JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
Pichanur, Coimbatore-641 105 Tamil Nadu INDIA Phone: +91 422 2636900 Fax: +91 422 2636901 Email: info@jct.ac.in www.jct.ac.in

CRITERION 1

1.1.1 The institution ensures effective curriculum delivery through a well-planned and documented

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PRINCIPAL
JCT College of Engineering & Technology
PICHANUR, COIMBATORE - 641 105.

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Academic Schedule

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Date: 25.10.2021

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

November 2021 – March 2022 (SEMESTER I)

UG (FT) 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	08.11.2021	22.11.2021	08.03.2022	10.03.2022	21.03.2022

RE-OPENING DAY FOR THE NEXT SEMESTER: 18.04.2022 (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

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

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Date: 04.03.2022

REVISED

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI - 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

March 2022 – June 2022 (Even Semester – Except Semester II)

UG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech (Full-Time)	IV,VI,VIII	16.03.2022	16.06.2022**	18.06.2022	28.06.2022
2.	B.E. / B.Tech (Part-Time)	IV,VI				
3.	B.Arch. (Full-Time)	IV,VI,VIII,X				

RE - OPENING DAY FOR THE NEXT SEMESTER: 10.08.2022 (Wednesday)

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.

**** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.**

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	19.03.2022	Tuesday
2.	26.03.2022	Wednesday
3.	09.04.2022	Thursday
4.	23.04.2022	Friday
5.	30.04.2022	Tuesday
6.	07.05.2022	Monday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
7.	14.05.2022	Tuesday
8.	21.05.2022	Wednesday
9.	28.05.2022	Thursday
10.	04.06.2022	Friday
11.	11.06.2022	Monday

04/03/2022

DIRECTOR
ACADEMIC COURSES

DAC - SB

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Date: 27.07.2021

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON AUTONOMOUS AFFILIATED COLLEGES

August 2021 – December 2021 (ODD SEMESTER)*

UG & PG Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech (Full-Time)	III, V, VII	18.08.2021	30.11.2021**	02.12.2021	13.12.2021
2.	B.E. / B.Tech (Part-Time)	III, V, VII				
3.	B.Arch. (Full-Time)	III, V, VII, IX				
4.	M.C.A. (Full-Time)	V				
5.	M.Sc (5 Yrs-Integrated)	V, VII, IX				
6.	M.B.A. (5 Yrs-Integrated)	V, VII, IX				

* As per the directives of the Government of Tamil Nadu, the classes will be conducted in ONLINE mode

RE - OPENING DAY FOR THE NEXT SEMESTER: 19.01.2022 (Wednesday)

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.

** In order to ensure minimum no. of working days, the following 7 Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1	28.08.2021	Friday
2	11.09.2021	Monday
3	25.09.2021	Friday
4	09.10.2021	Thursday
5	23.10.2021	Friday
6	06.11.2021	Tuesday
7	20.11.2021	Thursday

DIRECTOR
ACADEMIC COURSES

DAC - 58

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

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Date: 25.10.2021

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

November 2021 – March 2022 (SEMESTER I)

UG (FT) 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	08.11.2021	22.11.2021	08.03.2022	10.03.2022	21.03.2022

RE-OPENING DAY FOR THE NEXT SEMESTER: 18.04.2022 (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

DAC - SB

Academic Calendar

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
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JCT COLLEGE OF ENGINEERING AND TECHNOLOGY				
PICHANUR, COIMBATORE -641 105				
Academic Calendar for III ,V and VII Sem B.E/B.Tech for ODD Semester 2021-2022				
Date	**Day**	**Particulars**	**Total Days**	
13.08.2021	FRI			
14.08.2021	SAT			
15.08.2021	SUN	**Independence day**		
16.08.2021	MON			
17.08.2021	TUE			
18.08.2021	WED	**Commencement of Classes**	01	
19.08.2021	THU		02	
20.08.2021	FRI	**Moharam**		
21.08.2021	SAT	**Onam**		
22.08.2021	SUN	**Holiday**		
23.08.2021	MON		03	
24.08.2021	TUE		04	
25.08.2021	WED		05	
26.08.2021	THU		06	
27.08.2021	FRI		07	
28.08.2021	SAT		08	
29.08.2021	SUN	**Holiday**		
30.08.2021	MON	**Krishna Jayanthi**		
31.08.2021	TUE		09	
		Total Working days	**09**	
Date	**Day**	**Particulars**	**Total Days**	
01.09.2021	WED		10	
02.09.2021	THU		11	
03.09.2021	FRI		12	
04.09.2021	SAT		13	
05.09.2021	SUN	**Holiday**		
06.09.2021	MON		14	
07.09.2021	TUE	**Class Committee Meeting-I**	15	
08.09.2021	WED		16	
09.09.2021	THU		17	
10.09.2021	FRI	**Vinayagar Chathurthi**		

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11.09.2021	SAT		18	
12.09.2021	SUN	**Holiday**		
13.09.2021	MON		19	
14.09.2021	TUE		20	
15.09.2021	WED		21	
16.09.2021	THU		22	
17.09.2021	FRI		23	
18.09.2021	SAT		24	
19.09.2021	SUN	**Holiday**		
20.09.2021	MON		25	
21.09.2021	TUE		26	
22.09.2021	WED		27	
23.09.2021	THU		28	
24.09.2021	FRI		29	
25.09.2021	SAT		30	
26.09.2021	SUN	**Holiday**		
27.09.2021	MON		31	
28.09.2021	TUE		32	
29.09.2021	WED		33	
30.09.2021	THU		34	
		Total Working days	**25**	
Date	Day	**Particulars**	**Total Days**	
01.10.2021	FRI		**35**	
02.10.2021	SAT	**GANDHI JAYANTHI**		
03.10.2021	SUN	**Holiday**		
04.10.2021	MON	**Internal Test-I**	**36**	
05.10.2021	TUE	**Internal Test-I**	**37**	
06.10.2021	WED	**Internal Test-I**	**38**	
07.10.2021	THU		**39**	
08.10.2021	FRI		**40**	
09.10.2021	SAT	**Class Committee Meeting-II**	**41**	
10.10.2021	SUN	**Holiday**		
11.10.2021	MON	**Intimation Letter to Parents**	**42**	
12.10.2021	TUE		**43**	
13.10.2021	WED		**44**	
14.10.2021	THU	**Pooja Holiday**		
15.10.2021	FRI	**Pooja Holiday**		

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16.10.2021	SAT		45	
17.10.2021	SUN	**Holiday**		
18.10.2021	MON		46	
19.10.2021	TUE	**Miladi Nabi**		
20.10.2021	WED		47	
21.10.2021	THU		48	
22.10.2021	FRI		49	
23.10.2021	SAT		50	
24.10.2021	SUN	**Holiday**		
25.10.2021	MON		51	
26.10.2021	TUE		52	
27.10.2021	WED		53	
28.10.2021	THU		54	
29.10.2021	FRI		55	
30.10.2021	SAT		56	
31.10.2021	SUN	**Holiday**		
		Total Working days	22	
Date	Day	**Particulars**	**Total Days**	
01.11.2021	MON		57	
02.11.2021	TUE		58	
03.11.2021	WED	**Internal Test-II**	59	
04.11.2021	THU	**Internal Test-II**	60	
05.11.2021	FRI	**Internal Test-II**	61	
06.11.2021	SAT		62	
07.11.2021	SUN	**Holiday**		
08.11.2021	MON		63	
09.11.2021	TUE	**Class Committee Meeting-III**	64	
10.11.2021	WED	**Intimation Letter to Parents**	65	
11.11.2021	THU		66	
12.11.2021	FRI		67	
13.11.2021	SAT		68	
14.11.2021	SUN	**Holiday**		
15.11.2021	MON		69	
16.11.2021	TUE		70	
17.11.2021	WED		71	
18.11.2021	THU		72	
19.11.2021	FRI		73	

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20.11.2021	SAT		74	
21.11.2021	SUN	Holiday		
22.11.2021	MON		75	
23.11.2021	TUE		76	
24.11.2021	WED		77	
25.11.2021	THU		78	
26.11.2021	FRI		79	
27.11.2021	SAT	Internal Test-III	80	
28.11.2021	SUN	Holiday		
29.11.2021	MON	Internal Test-III	81	
30.11.2021	TUE	Internal Test-III / Last Working Day	82	
01.12.2021	WED	Total Working days	26	
02.12.2021	THU	Commencement of Practical Exam		
03.12.2021	FRI			
04.12.2021	SAT			
05.12.2021	SUN	Holiday		
06.12.2021	MON			
07.12.2021	TUE			
08.12.2021	WED			
09.12.2021	THU			
10.12.2021	FRI			
11.12.2021	SAT			
12.12.2021	SUN	Holiday		
13.12.2021	MON	Commencement of End Semester Exam		
14.12.2021	TUE			

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JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
PICHANUR, COIMBATORE -641 105
Academic Calendar for I Year B.E./B.Tech (EVEN Semester 2021-2022)

Date	Day	Particulars	Total Days
01.04.2022	FRI		
02.04.2022	SAT	TELUGU NEW YEAR DAY	
03.04.2022	SUN	HOLIDAY	
04.04.2022	MON	College Reopens for I B.E./B.Tech - Even Semester	1
05.04.2022	TUE		2
06.04.2022	WED		3
07.04.2022	THU		4
08.04.2022	FRI		5
09.04.2022	SAT		6
10.04.2022	SUN	HOLIDAY	
11.04.2022	MON		7
12.04.2022	TUE		8
13.04.2022	WED		9
14.04.2022	THU	TAMIL NEW YEAR DAY	
15.04.2022	FRI	GOOD FRIDAY	
16.04.2022	SAT	HOLIDAY	
17.04.2022	SUN	HOLIDAY	
18.04.2022	MON		10
19.04.2022	TUE		11
20.04.2022	WED	Unit I Completion	12
21.04.2022	THU		13
22.04.2022	FRI		14
23.04.2022	SAT		15
24.04.2022	SUN	HOLIDAY	
25.04.2022	MON		16
26.04.2022	TUE		17
27.04.2022	WED		18
28.04.2022	THU		19
29.04.2022	FRI	First Class Committee meeting	20
30.04.2022	SAT		21
		Total Working days	21

Date	Day	Particulars	Total Days
01.05.2022	SUN	MAY DAY – HOLIDAY	
02.05.2022	MON		22
03.05.2022	TUE	EID-UZ-ZUHA(Tidal Flor)	
04.05.2022	WED		23
05.05.2022	THU	Unit II Completion	24
06.05.2022	FRI		25
07.05.2022	SAT	Last date to pay Tuition fee for I year B.E/B.Tech	26
08.05.2022	SUN	HOLIDAY	
09.05.2022	MON	INTERNAL EXAM-II	27
10.05.2022	TUE	INTERNAL EXAM-II	28
11.05.2022	WED	INTERNAL EXAM-II	29
12.05.2022	THU		30
13.05.2022	FRI	REVIEW OF INTERNAL TEST II	31
14.05.2022	SAT		32
15.05.2022	SUN	HOLIDAY	
16.05.2022	MON	Second class committee meeting	33
17.05.2022	TUE		34
18.05.2022	WED		35
19.05.2022	THU	Unit III Completion	36

20.05.2022	FRI		37
21.05.2022	SAT		38
22.05.2022	SUN	HOLIDAY	
23.05.2022	MON		39
24.05.2022	TUE		40

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25.05.2022	WED		41
26.05.2022	THU		42
27.05.2022	FRI		43
28.05.2022	SAT		44
29.05.2022	SUN	HOLIDAY	
30.05.2022	MON		45
31.05.2022	TUE		46
		Total Working days	35

Date	Day	Particulars	Total Days
01.06.2022	WED		47
02.06.2022	THU	Unit IV Completion	48
03.06.2022	FRI	Third class committee meeting	49
04.06.2022	SAT		50
05.06.2022	SUN	HOLIDAY	
06.06.2022	MON	INTERNAL EXAM-II	51
07.06.2022	TUE	INTERNAL EXAM-II	52
08.06.2022	WED	INTERNAL EXAM-II	53
09.06.2022	THU		54
10.06.2022	FRI	REVIEW OF INTERNAL TEST II	55
11.06.2022	SAT		56
12.06.2022	SUN	HOLIDAY	
13.06.2022	MON		57
14.06.2022	TUE		58
15.06.2022	WED		59
16.06.2022	THU		60
17.06.2022	FRI		61
18.06.2022	SAT	Unit V Completion	62
19.06.2022	SUN	HOLIDAY	
20.06.2022	MON	REVISION CLASS	63
21.06.2022	TUE	REVISION CLASS	64
22.06.2022	WED	REVISION CLASS	65
23.06.2022	THU	REVISION CLASS	66
24.06.2022	FRI	Fourth class committee meeting	67
25.06.2022	SAT	REVISION CLASS	68
26.06.2022	SUN	HOLIDAY	
27.06.2022	MON	MODEL EXAM	69
28.06.2022	TUE	MODEL EXAM	70
29.06.2022	WED	MODEL EXAM	71
30.06.2022	THU	MODEL EXAM	72
		Total Working days	26

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

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Date	Day	Particulars	Total Hours
01.07.2022	FRI	INTERNAL EXAM	7
02.07.2022	SAT	INTERNAL EXAM	24
03.07.2022	SUN	HOLIDAY	
04.07.2022	MON	REVISION OF MODEL EXAM / LAST WORKING DAY	7
05.07.2022	TUE		
06.07.2022	WED	ANNA UNIVERSITY LAB EXAM STARTS	
07.07.2022	THU		
08.07.2022	FRI		
09.07.2022	SAT		
10.07.2022	SUN	BAKRID - HOLIDAY	
11.07.2022	MON		
12.07.2022	TUE		
13.07.2022	WED		
14.07.2022	THU		
15.07.2022	FRI		
16.07.2022	SAT		
17.07.2022	SUN	HOLIDAY	
18.07.2022	MON	ANNA UNIVERSITY THEORY EXAM STARTS	
19.07.2022	TUE		
20.07.2022	WED		
21.07.2022	THU		
22.07.2022	FRI		
23.07.2022	SAT		
24.07.2022	SUN	HOLIDAY	
25.07.2022	MON		
26.07.2022	TUE		
27.07.2022	WED		
28.07.2022	THU		
29.07.2022	FRI		
30.07.2022	SAT		
31.07.2022	SUN	HOLIDAY	
		Total Working Days	3

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Selection of Elective courses

Anna University, Chennai
Office of the Controller of Examinations
Abstract of Elective List - UG

College Code / Name : 7209 - J C T COLLEGE OF ENGINEERING AND TECHNOLOGY

Branch Code / Name : 114 - B.E. Mechanical Engineering

Semester : 08 **University** : AUC **Regulation** : 2017 **Elective Number** : 1

Subject : ME8094 - Computer Integrated Manufacturing Systems

S.No	Register Number/Student code	Name of the Student
1	720918114001	ABDUL BASIDE A
2	720918114002	ABHINAND KRISHNA
3	720918114004	ADIL HASHIM S
4	720918114005	AKASH S
5	720918114006	AKHIL BINOY
6	720918114007	ALTHAF A
7	720918114008	AMAL K S
8	720918114009	AMAL V JAYAPRAKASH
9	720918114010	AMARNATH A
10	720918114011	ANILJITH V P
11	720918114013	ARUN P K
12	720918114014	DEEPAK KUMAR V
13	720918114015	GOKUL M
14	720918114016	HASHIM S K
15	720918114017	IRSHAD I
16	720918114018	JASWIN JAYAKUMAR
17	720918114020	MOHAMMED SAHAL J
18	720918114022	MUHAMMED SHAFAS K A
19	720918114023	PACHAIYARASAN G
20	720918114024	PINJOFFER F THEKKANATH
21	720918114025	PRAVEENRAJ J
22	720918114026	PREMJITH P
23	720918114027	RAGHUL R
24	720918114028	RAHUL P S
25	720918114030	SANJAY V
26	720918114031	SILAMBARASAN G
27	720918114032	SIVALAL M
28	720918114033	SREERAG A
29	720918114034	SRIDHAR K
30	720918114035	SRIDHAR K
31	720918114036	SRIRAM K
32	720918114039	VASUDEVAN K
33	720918114040	VIGNESH M
34	720918114041	VIGNESH S
35	720918114042	VIJAYAKUMAR T
36	720918114043	VISAKH M S
37	720918114044	VISHNNU M
38	720918114045	VISHNU K P
39	720918114047	VYSAG S
40	720918114048	PUGAZHENTHI P
41	720918114301	ANANDU K
42	720918114302	ANSON A A

43	720918114304	TOMCY ROY
44	720918114504	SAMUVEL SEBASTIAN (27-11-1999)
45	720918114901	RITHIN PRAVEEN

Subject : MG8091 - Entrepreneurship Development

S.No	Register Number/Student code	Name of the Student
1	720918114505	ANANTHA KRISHNAN R

Signature of the Principal with seal

PRINCIPAL
JCT College of Engineering & Technology
PICHANUR, COIMBATORE - 641 105.

Anna University, Chennai
Office of the Controller of Examinations
Abstract of Elective List - UG

College Code / Name : 7209 - J C T COLLEGE OF ENGINEERING AND TECHNOLOGY

Branch Code / Name : 114 - B.E. Mechanical Engineering

Semester : 06 **University : AUC** **Regulation : 2017** **Elective Number : 1**

Subject : PR8592 - Welding Technology

S.No	Register Number/Student code	Name of the Student
1	720919114001	ABHIJITH P
2	720919114002	ANIL KUMAR A M
3	720919114003	ASHIN M M
4	720919114004	CHRISTOES DENISHAN V
5	720919114006	GOKUL O M
6	720919114007	GOWTHAM M
7	720919114008	HARIHARAN S
8	720919114009	MOHAMMED SHAHEEN BIN SALEEM
9	720919114010	MUTHUKUMAR M
10	720919114012	NIKHIL RAJ P
11	720919114013	PAVITH RAJ R
12	720919114014	PRADEEP B
13	720919114016	RAJESH KANNAN R
14	720919114017	SHARUN RAJ K
15	720919114019	SRIJIL E
16	720919114020	VINEETH S
17	720919114022	CHANDAN KUMAR
18	720919114023	RITIK KUMAR RAM
19	720919114029	ANIRUDH SADANANDAN
20	720919114034	CHANDAN KUMAR
21	720919114041	RANJEET KUMAR RAM
22	720919114042	ITIHAS KUMAR
23	720919114301	AKSHAI U
24	720919114302	ARAVIND KUMAR G
25	720919114303	ARJUN V U
26	720919114304	ASHWIN K PATHROSE
27	720919114305	FAWAS I
28	720919114306	JAYAFIR SADIQ P
29	720919114308	VASUTHEVAN B
30	720919114309	POORNIMA V M
31	720919114311	AJITHKUMAR R

Signature of the Principal with seal

PRINCIPAL
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Subject Preference & Allocation

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SUBJECT ALLOCATION & PREFERENCE

Name Of the Faculty: Kavyalakshmi A **Department : EEE**

Academic Year: Even Semester (2021-2022)

Theory/Lab	Subject Preferences					Specialization	No. of times handled	Allotted subject by HoD
	S.No.	Class	Semester	Subject Code	Subject Name			
Theory	1	B.E AIDS	II	BE8251	Basics of Electrical and Electronics Engineering	Electrical and Electronics Engineering	0	Basics of Electrical and Electronics Engineering
	2	B.E EEE	IV	BE8402	Transmission and Distribution			Transmission and Distribution
	3	B.E EEE	VI	GE8075	Intellectual Property Rights			Intellectual Property Rights
Lab	1	B.E CSE	II	GE3271	Engineering Practice Laboratory			Engineering Practice Laboratory
	2	B.E PE		BE3272	Basics of Electrical and Electronics Engineering Laboratory			and Electronics Engineering Laboratory
	3	B.E CIVIL						
	4	B.E EEE	IV	BE8412	Technical Seminar			Technical Seminar
	5	B.E EEE	VI	BE8611	Mini Project			Mini Project
	6	B.E EEE	VIII	BE8811	Project			Project

Note: Analysing the competency of staffs in subject chosen based on their possession of Ph.D/Publication/FDP Certification in addition to the M.E Specialization and Allocating the subjects to the faculty based on the number of times handled, result analysis and student's feedback.

HoD/EEE

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Class Timetable

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

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ACADEMIC YEAR: 2021 – 2022 YEAR: II SEM: IV

PERIOD	I	II	TEA BREAK	III	IV	LUNCH BREAK	V	VI	VII	VIII
DAY / TIME	09: 10 – 10:00	10:00 – 10:45		11:00 – 11:45	11:45 – 12:30		01.20 – 02.05	02.05 – 02.50	02.50 – 03.35	03.35 – 04.20
Monday	TE – I	TE – I		KOM	KOM		SNM	SOM	MT – II	MT – II
	M.Prabhu	M.Prabhu		R.Malairaja	R.Malairaja		D. Kavitha	S.Settu	M.VijayaKumar	M.VijayaKumar
Tuesday	SNM	SNM		TE – I	TE – I		SOM	SOM	EM	EM
	D. Kavitha	D. Kavitha		M.Prabhu	M.Prabhu		S.Settu	S.Settu	R.Krishna	R.Krishna
Wednesday	MT – II	MT – II		SOM	SOM		TE – I	TE – I	EM	EM
	M.VijayaKumar	M.VijayaKumar		S.Settu	S.Settu		M.Prabhu	M.Prabhu	R.Krishna	R.Krishna
Thursday	KOM	KOM		SNM	KOM		EM	EM	TE – I	TE – I
	R.Malairaja	R.Malairaja		D. Kavitha	R.Malairaja		R.Krishna	R.Krishna	M.Prabhu	M.Prabhu
Friday	SOM	SOM		SNM	SNM		MT – II	MT – II	KOM	KOM
	S.Settu	S.Settu		D. Kavitha	D. Kavitha		M.VijayaKumar	M.VijayaKumar	R.Malairaja	R.Malairaja
Saturday	EM	EM		KOM	KOM		SOM	SOM	MT – II	MT – II
	R.Krishna	R.Krishna		R.Malairaja	R.Malairaja		S.Settu	S.Settu	M.VijayaKumar	M.VijayaKumar

COURSE	COURSE TITLE	FACULTY INCHARGE	COURSE	COURSE TITLE	FACULTY INCHARGE
ME8492	Kinematics of Machinery	Dr.G.Magesh	ME8451	Manufacturing Technology – II Laboratory	Mr. M.VijayaKumar
MA8452	Statistics and Numerical Methods	Mrs. D. Kavitha	CE8381	Strength of Materials and Fluid Mechanics and Machinery	Mr. S.Thillaikani
ME8451	Manufacturing Technology – II	Mr. M.Vijaya Kumar	HS8461	Advanced Reading and Writing	Mr A. James
ME8491	Engineering Metallurgy	Mr. R.Krishna Kumar		Library	Dr.J.Prabhakaran
CE8395	Strength of Materials for Mechanical Engineers	Mr. S.Settu		Placement	Mr. S.Thillaikani
ME8493	Thermal Engineering- I	Mr. M.Prabhu		CLASS ADVISOR	Mr. S.Thillaikani

TIME TABLE INCHARGE

HOD / MECH

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
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ACADEMIC YEAR: 2021 – 2022 YEAR: III SEM: VI

PERIOD	I	II	TEA BREAK	III	IV	LUNCH BREAK	V	VI	VII	VIII
DAY / TIME	09: 10 – 10:00	10:00 – 10:45		11:00 – 11:45	11:45 – 12:30		01.20 – 02.05	02.05 – 02.50	02.50 – 03.35	03.35 – 04.20
Monday	CAD	CAD		H & P	H & P		FEA	FEA	DTS	DTS
	S.Settu	S.Settu		R.Krishna	R.Krishna		R.Malairaja	R.Malairaja	R.Magendran	R.Magendran
Tuesday	H & P	H & P		DTS	DTS		HMT	HMT	FEA	FEA
	R.Krishna	R.Krishna		R.Magendran	R.Magendran		Dr.I.J.Issac	Dr.I.J.Issac	R.Malairaja	R.Malairaja
Wednesday	DTS	DTS		HMT	HMT		FEA	FEA	CAD	CAD
	R.Magendran	R.Magendran		Dr.I.J.Issac	Dr.I.J.Issac		R.Malairaja	R.Malairaja	S.Settu	S.Settu
Thursday	WT	WT		CAD	CAD		WT	WT	H & P	H & P
	Mr. Anto	Mr. Anto		S.Settu	S.Settu		Mr. Anto	Mr. Anto	R.Krishna	R.Krishna
Friday	HMT	HMT		WT	WT		CAD	CAD	HMT	HMT
	Dr.I.J.Issac	Dr.I.J.Issac		Mr. Anto	Mr. Anto		S.Settu	S.Settu	Dr.I.J.Issac	Dr.I.J.Issac
Saturday	FEA	FEA		DTS	DTS		WT	WT	H & P	H & P
	R.Malairaja	R.Malairaja		R.Magendran	R.Magendran		Mr. Anto	Mr. Anto	R.Krishna	R.Krishna

COURSE CODE	COURSE TITLE	FACULTY INCHARGE	COURSE CODE	COURSE TITLE	FACULTY INCHARGE
ME8691	Computer Aided Design and Manufacturing	Mr. S.Settu	HS8581	Professional Communication	Mr.N.Vasudevan
ME8651	Design of Transmission Systems	Mr.R.Magendran	ME8682	Design and Fabrication Project	Mr. K.Karthik
ME8693	Heat and Mass Transfer	Dr.I.J.Issac prem kumar	ME8681	CAD / CAM Laboratory	Mr. S.Settu
ME8692	Finite Element Analysis	Mr.R.Malairaja		Placement	Mr. R.Krishna kumar
ME8694	Hydraulics and Pneumatics	Mr. R.Krishna kumar		Library	Mr. R.Krishna kumar
PR8592	Welding Technology	Mr.M.Philomin Anto		CLASS ADVISOR	Mr. K.Karthik

TIME TABLE INCHARGE

HOD / MECH

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

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ACADEMIC YEAR: 2021 – 2022 **YEAR: IV** **SEM: VIII**

PERIOD	I	II	TEA BREAK	III	IV	LUNCH BREAK	V	VI	VII	VIII
DAY / TIME	09: 10 – 10:00	10:00 – 10:45		11:00 – 11:45	11:45 – 12:30		01.20 – 02.05	02.05 – 02.50	02.50 – 03.35	03.35 – 04.20
Monday	POM	POM		CIM	CIM		POM	POM	CIM	CIM
	K.Karthik	K.Karthik		M. Anto	M. Anto		K.Karthik	K.Karthik	M. Anto	M. Anto
Tuesday	CIM	CIM		POM	POM		CIM	CIM	POM	POM
	M. Anto	M.Anto		K.Karthik	K.Karthik		M. Anto	M. Anto	K.Karthik	K.Karthik
Wednesday	POM	POM		CIM	CIM		POM	POM	CIM	CIM
	K.Karthik	K.Karthik		M. Anto	M. Anto		K.Karthik	K.Karthik	M. Anto	M. Anto
Thursday										
Friday										
Saturday										

COURSE CODE	COURSE TITLE	FACULTY INCHARGE
MG8591	Principles of Management	Mr. K.Karthik
ME8094	Computer Integrated Manufacturing Systems	Mr. M.Philomin Anto
ME8811	Project Work	Mr. M.Prabhu
CLASS ADVISOR		Mr. M.Prabhu

TIME TABLE INCHARGE

HOD / MECH

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
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Department Meeting

Minutes

JCT

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

PICHANUR, COIMBATORE – 641105

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Name of the Meeting: Department Meeting	Ref.No:ECE/DM/22/04/2022
Venue: Communication Lab	Date: 22/04/2022

Chair Person:
Prof.Vedha Vinodha.D

Members present:

01) Prof.Chandrasekaran .M
02) Prof.Renswick.S
03) Prof.Poornima.R
04)Prof.Babu.K
05) Prof.Mohanapriya.S
06) Prof.Vinodhini.M
07)Prof.Sindhu.A

Sl. No.	Points Discussed	Target Date	Responsibility	Remarks
1	All the Faculties were asked to Enter CIA I marks in ERP	25.04.2022	All staff members	-
2	All the Faculties were asked to prepare the files for IQAC	23.05.2022	All staff members	Processing
3	All the Class advisors were asked to send the Progress Card report to the parents.	-	All Class Advisors	-
4	All the students were asked to come to lab with proper dress code with Lab observation	-	Lab Handling Faculties	-

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Class CommitteeMeeting

Minutes

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
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MINUTES OF THE MEETING

Name of the Meeting: Class Committee Meeting	Ref. No. :EEE/CCM/ 01/JUNE/2022
Venue: Lecture Hall – Computer Lab-I	Date: 10/06/2022

Members Present:

Faculty:

Dr.K.Geetha (HOD/Prof.), Umar Muktar S (AP/EEE), Mr.D.Nagarajan (AP/EEE), ,Mr.P.Sam Jasper (AP/EEE), Mr. T Senthil Prabhu (AP/S&H), Ms. A Kavyalakshmi (AP/EEE), Mrs. Angel Joseph (AP/EEE).

Students:

Abdul Kareem Ansari, Chottu Kumar, Dikul, G Manasa, B Saravanan, M Srikanth.

S. No.	Observations from the students	Name of the Faculty	Corrective steps/ Suggestion
1	**Numerical Methods** • 5 Units has completed • Teaching is good and easy to understand	T Senthil Prabhu	To practice more unsolved sums.
2	**Electrical Machines II** • 5 Unit has completed • Students are Comfortable with the subject • Study materials & 5 Yrs question bank are given	D Nagarajan	
3	**Transmission and Distribution** • 5 Units has been completed. • Able to understand the subject. • Study materials & 5 Yrs question bank are provided.	A Kavyalakshmi	
4	**Measurement and Instrumentation** • 5 Units has been completed. • Easy to understand the subject. • Question bank and answers are given.	P Sam Jasper	
5	**Linear Integrated Circuits and Applications** • 5 Units completed. • Good teaching and easy to understand. • Study materials & 5Yrs QB are given.	Angel Joseph	

6	**Control System** • 5 Units completed. • Problems along with solutions & 5 Yrs Question bank are given. • Easy to understand.	S Umar Muktar	To practice more problems.
7	**Electrical Machines II Laboratory** • Lab experiments 4 completed. • Students are instructed to write records note.	D Nagarajan	Follow Lab rules and regulation. Extra Lab classes are scheduled.
8	**Linear Integrated Circuits Applications Laboratory** • Lab experiments 2 completed. • Students are instructed to write records note.	Angel Joseph	Follow Lab rules and regulation. Extra Lab classes are scheduled.
9	**General Instructions to the students:** • HoD instructed the students to be punctual to the regular classes. • HoD instructed the students to come in proper dress code. • HoD instructed the students to make compulsory attendance for model exams. • HoD discussed points on appearing for semester examination.	Class Mentors	Ensure students attendance and punctuality.
10	**General Request by Students :** Nil	Class Mentors	

Copy to:

3 Principal.
4 All staff members of EEE Department

Prepared By	Ms. A Kavyalakshmi
Approved By	Dr.K.Geetha
Date	10.06.2022
Page No.	2 of 2

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Course File

JCT

JCT COLLEGE OF ENGINEERING AND TECHNOLOGY
PICHANUR, COIMBATORE – 641105

COURSE FILE INDEX

Academic Year: 2021 – 22 Year/Semester: II / IV

Course Code & Title: MA 8402 & PQT Branch: Computer Science & Engg.

SL. No	CONTENTS	SUBMISSION DATE	SIGNATURE FACULTY	SIGNATURE HOD
1.	Vision & Mission of Institute and Department	11/03/22	R. Sl	
2.	PEOs, POs, PSOs	11/03/22	R. Sl	
3.	Time Table of the Faculty	11/03/22	R. Sl	
4.	Student Name List	11/03/22	R. Sl	
5.	Syllabus	11/03/22	R. Sl	11/3/22
6.	Course Information Sheet	11/03/22	R. Sl	
7.	Lesson Plan	11/03/22	R. Sl	
8.	Course materials	11/03/22	R. Sl	
9.	Question Bank	11/03/22	R. Sl	
10.	Previous Question Papers with sampleanswer key	11/03/22	R. Sl	
	CIA - I			
11.	Question Paper with answer key	18/04/2022	R. Sl	
12.	Answer Scripts (Best, Average, Poor)	21/04/2022	R. Sl	26/4/22
13.	Result Analysis	25/04/2022	R. Sl	
	CIA - II			
14.	Question Paper with answer key	19/05/2022	R. Sl	
15.	Answer Scripts (Best, Average, Poor)	21/05/2022	R. Sl	30/5/22
16.	Result Analysis	30/05/2022	R. Sl	
	CIA - III			
17.	Question Paper with answer key			
18.	Answer Scripts (Best, Average, Poor)			
19.	Result Analysis			
	MODEL EXAMINATION			
20.	Question Paper with answer key	13/06/2022	R. Sl	
21.	Answer Scripts (Best, Average, Poor)	16/06/2022	R. Sl	
22.	Result Analysis	22/06/2022	R. Sl	
23.	Assignment questions	24/06/2022	R. Sl	8/7/22
24.	Assignment marks with sample assignments	24/06/2022	R. Sl	
25.	Tutorial questions (with sample sheets)	24/06/2022	R. Sl	
26.	Current End Semester Examination (ESE) Question Paper with feedback	08/07/2022	R. Sl	
27.	Course Outcome Assessment	21/09/2022	R. Sl	

R. Sl
STAFF IN-CHARGE

HOD

Form No: AC28

JCT

JCT College of Engineering and Technology

Coimbatore – 641 105

CLASS TIME TABLE

Department of Electronics and communication Engineering

(WITH EFFECT FROM 09.12.2019)

NBA ACCREDITED Engineering 4 Courses PCE | EEE MECH | CSE — NAAC 'A' Grade

Faculty Name: R.SRIKUMAR **Academic Year: 2021-22** **Semester: Even**

Period/Time	I	II	BREAK	III	IV	LUNCH BREAK	V	VI	VII	VIII
Day	9.10-10.00	10.00-10.45		11.00-11.45	11.45-12.30		01.20-02.05	02.05-02.50	02.50-03.35	03.35-04.20
Mon					PQT II-CSE					
Tue								PQT II-CSE		
Wed		PQT II-CSE								
Thu	PQT II-CSE				PQT II-CSE					
Fri									PQT II-CSE	
Sat										

S.No	Subject/Work Head	Theory	Tutorial	Practical In-charge	Practical Assisting	Seminar	T & P	Others	Total
1.	MA8402-PROBABILITY AND QUEUEING THEORY – II CSE	6							6

HOD

JCT College of Engineering and Technology

Pichanur,Coimbatore - 641 105 Ph : 0422-2636900

II B.E. Computer Science and Engineering - B 2021 - 2022

S.No	Register No	Student Name
1		YASHVINDRA KUMAR
2	720920104001	AJAY KUMAR SAHNI
3	720920104003	ALISHA KHANAM
4	720920104007	ANKIT KUMAR PADIT
5	720920104010	ARSHI KHANAM
6	720920104013	AZHARUDDIN ANSARI
7	720920104015	DEEPAK KUMAR
8	720920104016	DEVESH KUMAR
9	720920104020	KAMLESH KUMAR GUPTA
10	720920104025	KRISHNA KUMAR
11	720920104030	MD AJBULLAH MANSURI
12	720920104031	MD JUNED ALAM
13	720920104032	MD KHALID
14	720920104033	MD SAMAR ATIB
15	720920104034	MD SAQUIB ANSARI
16	720920104035	MD SARVAR
17	720920104036	MINHAJ AKRAM
18	720920104039	MD IFHAMULLAH
19	720920104041	MUSKAN KUMARI
20	720920104045	NIRAJ PANDIT
21	720920104046	NISHU KUMAR PANDEY
22	720920104047	NITESH KUMAR THAKUR
23	720920104050	PARDHUMAN KUMAR
24	720920104051	PARVEJ ANSARI
25	720920104053	PRATIK KUMAR JHA
26	720920104055	PRIYA KUMARI
27	720920104056	RAHUL KUMAR CHAUHAN
28	720920104057	RAHUL KUMAR SHARMA
29	720920104058	RAJA BABU

S.No	Register No	Student Name
30	720920104059	RAJNANDHAN KUMAR
31	720920104062	RANA PRATAP RAO
32	720920104064	RANJEET KUMAR THAKUR
33	720920104065	RANJIT KUMAR YADAV
34	720920104066	RAVI KUAMR
35	720920104067	RAVIRANJAN KUMAR
36	720920104068	RITESH KUMAR DUBEY
37	720920104069	ROHIT KUMAR
38	720920104070	ROHIT YADAV
39	720920104076	SUMIT KUMAR
40	720920104077	SUNIL KUMAR
41	720920104082	VIKRAM KUMAR
42	720920104084	VISHAL KUMAR CHAUHAN
43	720920104088	VIVEK KUMAR

MA8402 **PROBABILITY AND QUEUING THEORY** **L T P C**

4 0 0 4

OBJECTIVES:

- To provide necessary basic concepts in probability and random processes for applications such as random signals, linear systems in communication engineering.
- To understand the basic concepts of probability, one and two dimensional random variables and to introduce some standard distributions applicable to engineering which can describe real life phenomenon.
- To understand the basic concepts of random processes which are widely used in IT fields.
- To understand the concept of queueing models and apply in engineering.
- To understand the significance of advanced queueing models.
- To provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.

UNIT I PROBABILITY AND RANDOM VARIABLES 12

Probability – Axioms of probability – Conditional probability – Baye's theorem - Discrete and continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions.

UNIT II TWO - DIMENSIONAL RANDOM VARIABLES 12

Joint distributions – Marginal and conditional distributions – Covariance - Correlation and linear regression – Transformation of random variables – Central limit theorem (for independent and identically distributed random variables).

UNIT III RANDOM PROCESSES 12

Classification – Stationary process – Markov process - Poisson process - Discrete parameter Markov chain – Chapman Kolmogorov equations – Limiting distributions.

UNIT IV QUEUEING MODELS 12

Markovian queues – Birth and death processes – Single and multiple server queueing models Little's formula - Queues with finite waiting rooms – Queues with impatient customers : Balking and reneging.

UNIT V ADVANCED QUEUEING MODELS 12

Finite source models - M/G/1 queue – Pollaczek Khinchin formula - M/D/1 and M/E$_k$/1 as special cases – Series queues – Open Jackson networks.

TOTAL: 60 PERIODS

OUTCOMES:

Upon successful completion of the course, students should be able to:

- Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
- Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
- Apply the concept of random processes in engineering disciplines.• Acquire skills in analyzing queueing models.
- Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner.

TEXTBOOKS:

1. Gross, D., Shortle, J.F, Thompson, J.M and Harris. C.M., —Fundamentals of Queueing Theory", Wiley Student 4th Edition, 2014.

2. Ibe, O.C., —Fundamentals of Applied Probability and Random Processes", Elsevier, 1st Indian Reprint, 2007.

REFERENCES :

1. Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.

2. Taha, H.A., "Operations Research", 9th Edition, Pearson India Education Services, Delhi, 2016.

3. Trivedi, K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", 2nd Edition, John Wiley and Sons, 2002.

4. Yates, R.D and Goodman, D. J., "Probability and Stochastic Processes", 2nd Edition, Wiley India Pvt. Ltd., Bangalore, 2012.

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JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

PICHANUR, COIMBATORE - 641105

COURSE INFORMATION SHEET

DEPARTMENT : COMPUTER SCIENCE AND ENGINEERING	**PROGRAMME :** B.E (CSE)
COURSE: PROBABILITY AND QUEUING THEORY	**SEMESTER:** IV **CREDITS:** 4
COURSE CODE: MA8402 / C209 **REGULATION:** R2017	**COURSE TYPE:** ~~CORE /ELECTIVE / BREADTH/~~S&H
COURSE AREA / DOMAIN: SCIENCE	**CONTACT HOURS:** 5 hours/Week
CORRESPONDING LAB COURSE CODE(IF ANY): NIL	**LAB COURSE NAME (IF ANY):** NIL

SYLLABUS:

UNIT	DETAILS	HOURS
I	**RANDOM VARIABLES** Probability – Axioms of probability – Conditional probability – Baye's theorem - Discrete and continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions.	12
II	**TWO - DIMENSIONAL RANDOM VARIABLES** Joint distributions – Marginal and conditional distributions – Covariance – Correlation and Linear regression – Transformation of random variables – Central limit theorem.	12
III	**RANDOM PROCESSES** Classification – Stationary process – Markov process - Poisson process – Discrete parameter Markov chain – Chapman Kolmogorov equations – Limiting distributions.	12
IV	**QUEUEING MODELS** Markovian queues – Birth and Death processes – Single and multiple server queueing models –Little's formula - Queues with finite waiting rooms – Queues with impatient customers: Balking and reneging.	12
V	**ADVANCED QUEUEING MODELS** Finite source models - M/G/1 queue – Pollaczek Khinchin formula - M/D/1 and M/EK/1 as special cases – Series queues – Open Jackson networks.	12
	TOTAL HOURS	**60 Periods**

TEXT/REFERENCE BOOKS:

T / R	AUTHORS / BOOK TITLE / PUBLICATION
T	Ibe. O.C., "Fundamentals of Applied Probability and Random Processes", Elsevier, 1st Indian Reprint, 2007.
T	Gross. D. and Harris. C.M., "Fundamentals of Queueing Theory", Wiley Student edition, 2004.
R	Robertazzi, "Computer Networks and Systems: Queueing Theory and performance evaluation", Springer, 3rd Edition, 2006.
R	Taha. H.A., "Operations Research", Pearson Education, Asia, 8th Edition, 2007.
R	Trivedi.K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", John Wiley and Sons, 2nd Edition, 2002.
R	Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.
R	Yates. R.D. and Goodman. D. J., "Probability and Stochastic Processes", Wiley India Pvt. Ltd., Bangalore, 2nd Edition, 2012.

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
MA8351	DISCRETE MATHEMATICS	To understanding the concepts of logical, basic concepts of graph theory, application of algebraic structures, lattices and Boolean algebra, Basic terminologies used in computer science courses and applications of ideas to solve practical problems.	III
MA8251	MATHEMATICS – II	The subject helps the students to develop the fundamentals and basic concepts in Matrix, vector calculus, Laplace transform, analytic function and complex functions. Students will be able to solve problems related to engineering applications by using these techniques.	II
MA8151	MATHEMATICS – I	This course equips students to have basic knowledge and understanding in one fields of	I

		materials, integral and differential calculus.	

COURSE OBJECTIVES:

1	To provide necessary basic concepts in probability and random processes for applications such as random signals, linear systems in communication engineering.
2	To understand the basic concepts of probability, one and two dimensional random variables and to introduce some standard distributions applicable to engineering which can describe real life phenomenon.
3	To understand the basic concepts of random processes which are widely used in IT fields.
4	To understand the concept of queueing models and apply in engineering.
5	To understand the significance of advanced queueing models. To provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.

COURSE OUTCOMES:

S.NO.	Blooms' Taxonomy Level	DESCRIPTION	PO(1..12) MAPPING	PSO(1..2) MAPPING
C209.1	Understand (level 2) Analyze (level 4)	Have a well founded knowledge of standard distributions which can describe real life phenomena.	PO1,PO2	PSO1
C209.2	Understand (level 2) Analyze (level 4)	Acquire skills in handling situations involving more than one random variable and functions of random variables.	PO1,PO2	PSO1
C209.3	Knowledge (level 1) Analyze (level 4)	Understand and characterize phenomena which evolve with respect to time in a Probabilistic manner.	PO1,PO2	PSO1
C209.4	Knowledge (level 1) Apply (level 3)	Be exposed to basic characteristic features of a queuing system and acquire skills in analyzing queuing models.	PO1,PO2	PSO1
C209.5	Knowledge (level 1) Apply (level 3)	Acquire skills in analyzing queuing models.	PO1,PO2	PSO1
COURSE OVERALL PO /PSO MAPPING: 1,2/1				

COs VS POs/PSOs MAPPING JUSTIFICATION:

S.NO	PO /PSO MAPPED	LEVEL OF MAPPING	JUSTIFICATION
C209.1	PO1	2	Ability to solve the problems on continuous ,discrete random variables and distributions in engineering.
	PO2	2	Ability to have knowledge to analyze the distribution problems.
	PSO1	1	Able to solve random variable problems in competitive examination
C209.2	PO1	2	Able to gain knowledge about joint distribution, covariance and regression in engineering
	PO2	2	Understand to analyze the joint distribution, covariance problems.
	PSO1	1	Able to use Two dimensional random variable related problems in competitive examination
C209.3	PO1	2	Able to gain knowledge about random process in engineering.
	PO2	2	Understand to solve the random process problems
	PSO1	1	Have ability to solve problems related to random process in competitive exam.
C209.4	PO1	3	Understand how to use queueing theory model and its solutions to solve engineering problems.
	PO2	2	Ability to Analyze the queueing theory problems.
	PSO1	1	Have ability to solve problems related to queueing models in competitive exam
C209.5	PO1	3	Can understand to solve the series queues problems in engineering.
	PO2	2	Understand to analyze the problems on series queues
	PSO1	1	To gain knowledge to apply advanced queueing model problems in competitive exam

GAPES IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS, POs & PSOs:

S.NO.	DESCRIPTION	PROPOSED ACTIONS
1	Applications of random variables in computer science engineering	Assignment
2	Applications of two dimensional random variables in computer science engineering	Seminar
3	Applications of random process in computer science	Assignment

	engineering	
4	Applications of queuing models in computer science engineering	Seminar
5	Applications of advanced queuing models in computer science engineering	Assignment

PROPOSED ACTIONS: TOPICS BEYOND SYLLABUS/ASSIGNMENT/INDUSTRY VISIT/GUEST LECTURER/NPTEL ETC

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

1	Applications of random variables
2	Applications of two dimensional random variables
3	Applications of Random Process
4	Applications of Queueing Theory
5	Applications of advanced queuing models

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/112106131/30
2	https://www.youtube.com/watch?v=r1sLCDA-kNY
3	https://www.youtube.com/watch?v=xGkpXk-AnWU
4	https://www.youtube.com/watch?v=4B3pMYVUL0c&list=PL_hiZmDUXdGtpxUTRTw10v2yUQfpf-85N
5	https://www.cse.msu.edu/~cse808/note/lecture5.ppt

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

☑ CHALK & TALK	☑ STUD. ASSIGNMENT	☑ WEB RESOURCES	☐ NPTEL/OTHERS
☐ LCD/SMART BOARDS	☐ STUD. SEMINARS	☐ ADD-ON COURSES	☐ WEBNIARS

ASSESSMENT METHODOLOGIES-DIRECT

☑ ASSIGNMENTS	☐ STUD. SEMINARS	☑ TESTS/MODEL EXAMS	☑ UNIV. EXAMINATION
☐ STUD. LAB PRACTICES	☐ STUD. VIVA	☐ MINI/MAJOR PROJECTS	☐ CERTIFICATIONS
☐ ADD-ON COURSES	☐ OTHERS		

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ASSESSMENT METHODOLOGIES-INDIRECT

☐ ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE)	☐ STUDENT FEEDBACK ON FACULTY (TWICE)
☐ ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS	☐ OTHERS

INNOVATIONS IN TEACHING/LEARNING/EVALUATION PROCESSES:

1 Technical Quiz and nptel assignment questions will be discussed.

2. Will be showed NPTEL videos.

3. Will be identifying the slow learner students based on performance in test and conduct special Coaching class for weak students.

Prepared by
(Faculty)

Approved by
(HOD)

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LESSON PLAN

Academic Year 2021-22

Department : CSE
Branch and Year: BE-CSE & II Year
Subject Title : PROBABILITY AND QUEUING THEORY

Faculty Name : R.SRIKUMAR
Semester No : IV
Subject Code : MA8402

Lecture No.	Topic	Reference	Teaching Aids
	UNIT : I –PROBABILITY AND RANDOM VARIABLES		
1.	Probability -Axioms of Probability – Conditional Probability	T2,R1	CHALK & BOARD
2.	Baye's Theorem Problems	T2,R1	CHALK & BOARD
3.	Discrete and continuous Random Variable Problems	T2,R1	CHALK & BOARD
4.	Moments ,Moment Generating Function Problems	T2,R1	CHALK & BOARD
5.	Problems based on Baye,s Theorem, Discrete and continuous variables, MGF.	T2,R1	CHALK & BOARD
6.	Binomial Distribution – MGF, Mean & Variance Problems	T2,R1	CHALK & BOARD
7	Poisson Distribution - MGF, Mean & Variance Problems	T2,R1	CHALK & BOARD
8.	Geometric Distribution - MGF, Mean & Variance Problems	T2,R1	CHALK & BOARD
9.	Problems based on , Binomial, Poisson, Geometric Distributions	T2,R1	CHALK & BOARD
10	Uniform, Exponential Distribution - MGF, Mean Variance Problems	T2,R1	CHALK & BOARD
11	Normal Distribution - MGF, Mean & Variance Problems	T2,R1	CHALK & BOARD
12	Problems based Uniform, Exponential Normal Distributions.	T2,R1	CHALK & BOARD
13	**CBS 1:** Applications of random variables		CHALK & BOARD
	UNIT : II-TWO DIMENSIONAL RANDOM VARIABLES		
14	Joint Distributions Marginal distributions - Discrete case Problems	T2,R4	CHALK & BOARD
15	Joint Distributions Marginal distributions continuous case Problems	T2,R4	CHALK & BOARD
16.	Conditional distributions Discrete continuous case Problems	T2,R4	CHALK & BOARD

17.	Problems based on Marginal and Conditional distributions	T2,R4	CHALK & BOARD
18.	Covariance Problems	T2,R4	CHALK & BOARD
19.	Correlation Discrete data case problems	T2,R4	CHALK & BOARD
20.	Correlation Continuous distribution case problems	T2,R4	CHALK & BOARD
21.	:Problems based on Covariance and Correlation.	T2,R4	CHALK & BOARD
22.	Linear Regression Problems	T2,R4	CHALK & BOARD
23.	Transformation of Random Variables Problems	T2,R4	CHALK & BOARD
24.	Central Limit Theorem Problems	T2,R4	CHALK & BOARD
25.	:Problems based on Regression, Transformation Random Variables, Central Limit Theorem.	T2,R4	CHALK & BOARD
26.	**CBS 2:** Applications of two dimensional random variables	E2	CHALK & BOARD
	UNIT : III – RANDOM PROCESSES		
27.	Definition of Random processes and Classification of Random process	T2,R2,R4	CHALK & BOARD
28.	Stationary Process - Wide sense stationary Process Problems.	T2,R2,R4	CHALK & BOARD
29.	Strict sense stationary process Problems	T2,R2,R4	CHALK & BOARD
30.	Problems based Stationary Process.	T2,R2,R4	CHALK & BOARD
31.	Markov Process Problems on Markov chain	T2,R2,R4	CHALK & BOARD
32.	Transition Probability Matrix (tpm) Problems	T2,R2,R4	CHALK & BOARD
33.	Limiting distribution or long run Problems	T2,R2,R4	CHALK & BOARD
34.	Problems based Markov Process.	T2,R2,R4	CHALK & BOARD
35.	Problems on Poisson Process	T2,R2,R4	CHALK & BOARD
36.	Chapman Kolmogorov equations	T2,R2,R4	CHALK & BOARD
37.	Limiting distributions.	T2,R2,R4	CHALK & BOARD
38.	: Problems based Poisson Process and Limiting distributions.	T2,R2,R4	CHALK & BOARD
39.	**CBS 3:** Applications of Random Process	E3	CHALK & BOARD
	UNIT : IV – QUEUEING MODELS		
40.	Morovian Queues	T1, R3	CHALK & BOARD
41.	Birth and death process and Little formula	T1, R3	CHALK & BOARD
42.	single server queue with infinite capacity problems	T1, R3	CHALK & BOARD
43.	:Problems based Birth and death	T1, R3	CHALK & BOARD

	Process, single server queue with infinite Capacity.		
44.	Single server queue with finite capacity problems	T1, R3	CHALK & BOARD
45.	multi server queue with infinite capacity problems	T1, R3	CHALK & BOARD
46.	Multi server queue with finite capacity problems.	T1, R3	CHALK & BOARD
47.	Problems based on Single server queue with finite capacity , Multi server queue infinite and finite capacity.	T1, R3	CHALK & BOARD
48.	Queues with finite waiting rooms	T1, R3	CHALK & BOARD
49.	Queues with impatient customers problems	T1, R3	CHALK & BOARD
50.	Balking and reneging .problems	T1, R3	CHALK & BOARD
51.	**Tutorial 3:** Problems based on Queues with im customers, Balking and reneging.	T1, R3	CHALK & BOARD
52.	**CBS 4:** Applications of Queuing Theory	E4	CHALK & BOARD
	UNIT: V –ADVANCED QUEUEING MODELS		
53.	M/G/1 queue problems.	T1,R2	CHALK & BOARD
54.	P-K formula derivation.	T1,R2	CHALK & BOARD
55.	P-K formula problems	T1,R2	CHALK & BOARD
56.	Problems based on M/G/1 queue, P-K formula.	T1,R2	CHALK & BOARD
57.	M/D/1 and M/EK/1 special cases derivations.	T1,R2	CHALK & BOARD
58.	M/D/1 special cases problems	T1,R2	CHALK & BOARD
59.	M/EK/1 as special cases Problems	T1,R2	CHALK & BOARD
60.	Problems based on M/D/1 and M/EK/1 special cases Problems.	T1,R2	CHALK & BOARD
61.	Series queues problems	T1,R2	CHALK & BOARD
62.	Open Jackson networks derivations	T1,R2	CHALK & BOARD
63.	Open Jackson networks problems	T1,R2	CHALK & BOARD
64.	Problems based on Series queues, Open Jackson networks problems	T1,R2	CHALK & BOARD
65.	CBS 5: Applications of advanced queuing models	E5	CHALK & BOARD

TEXT BOOKS:

1. Gross, D., Shortle, J.F, Thompson, J.M and Harris, C.M., —Fundamentals of Queueing Theory", Wiley Student 4th Edition, 2014.
2. Ibe, O.C., —Fundamentals of Applied Probability and Random Processes", Elsevier 1st Indian Reprint, 2007

REFERENCES:

1. Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.
2. Taha, H.A., "Operations Research", 9th Edition, Pearson India Education Services, Delhi, 2016.
3. Trivedi, K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", 2nd Edition, John Wiley and Sons, 2002.
4. Yates, R.D. and Goodman. D. J., "Probability and Stochastic Processes", 2nd Edition, Wiley India Pvt. Ltd., Bangalore, 2012.

E-RESOURCES (NPTEL, URLs, e-Books, etc.):

1. https://nptel.ac.in/courses/112106131/30
2. https://www.youtube.com/watch?v=r1sLCDA-kNY
3. https://www.youtube.com/watch?v=xGkpXk-AnWU
4. https://www.youtube.com/watch?v=4B3pMYVUL0c&list=PL_hiZmDUXdGtpxUTRTw10v2yUQfpf-85N
5. https://www.cse.msu.edu/~cse808/note/lecture5.ppt

Date: 11.03.2022

Sign. Of Faculty:

Name: Mr.R.SRIKUMAR

Date: 11.03.22

Sign. Of HOD:

Name: Dr.M.MURALIDHARAN

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DEPARTMENT OF SCIENCE AND HUMANITIES (MATHEMATICS)

MA 8402 - PROBABILITY AND QUEUEING THEORY

QUESTION BANK FOR UNIT 1 to 5

PART B

UNIT I

1. The probability function of a r.v is given below, find k, P(X<6), P(0<X<5). If $P(X \leq k) > 1/2$, find the minimum value of k and determine the distribution function of x.

X	0	1	2	3	4	5	6	7
P(X)	0	k	2k	2k	3k	K^2	$2k^2$	$7k^2+k$

2. A random variable X has the following probability disreibution

   X ; 0 1 2 3 4 5 6 7 8

   P(x); a 3a 5a 7a 9a 11a 13a 15a 17a

   Find (i) a (ii) Find $P(X \prec 3), P(X \geq 3), P(0 \prec X \prec 3)$

   (iii) What is the smallest value of a for which $P(X \leq x) \succ 0.5$

   (iv) cdf

3. Find the MGF, mean and variance of Uniform distribution.
4. Find MGF, mean and variance of Binomial distribution.
5. Find the MGF of Geometric distribution and hence find mean and variance
6. State and prove the memory less property of Geometric distribution.
7. State and prove memory less property of exponential distribution.
8. A r.v has the p.d.f. $f(x) = kx^2e^{-x}$, $X > 0$. Find the r^{th} moment of X. Hence find the mean and variance.

9. Find the MGF of $f(x) = 2e^{-2x}$, $x>0$ and hence find mean and variance
10. A random variable X has the probability function $P(x) = \frac{1}{2^x}, x = 1,2,3,$ ...Find the MGF, mean and variance. Find also P(X is even), $P(X \geq 5)$, P (X is divisible by 3).
11. Six dice are thrown 729 times. How many times do you expect at least 3 dice to show a 5 or 6?
12. If is known that the probability of an item produced by a certain machine will be defective is 5%. If the produced items are sent to the market in packets of 20. Find the number of packets containing. (i) At least 2 defective items. (ii) At most 2 defective items in a consignment of 1000 packets using Poisson distribution.

13. A die is cast until 6 appear. What is the probability that it must be cast more than 5 times?

14. A random variable X has a uniform distribution over the interval (-3,3).
Find P[X = 2] b. P[X < 2] c. P[|X| < 2] d. P[|X – 2| < 2]

15. The weekly wages of 1000 workmen are normally distributed around a mean of Rs 70 with a S.D. of Rs 5. Estimate the number of workers whose weekly wages will be
(i) between Rs 69 and Rs 72 (ii) Less than Rs 69 (iii) More than Rs 72.

UNIT II

16. The joint density function of X and Y is
$f(x,y) = \begin{cases} e^{-(x+y)}, 0 \le x, y \le \infty \\ 0, otherwise \end{cases}$. Are X and Y independent.
Find (i) P(X<1) ,(ii) P(X+Y<1).

17. The joint probability function (X,Y) is given by
P(X,Y) = k(3x+2y) x = 0,1,2 and y = 1,2,3
(i) Find the probability distribution
(ii) Find all conditional probability distribution

18. A The two dimensional random variable (x,y) has joint
probability mass function $f(x,y) = \frac{x+2y}{27}$ $x = 0,1,2, y = 0,1,2$ Find
(i) the conditional distribution of Y given X
(ii) the conditional distribution of X given Y.

19. The joint probability density function of the two dimensional random variable (X,Y) is $f(x,y) = \begin{cases} 2-x-y, & 0 \le x \le 1, \ 0 \le y \le 1 \\ 0, & otherwise \end{cases}$. Find Var(x), Var(Y) and also the covariance between X and Y. Also find ρ_{xy}.

20. If X and Y are independent random varaibles each normally distributed with mean zero and variance σ^2, find the density function of $R = \sqrt{X^2 + Y^2}$ and $\theta = tan^{-1}(\frac{Y}{X})$.

21. Check whether X and Y are independent. (ii)Two random variable X and Y are related as $Y = 4X + 9$. Find the correlation coefficient between X and Y.

22. Find the two lines of regression for the following data.

X	150	152	155	157	160	161	164	166
Y	154	156	158	159	160	162	161	164

23. A random sample of size 100 is taken from a population whose mean is 60 and variance is 400. Using CLT, with what probability can we assert that the mean of the sample will not differ from $\mu = 60$ by more than 4.

24. Let $X_1, X_2, X_3, \ldots X_{75}$ be poison variates with mean is 2 . Find
$P(120 \le S_{75} \le 160)$

UNIT III

25. The process $\{X(t)\}$ whose probability distribution under certain Condition is given by $P[X(t)=n]=\begin{cases}\frac{(at)^{n-1}}{(1+at)^{n+1}}, & n=1,2,3,\ldots.\\ \frac{at}{1+at}, & n=0\end{cases}$ Show that it is not stationary.
26. Show that the random process X(t) = A cos (wt + θ) is wide sense stationary if A and w are constant and θ is uniformly distributed random variable in $(0, 2\pi)$.
27. Show that process $x(t)=A\cos(\omega t+\theta)$ where A , ω are constants and θ is uniformly distributed in $((-\pi,\pi)$ is WSS process.
28. Let the two random process X(t) and Y(t) be defined as X(t) = A cos wt +B sin wt, Y(t) =B cos wt – A sin wt where A and B are random variables and w is a constant. If A and B are uncorrelated random variable with zero mean and equal variance prove that X(t) and Y(t) are jointly WSS.
29. Three girls throwing a ball to each other. G1 always through the ball G2. G2 always through the ball G3. But G3 is just like through the ball G2 as G1. Prove that the process is Markov. Find the transition matrix and classify the states.
30. A man goes to his office by car (or) train every day. He never goes 2 days is go by train but if he drive one day then the next day he just like to go by car again as he is to travel by train. Now suppose that on the first day of the week, the man tossed a fair dice and went by a car to work if and only if a "6" appeared. Find (i) the probability that he went by train on the third day and. (ii) the probability that he went by car to work in a long run.

31. The transition probability matrix of a Markov chain $\{X_n\}$, three states 1,2 and 3 is $P=\begin{bmatrix}0.2 & 0.3 & 0.5\\ 0.1 & 0.6 & 0.3\\ 0.4 & 0.3 & 0.3\end{bmatrix}$ and the distribution is $P^{(0)}$ = (0.5,0.3,0.2). Find
    (i) $P\{X_2=2\}$
    (ii) $P\{X_3=3, X_2=2, X_1=1, X_0=3\}$.
32. Prove that the difference of two independent Poisson Processes is not a Poisson Process.
33. The sum of two independent Poisson processes is a Poisson process.

UNIT IV

34. Customer arrive at a one man barbershop according to a Poisson processes with mean inter arrival time of 12 minutes. customer spends an average of 10 minutes in the barber's chair. a) Find the expected no of customers in the barber shop and in the queue. b) How much time can a customer expected to spend in the barbershop? c) What are the average time customers spend in the queue? d) What is the probability that more than 3 customers are in the system?
35. Automatic car wash facility operates with only one bay. Cars arrive according to a Poisson distribution with a mean of 4 cars per hour and may wait in the facility's parking

lot if the bay is busy. The parking lot is large enough to accommodate any number of cars. If the service time for all cars is constant and equal to 10 minutes, determine L_s, L_q, W_s, W_q

36. A super market has a single cashier. During the peak hours, customers arrive at a rate of 20 customers per hour. The average number of customers that can be processed by the cashier is 24 per hour. Find (i) the average number of customer in the queue (ii) the average number of customers in the system (iii) the average time a customer spends in the system and in the queue.
37. There are 3 typists in an office. Each typist can type an average of 6 letters per hour. If letters arrive for being typed at the rate of 15 letters per hour,
    (i) What fraction of the time all the typists will be busy?
    (ii) What is the average number of letters waiting to be typed?
    (iii) What is the average time a letter has to spend for waiting and for being typed?
    (iv) What is the probability that a letter will take longer than 20 min. waiting to be typed and being typed?

38. A tax consulting firm has three counters in its office to receive people who have problems concerning their income and sales taxes. On the arrival 48 persons arrive in an 8 hours day. Each tax advisor spend 15 minutes on the average on an arrival. If the arrivals are Poisson distributed and service times are exponentially distributed. Find
    (a) Average no of customer in the system.
    (b) Average no of customer waiting to be served.
    (c) Average time customers spend in the system.
    (d) Average waiting time for a customer.
    (e) Probability that a customer has to wait before he gets service.
39 Consider a single server queueing system with Poisson input, exponential service times. Suppose the mean arrival rate is 3 calling units per hour, the expected service time is 0.25 hours and the maximum permissible number calling units in the system is two. Find the steady state probability distribution of the number of calling units in the system and the expected number of calling units in the system.

40. Patient arrives at a clinic having single doctor according to a Poisson distribution at a rate of 30 patients per hour. The waiting room does not accommodate more than 14 patients. Examination time per patient is exponentially with mean rate of 20 per hour.
    (a) Find the effective arrival rate at the clinic.
    (b) What is the Probability that an arriving patient will not wait?
    (c) What is the expected waiting time until a patient is discharged from the clinic?
41. Customers arrive at a one window drive-in bank according to Poisson distribution with mean 10 per hour. Service time per customer is exponential with mean 5 minutes. The space is front of window, including that for the serviced car can accommodate a maximum of three cars. Others cars can wait outside this space.
    (1) What is the probability that an arriving customer can drive directly to the space in front of the window?
    (2) What is the probability that an arriving customer will have to wait outside the indicated space?

(3) How long is an arriving customer expected to wait before being served?

42. At a port there are 6 unloading berths and 4 unloading crews. When all the berths are full arriving ships are diverted to an overflow facility 20 kms down the river. Tankers arrive according to Poisson process with a mean of 1 every 2 hrs. It takes for an unloading crew on the average, 10 hrs to unload a tanker, the unloading time following an exponential distribution. Find (i) how many tankers are at the port on the average?

(ii) How long does a tanker spend at the port on the average?

(iii) What is the average arrival rate at the overflow facility?

UNIT V

43. Derive Pollaczek – Khintchine formula of M/G/1 queue.

44. A car wash facility operates with only one bay. Cars arrive according to a Poisson distribution with a mean of 4 cars per hour and may wait in the facility's parking lot if the bay is busy. The parking lot is large enough to accommodate any number of cars. If the service time for a car has uniform distribution between 8 and 12 minutes, Find

(1) The average number of cars waiting in the parking lot

(2) The average waiting time of a car in the parking lot.

45. A one man barber shop takes exactly 25 minutes to complete one hair-cut. If customers arrive at the barber shop in a Poisson fashion at an average rate of one every 40 minutes, how long on the average a customer spends in the shop? Also find the average time a customer must wait for service.

46. A car manufacturing plant uses one big crane for loading cars in a truck. Cars arrive for loading by the crane according to a Poisson distribution with mean of 5 cars per hour. Given that the service time for all cars is constant and equal to 6 minutes, determine Ls, Lq, Ws, Wq.

47. Automatic car wash facility operates with only one bay. Cars arrive according to a Poisson distribution with a mean of 4 cars per hour and may wait in the facility's parking lot if the bay is busy. The parking lot is large enough to accommodate any number of cars. If the service time for all cars is constant and equal to 10 minutes, determine

(1) Mean number of customers in the system L_s

(2) Mean number of customers in the queue L_q

(3) Mean waiting time of a customer in the system W_s

(4) Mean waiting time of a customer in the queue W_q.37. Write short notes on the following:

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PICHANUR, COIMBATORE – 641105

ACCREDITED BY NBA ACCREDITED Engineering 4 Courses PCE | EEE MECH | CSE NAAC 'A' Grade

Exam Date	:	19.04.2022	**Session**	:	FN
Examination	:	CIA I	**Department**	:	COMPUTER SCIENCE
Course Code	:	MA8402	**Course Title**	:	PROBABILITY& QUEUEING THEORY
Year / Sem	:	II / IV	**Maximum marks**	:	50 MARKS
Academic year	:	2021-2022 (EVEN)	**Duration**	:	1.30 HOURS

CO No.	Blooms Level*	Q.No.	PART-A (Answer all Questions) 5 x 2 = 10 Marks	
C01	E	1.	If A and B are events with $P(A)=\frac{3}{8}, P(B)=\frac{1}{2}$ and $P(A\cap B)=\frac{1}{4}$, find $P(A^C \cap B^C)$	2
C01	E	2.	A continuous random variable X has p.d.f $f(x)=\frac{k}{1+x^2}$, $-\infty < x < \infty$. find the value of k.	2
C01	E	3.	If a RV x has the moment generating function $M_X(t)=\frac{2}{2-t}$, determine the variance of X	2
C01	AP	4.	If the probability that a target is destroyed on any one shot is 0.5, what is the probability that it would be destroyed on 6th attempt?	2
C01	E	5.	If X is uniformly distributed with mean 1 and variance 4/3, find P (X < 0).	2
			PART-B (Answer any 3 Questions) 3 x 10 = 30 Marks	
C01	AP	6	In a bolt factory machines A, B, C manufacture respectively 25 %, 35 % and 40 % of the total of their output 5 %, 4 % & 2 % are defective bolts. A bolt is drawn at random from the product and is found to be defective What are the probabilities that it was manufactured by machine A, B & C.	10
C01	E	7	Find the Moment generating function, mean and variance of geometric distribution	10

<table>
<tr><td>C01</td><td>E</td><td>8</td><td>Find the value of K and calculate mean and variance for the random variable X with the following probability distribution
<table>
<tr><td>X</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>P(X)</td><td>0.1</td><td>K</td><td>0.2</td><td>2k</td><td>0.3</td><td>k</td></tr>
</table></td><td>10</td></tr>
<tr><td>C01</td><td>E</td><td>9</td><td>The p.d.f of a continuous random variable X is given as
$f(x)=\begin{cases}\frac{1}{6}, -3 \le x \le 3 \\ 0, otherwise\end{cases}$ Find (i) P (-2 < X < 0) , (ii) Cumulative distribution function , F (x) and (iii) E (X) and Var (X).</td><td>10</td></tr>
<tr><td colspan="5">PART-C (Answer any one Question) 1 x 10 = 10 Marks</td></tr>
<tr><td>C01</td><td>AP</td><td>10</td><td>A machine manufacturing bolts is known to produce 5 % defective In a random sample of 15 bolts. What is the probability that are (i)Exactly 3 defective bolts and (ii) not more than5 defective bolts.</td><td>10</td></tr>
<tr><td>C01</td><td>E</td><td>11</td><td>A random variable X has a uniform distribution over the interval (-3, 3) . compute
(i) $P(X<2), P(|X|<2), P(|X-2|<2)$,
(ii) Find K for which $P(X>K)=\frac{1}{3}$.</td><td></td></tr>
</table>

*** Bloom's Level:** R-Remembering U-Understanding AP-Applying AZ-AnalyzingE-Evaluating C-Creating

Faculty Incharge

HoD

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ACCREDITED BY NBA Accredited Engineering & Courses PCT I EEE MECH I CSE | NAAC 'A' Grade

CONTINUOUS INTERNAL ASSESSMENT

Program	: UG / PG	Register Number	:	720920104013	
Branch	: CSE	Name of the Student	:	AZHARUDDIN ANSARI	
Internal Exam	: I / II / III / MODEL	Subject code / Name	:	MA8402	
Date & Session	: 19-04-22 & FN	Signature of Invigilator	:	19/4/22	

Course Outcome	Part - A											Grand Total Marks
	1	2	3	4	5	6	7	8	9	10	Total	
CO1	2	2	2	2	2						10	10
CO2												
CO3												
CO4												
CO5												

Course Outcome	Part - B											Grand Total Marks
	11		12		13		14		15		Total	
	a	b	a	b	a	b	a	b	a	b		
CO1	10		[redacted]		10		10				30	30
CO2												
CO3												
CO4												
CO5												

Part - C				Grand Total Marks
Course Outcome	16		Total	
	a	b		
CO		9	9	9
CO				

R.SRIKUMAR

Name and Signature of the Faculty

GRAND TOTAL (PART-A+B+C) 49

V.Gore

Course Outcome(CO) –Cumulative Score						Grand Total Marks
SECTION	CO1	CO2	CO3	CO4	CO5	
Part-A	10					49
Part-B	30					
Part-C	9					
Total	49					

Signature of the Student

PART - A

1.) Ans

Given: $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ & $P(A \cap B) = \frac{1}{4}$

Solution

$\therefore P(A^c \cap B^c) = P(A^c \cap B^c)$

$= P(A \cup B)^c$ [By Demorgan's]

$P(A^c \cap B^c) = 1 - P(A \cup B)$ ——— (1)

Here

W.K.T

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= \frac{3}{8} + \frac{1}{2} - \frac{1}{4}$

$= \frac{3+4-2}{8}$

$= \frac{7-2}{8}$

$P(A \cup B) = \frac{5}{8}$

put the value of $P(A \cup B)$ in equation (1)

$P(A^c \cap B^c) = 1 - P(A \cup B)$

$= 1 - \frac{5}{8}$

$= \frac{8-5}{8}$

$P(A^c \cap B^c) = \frac{3}{8}$

Ans

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NAAC 'A'

CONTINUOUS INTERNAL ASSESSMENT

Program	: UG / PG	Register Number	: 720920104013
Branch	: CSE	Name of the Student	: AZHARUDDIN ANSARI
Internal Exam	: I / II / III / MODEL	Subject code / Name	: MA8402
Date & Session	: 19-04-22 & FN	Signature of Invigilator	: 19/4/22

Course Outcome	Part - A											Grand Total Marks
	1	2	3	4	5	6	7	8	9	10	Total	
CO1	2	2	2	2	2						10	10
CO2												
CO3												
CO4												
CO5												

Course Outcome	Part - B											Grand Total Marks
	11		12		13		14		15		Total	
	a	b	a	b	a	b	a	b	a	b		
CO1	10		[redacted]		10		10				30	30
CO2												
CO3												
CO4												
CO5												

Part - C				Grand Total Marks
Course Outcome	16		Total	
	a	b		
CO		9	9	9
CO				

R. SRIKUMAR

R. S

Name and Signature of the Faculty

GRAND TOTAL (PART-A+B+C) 49

V. Jose

Course Outcome(CO) –Cumulative Score

SECTION	CO1	CO2	CO3	CO4	CO5	Grand Total Marks
Part-A	10					
Part-B	30					
Part-C	9					49
Total	49					

Azharudd. Ans

Signature of the Student

PART - A

1.) Ans

Given: $P(A) = \frac{3}{8}$, $P(B) = \frac{1}{2}$ & $P(A \cap B) = \frac{1}{4}$

Solution

$\therefore P(A^c \cap B^c) = P(A^c \cap B^c)$

$= P(A \cup B)^c$ [By Demorgan's]

$P(A^c \cap B^c) = 1 - P(A \cup B)$ — ①

Here

W.K.T

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= \frac{3}{8} + \frac{1}{2} - \frac{1}{4}$

$= \frac{3+4-2}{8}$

$= \frac{7-2}{8}$

$P(A \cup B) = \frac{5}{8}$

Sub the value of $P(A \cup B)$ in equation (1)

$P(A^c \cap B^c) = 1 - P(A \cup B)$

$= 1 - \frac{5}{8}$

$= \frac{8-5}{8}$

$P(A^c \cap B^c) = \frac{3}{8}$

Ans

2.) Ans

Given $f(x) = \frac{K}{1+x^2}$, $-\infty < x < \infty$

find the value of K

Solution:

We know that

$$\int_{-\infty}^{\infty} f(x)\,dx = 1$$

$$\Rightarrow \int_{-\infty}^{\infty} \frac{K}{1+x^2}\,dx = 1$$

$$\Rightarrow K \int_{-\infty}^{\infty} \frac{1}{1+x^2}\,dx = 1$$

$$\Rightarrow K \left[\tan^{-1}x\right]_{-\infty}^{\infty} = 1 \quad \left[\because \frac{d \tan^{-1}x}{dx} = \frac{1}{1+x^2}\right]$$

$$\Rightarrow K\left[\tan^{-1}\infty - \tan^{-1}\infty\right] = 1$$

$$\Rightarrow K\left[\frac{\pi}{2} - \left(-\frac{\pi}{2}\right)\right] = 1$$

$$\Rightarrow K\left\{\frac{\pi}{2} + \frac{\pi}{2}\right\} = 1$$

$$\Rightarrow K\pi = 1$$

$$\Rightarrow K = \frac{1}{\pi}$$ Ans

3) [illegible]

$M_x(t) = \frac{2}{[illegible]}$

$= \frac{2}{2\left(1 - \frac{t}{2}\right)}$

$= \left(1 - \frac{t}{2}\right)^{-1}$

$= 1 + \frac{t}{2} + \left(\frac{t}{2}\right)^2 + \left(\frac{t}{2}\right)^3 + \cdots$

$= 1 + [illegible] \cdot \frac{t}{1!} + [illegible] \cdot \frac{t^2}{2!} + [illegible] \cdot \frac{t^3}{3!} + \cdots$

$E(x) =$ Coefficient of $\frac{t}{1!} = [illegible]$

$E(x^2) =$ Coefficient of $\frac{t^2}{2!} = [illegible]$

$\text{Var } x = E(x^2) - [E(x)]^2$

$= [illegible] - [illegible]$

$= [illegible] - [illegible]$

$= [illegible]$

$\text{Var } x = [illegible]$

4.) Ans

Let x be a random variable of will destroyed on selected attempt.

$p = 0.5$, $q = 1 - p$

$= 1 - 0.5$

$= 0.5$

W.K.T.

Geometry distribution

$P[x = b] = q^{x-1} \cdot p$

$= (0.5)^{b-1} \cdot 0.5$

$= (0.5)^5 \cdot 0.5$

$= (0.5)^6$

$P[x = b] = 0.0156$ Ans

5.) Ans

According to uniformly distributed

$\text{Mean} = \frac{(a+b)}{2} = 1$

$\Rightarrow a + b = 2$ — (1)

$\text{Var}(x) = \frac{(b-a)^2}{12} = 4/3$

$\Rightarrow (b-a)^2 = \frac{4 \times 12}{3} = 16$

$\Rightarrow (b-a) = \pm 4$

$\Rightarrow b - a = 4$ — (11)

Eqn (i) + (ii) $\Rightarrow$ $a+b = 2$

$-a+b = 4$

$2b = 6$

$b = 3$

Put the value of b in eqn (i)

$a+b = 2$

$a+3 = 2$

$a = 2-3 = -1$

$a = -1$, $b = 3$

$$f(x) = \frac{1}{b-a}, \quad a < x < b$$

$$= \frac{1}{3+1}, \quad -1 < x < 3$$

$$f(x) = \frac{1}{4}$$

$$\therefore P(x < 0) = \int_{-1}^{0} \frac{1}{4}\, dx$$

$$= \frac{1}{4}\int_{-1}^{0} dx$$

$$= \frac{1}{4}\cdot [x]_{-1}^{0}$$

$$= \frac{1}{4}\times 1 = \frac{1}{4}$$

$$\therefore P(x < 0) = \frac{1}{4}$$

PART-C

11) Ans

Given interval $(-3, 3)$

Let $a = -3$, $b = 3$

We know that

fun of Uniform distribution is

$$f(x) = \frac{1}{b-a} \quad a < x < b$$

$$= \frac{1}{3-(-3)} \quad -3 < x < 3$$

$$= \frac{1}{3+3} \quad -3 < x < 3$$

$$f(x) = \frac{1}{6}$$

(i) $$P(x < 2) = \int_{-3}^{2} \frac{1}{6}\, dx$$

$$= \frac{1}{6} \int_{-3}^{2} dx$$

$$= \frac{1}{6} [x]_{-3}^{2}$$

$$= \frac{1}{6} [2+3]$$

$$P(x < 2) = \frac{5}{6} \quad \text{Ans}$$

$$P(|x| < 2) = P(-2 < x < 2)$$

$$= \int_{-2}^{2} \frac{1}{6}\, dx$$

$$P(|x|<2) = \frac{1}{6}\int_{-2}^{2} 1\,dx$$

$$= \frac{1}{6}[x]_{-2}^{2}$$

$$= \frac{1}{6}[2+2]$$

$$= \frac{4}{6} = \frac{2}{3} \quad \text{Ans}$$

& $P(|X-2|<2) = P(-2<X-2<2)$

$$= P(-2+2<X-2+2<2+2)$$

$$= P(0<X<4)$$

$$= \int_{0}^{4} \frac{1}{6}\,dx$$

$$= \frac{1}{6}\int_{0}^{4} dx$$

$$= \frac{1}{6}[x]_{0}^{4}$$

$$= \frac{1}{6} \times 4$$

$$= \frac{4}{6}$$

$$P(|x-2|<2) = \frac{2}{3}$$

11.) ii) Ans

$P(X > K) = \frac{1}{3}$, Here $f(x) = \frac{1}{6}$, $-3 < x < 3$

$$\Rightarrow \int_K^3 \frac{1}{6}\,dx = \frac{1}{3}$$

$$\Rightarrow \frac{1}{6}\int_K^3 dx = \frac{1}{3}$$

$$\Rightarrow \frac{1}{6}\left[x\right]_K^3 = \frac{1}{3}$$

$$\Rightarrow \left[x\right]_K^3 = 2$$

$$\Rightarrow (3-K) = 2$$

$$\Rightarrow 3-2=K$$

$$\Rightarrow K = 1$$ Ans

PART-B

8) Ans given data

X	-2	-1	0	1	2	3
P(x)	0.1	K	0.2	2K	0.3	K

We know that

$$\sum_{i=0}^{\infty} P(x_i) = 1$$

$\Rightarrow 0.1 + k + 0.2 + 2k + 0.3 + k = 1$

$\Rightarrow 0.6 + 4k = 1$

$\Rightarrow 4k = 1 - 0.6$

$\Rightarrow 4k = 0.4$

$\Rightarrow k = \frac{0.4}{4}$

$\therefore k = 0.1$

x	-2	-1	0	1	2	3
p(x)	0.1	0.1	0.2	0.2	0.3	0.1

$$\text{Mean} = E(x) = \sum_{i=-2}^{3} (x_i) \cdot p(x_i)$$

$$= -2 \cdot (0.1) + (-1)(0.1) + 0 \cdot (0.2) + 1 \cdot (0.2) + 2 \cdot (0.3) + 3 \cdot (0.1)$$

$$= -0.2 - 0.1 + 0 + 0.2 + 0.6 + 0.3$$

$$= -0.3 + 1.1$$

$$= 1.1 - 0.3$$

$$\text{Mean} = E(x) = 0.8 \quad \text{Ans}$$

$$E(x^2) = \sum_{i=-2}^{3} (x_i^2) \cdot p(x_i)$$

$$= 4 \cdot (0.1) + 1 \cdot (0.1) + 0 \cdot (0.2) + 1 \cdot (0.2) + 4 \cdot (0.3) + 9 \cdot (0.1)$$

$E(x^2) = 0.4 + 0.1 + 1 + 0.2 + 1.2 + 0.1$

$E(x^2) = 2.8$

$\text{Var}(x) = E(x^2) - [E(x)]^2$

$= 2.8 - (0.8)^2$

$= 2.8 - 0.64$

$\text{Var}(x) = \frac{2.16}{10}$

9.) Ans

$f(x) = \frac{1}{6} \quad -3 \le x \le 3$

(i) $p(-2 < x < 0)$

$= \int_{-2}^{0} \frac{1}{6}\, dx$

$= \frac{1}{6} \int_{-2}^{0} dx$

$= \frac{1}{6} [x]_{-2}^{0}$

$= \frac{1}{6} [0 + 2]$

$= \frac{2}{6}$

$= \frac{1}{3}$

(i.) if $x \leq 0$

$$f(x) = 0$$

when $-3 \leq x \leq 3$

$$f(x) = \int_{-3}^{x} \frac{1}{6}\, dx$$

$$= \frac{1}{6} \int_{-3}^{x} dx$$

$$= \frac{1}{6} [x]_{-3}^{x}$$

$$= \frac{1}{6} [x+3]$$

$$= \frac{x+3}{6}$$

$$\therefore F(x) = \begin{cases} 0, & \text{if } x \leq 0 \\ \frac{x+3}{6}, & -3 \leq x \leq 3 \\ 1, & x \geq 3 \end{cases}$$

Ans

(iii.) $f(x) = \frac{1}{6}, \quad -3 \le x \le 3$

$$E(x) = \int_{-3}^{3} x \cdot \frac{1}{6}\, dx$$

$$= \frac{1}{6} \int_{-3}^{3} x\, dx$$

$$= \frac{1}{6} \left[\frac{x^2}{2}\right]_{-3}^{3}$$

$$= \frac{1}{6} \left[\frac{9}{2} - \frac{9}{2}\right]$$

$$= \frac{1}{6} \times 0$$

$$E(x) = 0$$

$$E(x^2) = \int_{-3}^{3} x^2 \cdot \frac{1}{6}\, dx$$

$$= \frac{1}{6} \int_{-3}^{3} x^2\, dx$$

$$= \frac{1}{6} \left[\frac{x^3}{3}\right]_{-3}^{3}$$

$$= \frac{1}{6} \left[\frac{27}{3} + \frac{27}{3}\right]$$

$$= \frac{1}{6} \times 18 \times 3 = 3$$

$$E(x^2) = 3$$

$\therefore Var(x) = E(x^2) - (E$

$= 3 - 0$

$Var(x) = 3$

PART-B

6.) Ans

Let A_1, A_2, A_3 are manufacturing machines

$\therefore P(A_1) = 25\% = 0.25$, $P(A_2) = 35\% = 0.35$, $P(A_3) = 40\% = 0.4$

Let B be the defective bolts

$\therefore P(B/A_1) = 5\% = 0.05$, $P(B/A_2) = 4\% = 0.04$, $P(B/A_3) = 2\% = 0.02$

We know that

Total Probability theorem

$$\sum_{i=0}^{n} P(A_i) \cdot P(B/A_i)$$

$$= 0.25 \times (0.05) + 0.35 \times (0.04) + 0.4 \times (0.02)$$

$$= 0.0125 + 0.014 + 0.008$$

$$= 0.0345$$

$\therefore P[\text{defective bolts manufactured by machine } A_1]$

$$= P(A_1/B) = \frac{P(A_1) \cdot P(B/A_1)}{\sum_{i=1}^{3} P(A_i) \cdot P(B/A_i)}$$ [Algn to Bayes theorem]

$$= \frac{0.25 \times 0.05}{0.0345} = \frac{0.0125}{0.0345} = \cdots$$

$P(A_1/B) = 0.3623$

$P[\text{Defective bolts manufactured by } A_1] = P[A_1/B]$

$$P(A_1/B) = \frac{P(A_1) \cdot P(B/A_1)}{\sum_{i=1}^{3} P(A_i) \cdot P(B/A_i)}$$

$$= \frac{0.35 \times 0.04}{0.0345}$$

$$= \frac{0.014}{0.0345}$$

$$P(A_2/B) = 0.40579$$

Similarly

$$P(A_3/B) = \frac{P(A_3) \cdot P(B/A_3)}{\sum_{i=1}^{3} P(A_i) \cdot P(B/A_i)}$$

$$= \frac{0.4 \times 0.02}{0.0345}$$

$$= \frac{0.008}{0.0345}$$

$$P(A_3/B) = 0.2319$$

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MA8402--PROBABILITY&QUEUEING THEORY

ASSIGNMENT QUESTIONS

UNIT-I

PROBABILITY AND RANDOM VARIABLES

1. A bag contains 3 black and 4 white balls. Two ball's are drawn at random one at a time without replacement. What is (i) the probability that the second ball drawn is white? (ii) the conditional probability that the first ball drawn is white if the second ball is known to be white?

2. A random variable X has the following probability distribution

x	-2	-1	0	1	2	3
P(x)	0.1	k	0.2	2k	0.3	3k

Find k , $P(X<2)$, $P(-2<X<2)$, Find the CDF and Mean value of X

3. The p.d.f. of continuous R.V. X given by $f(x) = \begin{cases} \frac{1}{2} e^{\frac{-x}{2}}, & x>0 \\ 0, & x \le 0 \end{cases}$.

Deduce (i) C.D.F of X . F (x) (ii) P (X > 1) (iii) P (1 < X < 2) (iv) E (X^2)

4. An electrical firm manufacturing light bulbs that have a life, before burn –out that is normally distributed with mean equal to 800 hours and a standard deviation of 40 hours .Evaluate (i) the probability that a bulb buns more than 834 hours. (ii) the probability that bulbs burns between 778 and 834 hours.

5. If the density function of a continuous random variable X is given by $f(x) = \begin{cases} ax; 0 \le x \le 1 \\ a; 1 \le x \le 2 \\ 3a - ax; 2 \le x \le 3 \\ 0; \textit{Otherwise} \end{cases}$

find a; find CDF, $P(x \ge 1.5)$

UNIT – II

TWO - DIMENSIONAL RANDOM VARIABLES

1. From the following data find (i) $P(X \le 1)$ (ii) $P(Y \le 3)$ (iii) $P(X \le 1, Y \le 3)$ (iv) $P(X \le 1 / Y \le 3)$ (v) $P(Y \le 3 / X \le 1)$ (vi) $P(X+Y \le 4)$

   (vii) Find Marginal distribution of X (viii) find Marginal distribution of Y

   (ix) Find the conditional distribution of X given Y=2 and check X and Y are independent.

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PEELAMEDU, COIMBATORE.

Department of Science and humanities

Assignment Marks

Probability and Queueing Theory (MA8451)

YEAR/SEM: II/ IV **Branch: CSE** **Academic year: 2021-2022**

S.No	Register Number	Name of the Student	Marks (50)
1	720920104001	AJAY KUMAR SAHNI	38
2	720920104003	ALISHA KHANAM	48
3	720920104007	ANKIT KUMAR PADIT	42
4	720920104010	ARSHI KHANAM	45
5	720920104011	ARUN RAM K	42
6	720920104012	ASHICK S	38
7	720920104013	AZHARUDDIN ANSARI	48
8	720920104014	CHAGALETI CHANDRA SEKHAR REDDY	36
9	720920104015	DEEPAK KUMAR	42
10	720920104020	KAMLESH KUMAR GUPTA	40
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Staff In charge

HoD

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PICHANUR, COIMBATORE.641105

MA8402–PROBABILITY AND QUEUEING THEORY

TUTORIAL QUESTIONS

UNIT-I

PROBABILITY AND RANDOM VARIABLES

PART-A

1. If A and B are independent events with $P(A) = \frac{1}{2}$ and $P(B) = \frac{1}{3}$, find $P(\overline{A} \cap \overline{B})$

2. If A and B are two independent events then show that are $\overline{A}$ and $\overline{B}$ also independent.

3. Define binomial distribution. What are its mean and variance?

4. Find the moment generating function of a geometric distribution and hence find the mean.

5. Show that the mgf of the uniform distribution $f(x)=\frac{1}{2a}$ in (-a,a) is $\frac{\sinh at}{at}$

PART-B

6. In a shooting test, the probability of hitting the target is 1 / 2 for a, 2/3 for B, 3/4 for C. If all of them fire at the target. Find the probability that (i) none of them hits the target (ii)At least one of them hits the target, (iii) exactly one of them hits the target.

7..Three urns A_1,A_2,A_3 contain 3 red,4 white,1 blue; 1 red,2 white,3 blue;4 red, 3 white, 2 blue balls respectively. One urn is chosen at random and a ball is withdrawn. It is found to be red. Find the probability that it form urn A_2.

8.. A discrete variable X ahs the following probability function

X	1	2	3	4	5	6	7	8
P(x)	2a	4a	6a	8a	10a	12a	14a	a

Determine the value of a and P (X < 3) and P (X > 5).Also find the distribution function.

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UNIVERSITY EXAMINATION QUESTION PAPER FEEDBACK FORM

(To be submitted to the Principal immediately after completion of University Examination for every Course)

1. *This feedback form is intended for staff in-charge concerned to complete after consultation with their HoDs and teachers teaching similar courses in the college.*
2. *Please provide a comment on the following aspects of the question papers giving specific feedback where necessary*
3. *Your opinions are valued and would be greatly appreciated.*

Course code and Title: MA8402 & Probability & Queueing Theory

Dept: CSE Year/Sem: II/IV Exam.Date: 08/07/2022

Staff in-Charge: R. SRIKUMAR Designation: Asst. Prof. Dept: S&H(MATHS)

I Difficulty of the Paper		Part A	Part B
	a) Number of Questions are easy	6	2
	b) Number of Questions are average	2	2
	c) Number of Questions are difficult	2	1
II Number and Percentage of questions for which answers are not discussed in the class		–	–
III Number and Percentage of questions from Question bank		80%	80%.

IV List of Questions found out of syllabus (specify Question Number alone)

		Question No	Number of Questions	% of Questions
	a) Part - A	–	–	
	b) Part - B	–	–	–

VI We shall appreciate any further comment on other aspects of the question papers that have not been indicated above attach or write these comments separately below.

Question paper is moderate.

R Srikumar
Staff in-charge

M. Mukesh
HOD

Principal

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Industrial visit /Inplant training /Internship Report

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HIROTEC

10.01.2022

INTERNSHIP ACCEPTANCE LETTER

We are pleased to give accept your internship request for your Mechanical Engineering students. They can join the Internship training in our organization during the period from 19.01.2022 to 28.01.2022. During the internship they have to follow the rules and regulations of the company.

We wish him best wishes in future endeavors.

Regards

ARJUN SHANKAR.A

Manager- HR

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BULL

28.12.2021

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We wish him best wishes in future endeavors.

Regards

K.VEERA
Manager- HR

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Student Project Report

ANNA UNIVERSITY: CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this project report "**COMPARISON OF ALGORITHMS IN PV SYSTEM**" is the bonafide work of "**HARI KISHOR KUMAR, MOHMMED IMRAN J, MARIS RAHUL K, VARUN PS**" who carried out the project work under my supervision.

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Submitted for the project viva-voce held on 25-06-2022

INTERNAL EXAMINER

EXTERNAL EXAMINER

ABSTRACT

In the photovoltaic system the load connected is nonlinear which creates harmonics in the panel during the maximum power point tracking (MPPT). This is one among the main causes for the efficiency drop in maximum power point tracking (MPPT). There is a wide spectrum or discrete frequencies of harmonics produced by the inverter. If the harmonics created by the inverter are reduced, the efficiency of PV panel can be maintained. At constant duty cycle, applying fast sampling rate will increase the system efficiency and also increases the harmonics production with increased output voltage.

In the proposed system, perturb and observe algorithm and incremental conductance algorithms are used to reduce the harmonics in the PV system, in order to maintain the efficiency of the photovoltaic system. In perturb and observe algorithm, the voltage is perturbed in forward direction and then in reverse directions towards maximum power point. In incremental conductance algorithm, the voltage and current is taken as feedback to achieve maximum power. By employing random sampling interval between slow and fast, the interharmonics can be effectively reduced. The performance and effectiveness are validated experimentally based on the reduced level of harmonics and efficiency of MPPT in PV system.

CHAPTER 7

CONCLUSION

The disadvantage of Perturb and Observe method to track the peak power accurately under fast varying atmospheric conditions is overcome by incremental conductance method. The output voltage of Incremental Conductance is high. Total Harmonic Distortion created is low while using Incremental Conductance MPPT Algorithm when compared with P&O algorithm. By implementing random samplings the interharmonics are reduced. The efficiency is also maintained by the usage of Incremental conductance algorithm.