

Date: 02.11.2022



CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY : CHENNAI - 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

November 2022 - April 2023 (SEMESTER I)

UG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Induction Programme	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1	B E / B.Tech (Full Time)	I	14.11.2022	28.11.2022	23.03.2023	25.03.2023	05.04.2023
2	B Arch.(Full Time)	I	14.11.2022	28.11.2022	15.03.2023	25.03.2023	05.04.2023
3	B E / B Tech (Part Time)	I	-	14.11.2022	01.03.2023	25.03.2023	05.04.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 15.05.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations)
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.


DIRECTOR
ACADEMIC COURSES



RVS COLLEGE OF ENGINEERING AND TECHNOLOGY

COIMBATORE - 641 402

DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2022-23 [EVEN SEMESTER]

ACADEMIC CALENDAR



MONTH / DAY	DATE	JANUARY '23	DATE	FEBRUARY '23	DATE	MARCH '23	DATE	APRIL '23	DATE	MAY '23	DATE	JUNE '23
MON									1	May Day/ Holiday		
TUE									2	Project 3 rd Review		
WED			1	Department Staff Meeting	1				3	Department Staff Meeting		
THU			2		2				4	Third Class Committee Meeting for II, III, IV year students	1	
FRI			3	Workshop on Entrepreneurship	3				5	Commencement of Model Exam for II, III, IV Year Classes	2	
SAT			4	Holiday	4	Holiday	1	End of Internal Assessment Test-II for II, III, IV Year Classes	6	Holiday	3	Holiday
SUN	1	Holiday	5	Holiday	5	Holiday	2	Holiday	7	Holiday	4	Holiday
MON	2		6		6	End of Internal Assessment Test-I for II, III, IV Year Classes/Faculty Logbook Submission	3		8		5	Commencement of End Semester Examinations
TUE	3		7	First Class Committee Meeting for II, III, IV year	7		4	Matrika Jayanthi/ Holiday	9		6	
WED	4		8	Project 0 th Review	8	WOMEN'S DAY	5	Submission of Internal Assessment Test-II Result Analysis/Department Staff Meeting	10		7	
THU	5		9		9	Seminar	6		11		8	
FRI	6		10	Field Visit	10	Submission of Internal Assessment Test-I Result Analysis	7	Good Friday/ Holiday	12		9	
SAT	7		11		11	Second Class Committee Meeting for II, III, IV year students	8	Guest Lecture/ Seminar	13		10	
SUN	8	Holiday	12	Holiday	12	Holiday	9	Holiday	14	Holiday	11	Holiday

MONTH / DAY	DATE	JANUARY '23	DATE	FEBRUARY '23	DATE	MARCH '23	DATE	APRIL '23	D.	MAY '23	DATE	JUNE '23
MON	9		13	Department Staff Meeting	13		10		15		12	
TUE	10		14	Guest Lecture	14	Project 1 st Review	11	Project 2 nd Review	16		13	
WED	11		15		15	Department Staff Meeting	12		17	Faculty Logbook Submission	14	
THU	12		16		16		13		18		15	
FRI	13		17	Faculty Logbook Submission	17		14	Tamil New Year/ Holiday	19		16	
SAT	14		18	Holiday	18	Holiday	15	Holiday	20		17	
SUN	15	Holiday	19	Holiday	19	Holiday	16	Holiday	21	Holiday	18	Holiday
MON	16		20		20	Submission of Question Paper for Internal Assessment Test-II	17		22		19	
TUE	17		21		21	Faculty Logbook Submission	18	Faculty Logbook Submission	23	End of Model Exam for III,IV Year Classes	20	
WED	18		22		22	Telugu New Year / Holiday	19		24	Submission of Model Exam Result Analysis/ Last Working Day	21	
THU	19		23	Submission of Question Paper for Internal Assessment Test-I	23		20	Guest Lecture/ Seminar	25		22	
FRI	20		24		24		21		26	Commencement of University Practical Examinations	23	
SAT	21		25	Guest Lecture/ Seminar	25		22	Ramzan/ Holiday	27		24	
SUN	22	Holiday	26	Holiday	26	Holiday	23	Holiday	28	Holiday	25	Holiday

MONTH / DAY	DATE	JANUARY '23	DATE	FEBRUARY '23	DATE	MARCH '23	DATE	APRIL '23	DATE	MAY '23	DATE	JUNE '23
MON	23		27	Commencement of Internal Assessment Test-I for II,III,IV Year Classes	27	Commencement of Internal Assessment Test-II for II,III,IV Year Classes	24		29		26	
TUE	24		28		28		25	Guest Lecture/ Sem'nar	30		27	
WED	25				29		26		31		28	
THU	26				30	Faculty Logbook Submission	27	Submission of Question Paper For Model Exam			29	
FRI	27				31	Technical Symposium	28				30	
SAT	28						29	Faculty Logbook Submission				
SUN	29						30					
MON	30	Commencement of classes for II,III and IV year students										
TUE	31											
Monthly working days		2		22		24		20		19		

V.R. Sivakumar
HOD-Mech

V. R. SIVAKUMAR, M.E., Ph.D.,
Head of the Department,
Department of Mechanical Engineering,
RVS College of Engg. & Tech.,
Coimbatore- 641 402.

P. Jayaram
PRINCIPAL

RVS COLLEGE OF ENGINEERING AND TECHNOLOGY, COIMBATORE
INTERNAL ASSESSMENT TEST – II October-'22)
SUB.CODE & NAME – EC8701& ANTENNAS AND MICROWAVE ENGINEERING

Year/Class/SEM: IV ECE/07
Date/Session: 10/10/2022/FN

Duration: 90 Mins
Max. Marks: 50

Answer ALL the Questions
Part - A (5 X 2 = 10marks)

1. Interpret the meaning of array factor. (CO3,K1)(N/D 17)
2. Differentiate Binomial and Chebyshev distributions. (CO3,K3)
3. Point out the limitations of a microstrip patch antenna. (CO2,K3)
4. At 2.7GHz, the increase in antenna temperature from Cygnus A with a 20m dish antenna is 51k. Solve the aperture efficiency of the antenna (CO2,K3)
5. Compare absolute gain and realized gain. (CO3,K1) (N/D 20)

Part - B (2x13=26 Marks)

6. ai. Summarize the Friis equation of an antenna with diagram. Also explain the individual parameters in the equation in detail. (7)(CO1,K2) (A/M'18)
ii. Investigate the need of impedance matching in antennas (6).

OR

- (b) Illustrate the concept of (a) Bandwidth (b) Beam efficiency (c) Antenna Temperature. (7) (CO1,K2) (A/M'21)
- ii. Show the condition under which the fields are classified as near field and far field and explain the same (6) (CO1,K2) (A/M'21)

7. a. With necessary sketches, explain in detail the radiation mechanism of a microstrip patch antenna. (CO2,K2) (13) (ND 20)

OR

- (b) Demonstrate the radiation mechanisms of broad side antenna array and end fire antenna array with neat sketches. (13) (CO3,K2) (N/D 20)

Part - C (1x14=14 Marks)

8. Identify the direction of maximum and minimum radiation from the resultant radiation of two identical radiators which are spaced $d = 3\lambda/4$ meters apart and fed with currents of equal magnitude but with 180° phase difference. (CO3,K3) (A/M '21)


Prepared by


Approved by



R.V.S. COLLEGE OF ENGINEERING AND TECHNOLOGY, Coimbatore - 641 402.
(Approved by AICTE and Affiliated to ANNA UNIVERSITY)

INTERNAL TEST -02

REGISTER NUMBER

7 1 2 8 1 9 1 0 6 0 0 3

Name of the Candidate		R. Dwaipandi.			
Degree / Branch / Section		BE / Electronics and Communication Engineering			
Subject Code / Name		EC 8701 / Antennas and Microwave Engineering			
Semester	07	Date / Session	10/10/2022 & FN	No. of pages Used	12
Name of the Invigilator		V. Kavitha			
Signature of the Invigilator with date		[Signature] 10/10/22			

PART - A	
1	2
2	2
3	0
4	2
5	0
Part - A Sub Total (10)	06

PART - B				
Q. No.	(i)	(ii)	(iii)	Total
6. (a)	07		05	12
6. (b)				
7. (a)				
7. (b)	9			9
8. (a)	2			2
8. (b)				
Part - B Sub Total (40)				23

Grand Total Out of 50	29
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Name of the Faculty	M. S. Vadim
Signature of the Faculty with date	[Signature]

Part-A

1. Interpret the meaning of array factor.

* The meaning of array factor is nothing but minimal set of the lines are drawn in perpendicular of the antennas.

* That is called Interpret the array factor.

* The Array factor was mainly due to two main things, are, Broad side antenna array and end fire antenna array.

2. Binomial:-

* The define as the Binomial are it is refers to the non-uniform antennas are include on the array factor.

Chebyshev distributions:-

* The chebyshev distribution are refers on the, it is uniform antennas are includes on the array factor.

* Chebyshev distributed in the 38 Hz to 5.8 GHz.

3. Microstrip Patch Antenna

* The microstrip antenna was used in the telecommunication devices.

* The primary microstrip was device on the post.

* Patch are losses in the many companies.

* That is called as the Microstrip Patch antenna.

4. Given

Increase antenna \rightarrow 2.7 GHz.

A with \rightarrow 20m dish.

Antenna \rightarrow 51K.

$$\text{Aperture efficiency antenna} = \frac{G_d P_t}{4\pi R^2} = \frac{2.7 \times 20}{4\pi (51)^2}$$

$$= 5.718$$

5. Absolute gain:

The absolute gain is the sphere

of the circular from radius.

Realized gain:

The realized gain is the radius of the circular.

**Branch Name B.E. Civil Engineering**

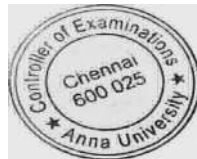
<i>Semester</i>	<i>Subject Code</i>	<i>Subject Name</i>	<i>Exam Date</i>	<i>Session</i>
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3252	Basic Electrical, Electronics and Instrumentation Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	PH3201	Physics for Civil Engineering	12-JAN-23	F.N.
03	CE3351	Surveying and Levelling	29-DEC-22	F.N.
03	ME3351	Engineering Mechanics	02-JAN-23	F.N.
03	CE3301	Fluid Mechanics	04-JAN-23	F.N.
03	CE3302	Construction Materials and Technology	06-JAN-23	F.N.
03	MA3351	Transforms and Partial Differential Equations	09-JAN-23	F.N.
03	CE3303	Water Supply and Wastewater Engineering	11-JAN-23	F.N.

Branch Name B.E. Computer Science and Engineering

<i>Semester</i>	<i>Subject Code</i>	<i>Subject Name</i>	<i>Exam Date</i>	<i>Session</i>
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3251	Basic Electrical and Electronics Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	CS3251	Programming in C	10-JAN-23	F.N.
02	PH3256	Physics for Information Science	12-JAN-23	F.N.
03	CS3351	Digital Principles and Computer Organization	29-DEC-22	F.N.
03	CS3301	Data Structures	02-JAN-23	F.N.
03	CS3391	Object Oriented Programming	04-JAN-23	F.N.
03	CS3352	Foundations of Data Science	06-JAN-23	F.N.
03	MA3354	Discrete Mathematics	09-JAN-23	F.N.

FN: FORENOON (10.00 A.M. TO 01. 00 P.M.)

AN:AFTERNOON (02.00 P.M. TO 5.00 P.M.)

*P. Senthilvel*

CONTROLLER OF EXAMINATIONS



(Except for the candidates admitted in 2022)

CHOICE BASED CREDIT SYSTEM (CBCS)

Branch Name B.E. Electrical and Electronics Engineering

<i>Semester</i>	<i>Subject Code</i>	<i>Subject Name</i>	<i>Exam Date</i>	<i>Session</i>
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	EE3251	Electric Circuit Analysis	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	BE3255	Basic Civil and Mechanical Engineering	10-JAN-23	F.N.
02	PH3202	Physics for Electrical Engineering	12-JAN-23	F.N.
03	CS3353	C Programming and Data Structures	29-DEC-22	F.N.
03	EE3302	Digital Logic Circuits	02-JAN-23	F.N.
03	EE3303	Electrical Machines - I	04-JAN-23	F.N.
03	EE3301	Electromagnetic Fields	06-JAN-23	F.N.
03	EC3301	Electron Devices and Circuits	09-JAN-23	F.N.
03	MA3303	Probability and Complex Functions	11-JAN-23	F.N.

Branch Name B.E. Electronics and Communication Engineering

<i>Semester</i>	<i>Subject Code</i>	<i>Subject Name</i>	<i>Exam Date</i>	<i>Session</i>
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3254	Electrical and Instrumentation Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	EC3251	Circuit Analysis	10-JAN-23	F.N.
02	PH3254	Physics for Electronics Engineering	12-JAN-23	F.N.
03	CS3353	C Programming and Data Structures	29-DEC-22	F.N.
03	EC3354	Signals and Systems	02-JAN-23	F.N.
03	EC3351	Control Systems	04-JAN-23	F.N.
03	EC3352	Digital Systems Design	06-JAN-23	F.N.
03	MA3355	Random Processes and Linear Algebra	09-JAN-23	F.N.
03	EC3353	Electronic Devices and Circuits	11-JAN-23	F.N.

FN: FORENOON (10.00 A.M. TO 01. 00 P.M.)
AN:AFTERNOON (02.00 P.M. TO 5.00 P.M.)*P. Senthilvel*

CONTROLLER OF EXAMINATIONS

21/12 FR

Reg. No. :

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Question Paper Code : 90484

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Seventh Semester

Electronics and Communication Engineering

EC 8701 — ANTENNAS AND MICROWAVE ENGINEERING

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Calculate the far field for a half wave dipole antenna operating at a frequency of 300MHz.
2. Write the Friis transmission equation and mention the significance.
3. Define Directivity and maximum effective aperture of an infinite small dipole?
4. Name any two aperture antennas and mention the difference.
5. Explain the principle Pattern Multiplication.
6. Compare Broadside and End fire arrays.
7. List any two applications of Magic Tee.
8. Why slow wave structures are used in TWT?
9. What is the need for impedance matching in microwave circuits?
10. What will be the two possible values of LO frequency, for a down-conversion mixer with input RF frequency of 5GHz and desired intermediate frequency of 500 MHz?

PART B — (5 × 13 = 65 marks)

11. (a) Draw the radiation pattern of any one microwave antenna and explain the following:
 - (i) Main lobe
 - (ii) Sidelobes
 - (iii) Backlobes
 - (iv) HPBW
 - (v) FNBW

Or

(4+3+3+3)

(b) Define and mention the significance of the following antenna parameters with relevant formulas:

- (i) Antenna Gain
- (ii) Antenna Efficiency
- (iii) Effective Area
- (iv) Antenna Noise Temperature

(4+3+3+3)

12. (a) Derive expressions for the fields radiated from a half wave Dipole and determine its radiation resistance.

Or

(b) Explain the principle of operation of parabolic reflector antenna and detail about the different types of feeding techniques applied.

13. (a) Derive the field strength and draw the radiation pattern of two isotropic point sources separated by $d = \lambda/2$ with equal amplitude and phase.

Or

(b) Consider a uniform linear array with two isotropic point sources having $\lambda/2$ spacing between them and fed with currents of equal magnitude and opposite phase. Derive expression for its array factor and draw its radiation pattern.

14. (a) Explain the principle of operation of Magic Tee and derive its S matrix.

Or

(b) With neat diagram, explain the construction and operating principle of TWT amplifier.

15. (a) Define Power Gain, Available power gain and Transducer power gain. Derive expressions for these power gains in terms of S parameters.

Or

(b) Explain the principle of obtaining frequency up conversion and down conversion using mixer.

PART C — (1 × 15 = 15 marks)

16. (a) A log-periodic dipole array antenna is to be designed for frequency range of 800 MHz to 2000 MHz for a directivity of 9 dBi. The optimum values of ζ and σ are 0.86 and 0.16, respectively. A wire of 0.1 cm diameter is to be used. Calculate the approximate lengths of the longest and shortest dipoles that are to be used, the number of elements in the array and lengths of each array element.

Or

(b) Design a rectangular microstrip antenna for WiFi application at 2.4415 GHz. Choose a substrate material with $\epsilon_r = 2.32$; $h = 0.16$ cm; $\tan \delta = 0.001$.