp as integrator and differentiator
3. Op-Amp as adder & subtractor
4. Op-Amp as voltage to current converter
5. Op-Amp as sine wave generator (Wien bridge oscillator)
6. Op-Amp as sine wave generator
7. Astable multivibrator determination of frequency (using IC 555)
8. Voltage Regulator Circuit Using OP-AMP.

Lab experiments are to be done on breadboard and simulation software (using Multisim) and output values are to be compared and justified for variation.

21.3.2018

B Nagamani

SYLLABUS UP GRADATION

ELECTRONICS

2018-19

Paper	Syllabus revision	justification
Sem-3, paper- 3 Digital Electronics	Additions -Universal logic gates- Implementation of all logic gates using NAND and NOR gates, CMOS inverter Deletions: Multilevel NAND and NOR gates	To give comprehensive knowledge on gates.
Sem- 4, PAPER-4 Analog and Digital IC Applications	Deletions— Instrumentation amplifier Additions-Multivibrators Lab: Voltage regulator using OP-AMP.	To give a detail understanding of applications of OPAMP.

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS) VIJAYAWADA

UG EXAMINATION

B.SC ELECTRONICS

SECOND YEAR-SEMESTER-IV

PAPER-IV: Analog and Digital IC Applications

Model Question Paper

Time: 3 Hours Marks: 60

Part- A 5×4=20M

Answer any Five questions:

1.) Explain Integrator circuit using OP AMP.

2.) Explain the concept of virtual ground.

3.) Explain the low pass filter using OP AMP.

4.) Explain the comparator circuit using OP AMP.

5.) How do you design to convert Gray numbers into Binary.

6.) Explain the design of Mod-N counter using state machine.

7.) Explain R-2R ladder network.

8.) Explain Sigma-Delta ADC.

9.) Explain the interfacing of LED.

10.) Draw the block diagram of UART.

Part-B 5×8=40M

Answer the following Questions:

Unit'-I

11) Draw the block diagram of OP AMP and explain its each block.

(Or)

Draw the circuit diagram of logarithmic amplifier and explain.

Unit-II

12) Explain monostable multivibrator circuit using OP AMP.

(Or)

Explain the sine wave generator with neat circuit diagram using OP AMP.

Unit- III

13) Explain code conversion of BCD to Seven segment display.

(Or)

Explain the design of universal shift registers.

Unit-IV

14) Explain dual slope A/D Convertor.

(Or)

Explain binary weighted D/A convertor.

Unit-V

15) Explain the working of digital clock.

(Or)

Explain parallel to serial shift registers.

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21-3-2018

B. Nagamani

SRR&CVR GOVT.DEGREE COLLEGE, VIJAYAWADA

DEPT.OF PHYSICS & ELECTRONICS

LIST OF EXAMINERS

PHYSICS

1.K.Srinivasa Rao,Lec.in Physics

GDC,Avanigadda.Cell no.9440655608

2.B.Naga Mani, Lec.in Physics

GDC,Mylavaram.Cell no.9866546848

3.K.M.Rajesh, Lec.in Physics

GDC,Tiruvuru.Cell no.9948716718

4.SK.Basha, Lec.in Physics

GDC,Rajahmundry.Cell no.9705964213

5.S.Venkateswara Rao, Lec.in Physics

GDC for Women,Guntur.Cell no.9440533241

ELECTRONICS

1.L.Ekambaram,Lec.in Electronics

Andhra Loyola College,Vijayawada.Cell no.9705702806

2.K.S.V.Sambasiva Rao, Lec.in Electronics

P.B.Siddhartha College,Vijayawada.Cell no.9441469690

3.B.Balaji Bhanu, Lec.in Electronics

Andhra Loyola College,Vijayawada.Cell no.9885135522

4.K.H.Anuhya, Lec.in Electronics

Maris Stella College,Vijayawada.Cell no.9949340949

5.A.Omkara Murthy, Lec.in Electronics

J K C College, Guntur .Cell no.9701463450

6.K.Madhavi,KRU BOS Member, , Lec.in Electronics

Nalanda Degree College,Vijayawada.Cell no.9618189439.

7.N.Lakshmi Kanth, Lec.in Electronics

Andhra Loyola College,Vijayawada.Cell no.9014353640.

8.Kantha Rao, , Lec.in Electronics

KBN College,Vijayawada.Cell no.8985361217.

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SRR & CVR GOVT. DEGREE COLLEGE (A)
MACHAVARAM, VIJAYAWADA –4

A meeting on Up gradation of Syllabus Of Dept. of
PHYSICS\ELECTRONICS

List of Examiners for Theory / Practical

S.No	Name of the lecturer	Designation	College
1.	Dr.K. Ramachandra Rao	Assoc.Prof	GDC(A), Rajahmundry
2.	S.Venkateswara rao	Assit prof	GDC(A), Guntur
3	Sk. Basha	Assit.Prof	GDC(A), Rajahmundry
4 .	Dr. Sathya narayana Reddy	Assit.Prof	GDC(A), Rajahmundry
5.	K. Jaya Dev	Assit.Prof	PR college (A), Kakinada
6.	B.Naga Mani	Assit.Prof	GDC, Mylavaram
7.	L Ekambaram	Assit prof	Andhra Loyola College(A),vja
8.	K S V Sambasiva Rao	Assit prof	P B Siddartha college,vja
9.	B Balaji Bhanu	Assit prof	Andhra Loyola College(A),vja
10.	K H Anuhya	Assit prof	Maris Stella College ,vja

PANEL FOR PAPER SETTERS FOR AUTONOMOUS

S.No	Name of the lecturer	Designation	College
1.	Dr.K. Ramachandra Rao	Assoc.Prof	GDC(A), Rajahmundry
2.	S.Venkateswara rao	Assit prof	GDC(A), Guntur
3	Sk. Basha	Assit.Prof	GDC(A), Rajahmundry
4 .	Dr. Sathya narayana Reddy	Assit.Prof	GDC(A), Rajahmundry
5.	K. Jaya Dev	Assit.Prof	PR college (A), Kakinada
6.	B.Naga Mani	Assit.Prof	GDC, Mylavaram
7.	L Ekambaram	Assit prof	Andhra Loyola College(A),vja
8.	K S V Sambasiva Rao	Assit prof	P B Siddartha college,vja
9.	B Balaji Bhanu	Assit prof	Andhra Loyola College(A),vja
10.	K H Anuhya	Assit prof	Maris Stella College ,vja

SRR&CVR GOVT DEGREE COLLEGE (A)

VIJAYAWADA-4

DEPT OF PHYSICS & ELECTRONICS

BOS RESOLUTIONS

IN

PHYSICS

2018-2019

Board of Studies Meeting In PHYSICS

SEMESTER PATTERN

w.e.f.

THE ACADEMIC YEAR 2018-2019

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS) Vijayawada 520004

Minutes of the meeting of the Board of Studies in the subject of

PHYSICS

The meeting of the Board of Studies in the subject of Physics was held on 21st March 2018 in Dept. of Physics Laboratory, SRR & CVR Govt . Degree College (A), Vijayawada 520004.

The following members attended the meeting:

LIST OF BoS MEMBERS

S.No	Name	Qualification	Designation	Address
1.	Mrs. P. Sailaja	M.Sc, M.phil	Chairman	I/C Dept. of Physics and Electronics SRR&CVR GDC (A)
2.	Dr. J. Siva Ramakrishna	M.Sc, Ph.D	University Nominee	Dept. of Physics, Acharya Nagurjuna University Guntur
3.	Mrs. B. Naga Mani	M.Sc, , Ph.D	Subject Expert	I/C Dept. of Physics Govt Degree College, Mylavaram
4.	Dr. R. Kameswari	M.Sc, B.Ed, M.Phil, Ph.D	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
5.	K. Sujatha	M.Sc(tech), (Ph.d)	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
6.	Md. Iqabal Basha	M.Sc, M.Ed, M.Phil.	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
7.	T.V Ram Babu	M.Sc(tech),M.Ed.	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).
8.	V.Uma Lakshmi	M.Sc, M.Phil, PGDHE, CSIR-NET, (Ph.D)	Member	Dept. of Physics and Electronics SRR&CVR GDC (Autonomous).

P. Sailaja

J. S. R. 21-3-2018

B Nagamani

AGENDA FOR BOS MEETING

Type of meeting: Board Of Studies meeting in PHYSICS subject.

Facilitator: **Mrs.P.Sailaja**, I/c. Dept. of Physics & Electronics.

Note Taker : Mrs.K.Sujatha, Lecturer in physics

Attendees: **BOS** Members.

Time & Date: 9.30 AM ON 21 th March 2018, Wednesday

Location: To be held at Dept. of Physics & Electronics, SRR&CVR GDC

Agenda Items:

Item 1: Approval of syllabus for Semester III and IV for the Academic year 2018-19

Item 2: Approval of Question paper, blue print and model paper

Item 3: Approval for Internal assessment component, Minimum marks in internal assessment

P. Sailaja

J. S. Rao 21.3.2018

B Nagamani

RESOLUTIONS

The Chairperson, Board of Studies welcomed the members and initiated discussion on the syllabus for III and IV semesters. He apprised the members of the guidelines of the UGC and the CCE regarding the framing of syllabus, and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

Resolutions:

1. Resolved to adopt the present University CBCS syllabus for semester III and IV, with the suggested modifications.
2. Resolved to approve the division of marks for internal and external examination along with the suggested blue print and model paper.
3. Resolved to approve the list of paper setters and examiners submitted by the department

S.No	Name	Designation	SIGNATURE
1.	Mrs.P. Sailaja	Chairman	P. Sailaja
2.	Dr. J. Siva Ramakrishna	University Nominee	J.S.R.K 21.3.2016
3.	Mrs. B. Naga Mani	Subject Expert	B Nagamani
4.	Dr. R. Kameswari	Member	R. Kameswari
5.	K. Sujatha	Member	K. Sujatha
6.	Md. Iqabal Basha	Member	
7.	T.V Ram Babu	Member	T Ram Babu
8.	V.Uma Lakshmi	Member	V. Uma Lakshmi

Principal

PRINCIPAL
SRR & CVR GOVT. DEGREE COLLEGE
(Autonomus)
Machavaram, VIJAYAWADA - 520 004.

SRR & CVR GOVT. DEGREE COLLEGE (A)

VIJAYAWADA – 520 004

B.Sc. 3rd Semester Physics

(w.e.f 2018-2019)

Paper III: Wave Optics

BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	
Unit II	2 (with internal choice)	1	1
Unit III	2 (with internal choice)	1	1
Unit IV	2 (with internal choice)	1	1
Unit V	2 (with internal choice)	2	

21-3-2018

B Nagamani

Model question Paper for all theory papers

Time : 3 hrs

Max marks : 60M

Section-A (Essay type)

Answer All questions with internal choice from all units (I to V). Marks : 5 X 8 M = 40 M

(Two questions are to be set from each unit with internal choice)

Section-B (Short answer type)

Answer any five out of 10 questions from all units (I to V) **Marks: 5 x 4M = 20 M**

At least two questions should be set from each unit.

(At least three problems should be given.)

P. Sekhar

J. S. R. Murthy 21-3-2015

B Nagaraju

SRR&CVR Government Degree College (A), Vijayawada
Physics Paper III: Wave Optics
III SEMESTER

Work load:60 hrs per semester **4 hrs/week**

UNIT-I (8 hrs)

1. Aberrations:
Introduction – monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration-the achromatic doublet. Achromatism for two lenses (i)in contact and (ii) separated by a distance.

UNIT-II (14hrs)

2. Interference
Principle of superposition – coherence-temporal coherence and spatial coherence-conditions for interference of light.Fresnel's biprism-determination of wavelength of light –change of phase on reflection.Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (cosine law) –colors of thin films-
Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film). Determination of diameter of wire, Newton's rings in reflected light. Michelson interferometer-working and construction, Determination of wavelength of monochromatic light using Newton's rings

UNIT-III (14hrs)

3. Diffraction
Introduction.distinction between Fresnel and Fraunhoffer diffraction, Fraunhoffer diffraction –Diffraction due to single slit-Fraunhoffer diffraction due to double slit-Fraunhoffer diffraction pattern with N slits (diffraction grating).Resolving power of grating
Fresnel's half period zones-area of the half period zones-zone plate-comparison of zone plate with convex lens-

UNIT-IV(10 hrs)

4.Polarisation:
Polarized light: methods of polarization polarization by reflection, refraction, double refraction, scattering of light-Brewster's law-Mauls law-Nicol prism polarizer and analyzer- Quarter wave plate, Half wave plate-optical activity, Babinet's compensator

UNIT-V (14hrs)

5. Lasers and Holography
Lasers: introduction, spontaneous emission, stimulated emission. Population Inversion, Laser principle Einstein coefficients (Qualitative treatment only) , Types of lasers-He-Ne laser, Ruby laser-Applications of lasers. Holography: Basic principle of holography-Gabor hologram and its limitations, Applications of holography.

6. Fiber Optics Introduction- different types of fibers, rays and modes in an optical fiber, fiber material, principles of fiber communication (qualitative treatment only), advantages of fiber optic communication.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand& Co.
3. Unified Physics Vol.II Optics & Thermodynamics – Jai Prakash Nath&Co.Ltd., Meerut
4. Optics,F..A. Jenkins and H.G. White, Mc Graw-Hill
5. Optics, AjoyGhatak,Tata Mc Graw-Hill.
6. Introduction of Lasers – Avadhanulu, S.Chand& Co.
7. Principles of Optics- BK Mathur, Gopala Printing Press, 1995

Practical Paper III: Wave Optics **2 hrs/week**

Work load:30 hrs

Minimum of 6 experiments to be done and recorded

1. Determination of radius of curvature of a given convex lens-Newton's rings.
2. Resolving power of grating.
3. Dispersive power of a prism.
4. Determination of wavelength of light using diffraction grating-minimum deviation method.
5. Determination of wavelength of light using diffraction grating-normal incidence method.
6. Resolving power of a telescope.
7. Determination of thickness of a thin wire by wedge method
8. Determination of refractive index of liquid-Boy's method.

P. Gopal

S. S. Rao

21.3.2018

B Nagamani

SRR&CVR GOVERNMENT DEGREE COLLEGE (A), VIJAYWADA-4
Examination at the end of III Semester
Physics paper III: Wave Optics

Model Question Paper

Time: 3 Hrs. Maximum Marks: 60

Section A **5X4=20Marks**

Answer any FIVE of the following questions

1. Explain any one method of minimizing spherical aberration.
2. Discuss the phase change due to reflection of light from the surface of a denser medium.
3. Give the difference between Fresnel and Fraunhofer diffraction.
4. Write a short note on the law of Malus.
5. Explain the principles of fibre optic communication.
6. In a Newton's rings experiment the diameter of the 5^{th} ring was 0.3cm and the diameter of 25^{th} ring was 0.8 cm. If the radius of curvature of the plano convex lens is 100cm, find the wavelength of the incident light.
7. A grating has 15 cm of the surface ruled with 6000 lines per cm. What is the resolving power of grating in the first order.
8. Calculate the thickness of a quarter wave plate made of quartz to be used with sodium light $\lambda = 6000$ A.U and $m_0 = 1.544$ and $m_e = 1.553$.

Section B

Answer the following questions **5X8= 40 Marks**

9 (a). What is chromatic aberration? Obtain an expression for the chromatic aberration of a lens. Derive the condition for achromatism when two lenses are in contact.

(or)

9 (b). Explain the defects 'coma' and 'astigmatism' in a lens. How are they reduced?

10 (a). Describe Fresnel's biprism method of producing interference fringes and explain how you will determine the wavelength of light using biprism.

(or)

10 (b) Describe the principle, construction and working of Michelson's interferometer. Mention its uses.

11 (a) Explain Fraunhofer diffraction due to a single slit and deduce the position of maxima and minima. Draw the representative graph of the intensity distribution

(or)

11 (b) Give the construction and action of a zone plate with necessary theory. Compare it with convex lens.

12 (a) Explain the construction and working of a Nicol prism.

(or)

12 (b) What is optical activity? Explain the working of Babinet compensator.

13(a) Explain the principle and working of He-Ne laser.

(or)

13 (b) Explain how a hologram is prepared and viewed. Mention four applications of holography

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J. S. [signature] 21.3.2018

B Nagamani

SRR & CVR GOVT. DEGREE COLLEGE (A)

VIJAYAWADA – 520 004

B.Sc. 4 th Semester Physics

(w.e.f 2018-2019)

Paper IV: Thermodynamics & Radiation Physics

BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	
Unit II	2 (with internal choice)	1	1
Unit III	2 (with internal choice)	2	
Unit IV	2 (with internal choice)	1	1
Unit V	2 (with internal choice)	1	1

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T. S. R. [illegible] 21.3.2018

B Nagamani

Model question Paper for all theory papers

Time : 3 hrs

Max marks : 60M

Section-A (Essay type)

Answer All questions with internal choice from all units (I to V). Marks : 5 X 8 M = 40 M

(Two questions are to be set from each unit with internal choice)

Section-B (Short answer type)

Answer any five out of 10 questions from all units (I to V) **Marks: 5 x 4M = 20 M**

At least two questions should be set from each unit.

(At least three problems should be given.)

P. Sirisha
21-3-2019

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SRR&CVR Government Degree College (A), Vijayawada
Physics Paper IV: Thermodynamics &Radiation Physics
IV SEMESTER

4 hrs/week

Work load: 60 hrs per semester

UNIT-I (10 hrs)

1. Kinetic theory of gases
Introduction –Deduction of Maxwell's law of distribution of molecular speeds, Transport phenomena – Mean free path - Viscosity of gases-thermal conductivity-diffusion of gases.

UNIT-II(12 hrs)

2. Thermodynamics
Introduction- Isothermal and adiabatic process- Reversible and irreversible processes- Carnnot's engine and its efficiency-Carnot's theorem-Second law of thermodynamics. Kelvin's and Claussius statements-Entropy, physical significance –Change in entropy in reversible and irreversible processes-Entropy and disorder-Entropy of Universe– Temperature-Entropy (T-S) diagram and its uses –

UNIT-III(12 hrs)

3. Thermodynamic potentials and Maxwell's equations
Thermodynamic potentials-Derivation of Maxwell's thermodynamic relations-Clausius- Clayperon's equation-Derivation for ratio of specific heats-Derivation for difference of two specific heats for perfect gas.Joule Kelvin effect-expression for Joule Kelvin coefficient for perfect

UNIT-IV(12 hrs)

4. Low temperature Physics
Introduction-Joule Kelvin effect-Porous plug experiment - Joule expansion-Distinction between adiabatic and Joule Thomson expansion-Expression for Joule Thomson cooling- Liquefaction of helium, Kapitza's method-Adiabatic demagnetization, -applications of substances at low temperature-effects of chloro and fluoro carbons on ozone layer.

UNIT-V(14 hrs)

5. Quantum theory of radiation
Blackbody-Ferry's black body-distribution of energy in the spectrum of black body-Wein's displacement law,Wein's law, Rayleigh-Jean's law(Qualitative treatment)-Quantum theory of radiation-Planck's law-Measurement of radiation-Types of pyrometers-Disappearing filament optical pyrometer-experimental determination – Angstrompyrheliometer-determination of solar constant, Temperature of Sun.

REFERENCE BOOKS:
1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad

T.S.R.K 21.3.2018 & P. Gopal

B Nagamani

2. Thermodynamics, R.C.Srivastava, S.K.Saha& Abhay K.Jain, Eastern Economy Edition

3. Unified Physics Vol.2, Optics & Thermodynamics, Jai Prakash Nath&Co.Ltd., Meerut
4. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007
5. Heat, Thermodynamics and Statistical Physics-N Brij Lal, P Subrahmanyam, PS Hemne, S.Chand& Co.,2012
6. Heat and Thermodynamics- MS Yadav, Anmol Publications Pvt. Ltd, 2000
7. University Physics, HD Young, MW Zemansky,FW Sears, Narosa Publishers, New Delhi

Practical Paper IV: Thermodynamics & Radiation Physics

Work load: 30 hrs **2 hrs/week**

Minimum of 6 experiments to be done and recorded

1. Thermal conductivity of bad conductor-Lee's method
2. Measurement of Stefan's constant.
3. Verify Newton's law of cooling
4. Heating efficiency of electrical kettle with varying voltages.
5. Thermoemf- thermo couple
6. Thermal behavior of an electric bulb (filament/torch light bulb)
7. Study of variation of resistance with temperature - thermistor.
8. Determination of wavelength of laser light using diffraction grating.

SYLLABUS UP GRADATION

PHYSICS

2018-2019

Paper	Syllabus revision	justification
paper III: Wave Optics	Deletion: difference between interference and diffraction, Laurent half shape polarimeter	Already covered in intermediate
paper IIIp: Wave Optics lab	Deletion: Study of optical rotation - polarimeter, refractive index of liquid - hallow prism	Already covered in intermediate
paper IV: thermodynamics & Radiation Physics	Deletion: Change of entropy of a perfect gas, Rayleigh jeans law (derivation)	Already covered in intermediate
Practical paper IVp: thermodynamics & Radiation Physics lab	Deletion: Specific heat of liquid - Barton's radiation correction, thermal conductivity of rubber	Similar experiment was already included in the syllabus

SRR&CVR GOVERNMENT DEGREE COLLEGE (A), VIJAYWADA-4

Examination at the end of IV Semester

Physics Paper IV: Thermodynamics & Radiation Physics

Model Question Paper

Time: 3 Hrs. Maximum Marks: 60

Section A

5X4=20 Marks

Answer any FIVE of the following questions

1. State the postulates of kinetic theory of gases.

2. Obtain the first T-dS equation.

3. Derive an expression for the ratio of two specific heats.

4. Explain the working of a vapour compression machine.

5. Describe Fery's black body.

6. The average speed of nitrogen molecule at N.T.P is 450m/s. If density is 1.25 kg/m^3,coefficient of viscosity is 1.66×10^{-5} MKS unit, calculate the mean free path of nitrogen molecules.

7. Find the increase in entropy when 10g of ice at 0°c is converted into water at the same temperature, given that the latent heat of fusion of ice is 80 cal/gm.

8. Calculate the energy radiated per minute from the filament of an incandescent lamp at 2000K if the surface area is 5×10^{-5} m^2 and its relative emission e is 0.85.Given that $\sigma=5.7\times10^{-8}$ M.K.S units.

Section B

Answer the following questions **5X8= 40 Marks**

9 (a). On the basis of kinetic theory, derive an expression for the viscosity of a gas

(or)

9 (b). On the basis of kinetic theory, derive an expression for the thermal conductivity of a gas.

10 (a). Describe the working of Carnot's engine and derive an expression for its efficiency.

(or)

10 (b). Carnnot's reversible engine and its efficiency.

11 (a). Define the four thermodynamic potentials. Use them to derive Maxwell's Thermodynamic equations.

(or)

11(b). What is the significance of Clausius Claperon's equation? Derive an expression for it and discuss it's applications.

12 (a). What is Joule –Kelvin effect? Describe the porous plug experiment and indicate the result. Obtain an expression for the cooling produced due to this effect.

(or)

12 (b). What is adiabatic demagnetization ?How is this principle used in producing low temparature?

13 (a). State Planck's hypothesis and deduce Plank's law.

(or)

13 (b). Define Solar Constant. Explain with necessary theory how the solar constant is determined. How is the temperature of the Sun estimated from the data of the solar constant ?

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21-3-2018