COURSE FILE

Artificial Intelligence Deep Learning (BTETPE703B)

Subject Teacher
Ms. SNEHAL SUNIL GAIKWAD

FINAL YEAR (Semester VII)

Electronics and Telecommunication Engineering

Dr. Babasaheb Ambedkar Technological University, Lonere

2022-2023

Name of the Course	BTETPE703B: Artificial Intelligence Deep Learning
Course Content	**UNIT 1: Introduction:** What Is AI? Thinking humanly: The cognitive modeling approach. Thinking rationally: The "laws of thought" approach, Acting rationally: The rational agent approach. The Foundations of Artificial Intelligence, Mathematics, Economics, Neuroscience, Computer engineering, The History of Artificial Intelligence. AI becomes an industry (1980-- present). Agents and Environments, Good Behaviour: The Concept of Rationality. The Nature of Environments. The Structure of Agents. **UNIT – 2: Search Techniques:** Problem-Solving Agents, Well-defined problems and solutions, Formulating problems, Real- world problems. Uninformed Search Strategies, Breadth-first search, Uniform-cost search, Depth-first search, Depth-limited search, Iterative deepening depth-first search, Bidirectional search, Informed (Heuristic) Search Strategies, Greedy best-first search, A* search: Minimizing the total estimated solution cost, Heuristic Functions. The effect of heuristic accuracy on performance. Beyon Classical Search, Local Search Algorithms and Optimization Problems, Local Search in Continuous Spaces. **UNIT – 3: Game Playing:** Games, Optimal Decisions in Games, The minimax algorithm, Optimal decisions in multiplayer games, Alpha Beta Pruning, Move ordering, Imperfect Real-Time Decisions, Cutting off search, Forward pruning, Stochastic Games, Evaluation functions for games of chance, Partially Observable Games, Krieg spiel: Partially observable chess, Card games, State-of-the-Art Game Programs, Alternative Approaches. **UNIT – 4: Logic and inference:** Defining Constraint Satisfaction Problems, Constraint Propagation: Inference in CSPs, Backtracking Search for CSPs, Local Search for CSPs, The Structure of Problems, Knowledge-Based Agents, The Wumpus World, Logic , Propositional Logic: A Very Simple Logic, Propositional Theorem Proving, Effective Propositional Model Checking, Agents Based on Propositional Logic. Forward Chaining, Backward Chaining, Definition of Classical Planning. Algorithms for Planning as State-Space Search, Planning Graphs. **UNIT – 5: Learning:** Forms of Learning, Supervised Learning, Learning Decision Trees, Evaluating and Choosing the Best Hypothesis, Model selection: Complexity versus goodness of fit, From error rates to loss, Regularization, The Theory of Learning, Regression and Classification with Linear Models, Artificial Neural Networks, Nonparametric Models, Ensemble Learning, Online

	Learning, Practical Machine Learning, A Logical Formulation of Learning. Knowledge in Learning. Explanation-Based Learning, Learning Using Relevance Information. Inductive Logic Programming. Statistical Learning. Learning with Complete Data. Learning with Hidden Variables: The EM Algorithm.
Text/ Reference Books	1. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach. III Edition 2. E. Rich, K. Knight & S. B. Nair - Artificial Intelligence, 3/e, McGraw Hill. 3. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, Prentice Hal of India. 4. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem Solving", Fourth Edition, Pearson Education, 2002. 5. N.P. Padhy "Artificial Intelligence and Intelligent Systems" , Oxford UniversityPress- 2015.

Dr. Babasaheb Ambedkar Technological University, Lonere

Department of Electronics and Telecommunication Engineering

TEACHING PLAN 2022-2023(Odd Semester)

BTETPE703B: Artificial Intelligence Deep Learning

Marking Scheme: CA1- 10 Marks CA1- 10 Marks Mid Semester-20 Marks

Semester Examination- 60 marks (Conducted by Examination Section)

Syllabus:

Unit No.	Chapter Name	Lecture No.	Topics
I	Introduction	1	Introduction to AI and deep learning
		2	What Is AI? Thinking humanly: The cognitive modeling approach. Thinking rationally: The "laws of thought" approach,
		3	Acting rationally: The rational agent approach. The Foundations of Artificial Intelligence, Mathematics, Economics, Neuroscience, Computer engineering,
		4	The History of Artificial Intelligence. AI becomes an industry (1980-- present).
		5	Agents and Environments, Good Behaviour: The Concept of Rationality.
		6,7	The Nature of Environments. The Structure of Agents.
II	Search Techniques	8	Problem-Solving Agents, Well-defined problems and solutions, Formulating problems, Real- world problems.
		9	Uninformed Search Strategies, Breadth-first search, Examples
		10, 11	Uniform-cost search, Depth-first search, Examples
		12, 13	Depth-limited search, Iterative deepening depth-first search, Examples
		14, 15	Bidirectional search, Informed (Heuristic) Search Strategies, Greedy best-first search, Examples
		16, 17	A* search: Minimizing the total estimated solution cost, Heuristic Functions. Examples
		18, 19	The effect of heuristic accuracy on performance. Beyon Classical Search, Examples
		20, 21	Local Search Algorithms and Optimization Problems, Local Search in Continuous Spaces, Examples
III	Game Playing	22, 23	Games, Optimal Decisions in Games, The minimax algorithm, Optimal decisions in multiplayer games,
		24, 25	Alpha Beta Pruning, Move ordering, Imperfect Real-Time Decisions, Cutting off search,
		26	Forward pruning, Stochastic Games, Evaluation functions for games of chance,
		27, 28	Partially Observable Games, Krieg spiel: Partially observable chess, Card games, State-of-the-Art Game Programs, Alternative Approaches.

		29	Problems solving
IV	Logic and inference	30	Defining Constraint Satisfaction Problems, Constraint Propagation: Inference in CSPs,
		31, 32	Backtracking Search for CSPs, Local Search for CSPs, The Structure of Problems,
		33, 34	Knowledge-Based Agents, The Wumpus World, Logic, Propositional Logic: A Very Simple Logic, Propositional Theorem Proving,
		35	Effective Propositional Model Checking, Agents Based on Propositional Logic. Forward Chaining, Backward Chaining,
		36, 37	Definition of Classical Planning. Algorithms for Planning as State-Space Search, Planning Graphs.
		38, 39	Problems solving
VI	Learning	40, 41	Forms of Learning, Supervised Learning, Learning Decision Trees, Evaluating and Choosing the Best Hypothesis,
		42	Model selection: Complexity versus goodness of fit, From error rates to loss, Regularization,
		43	The Theory of Learning, Regression and Classification with Linear Models,
		44, 45	Artificial Neural Networks, Nonparametric Models, Ensemble Learning, Online Learning,
		46	Practical Machine Learning, A Logical Formulation of Learning. Knowledge in Learning.
		47	Explanation-Based Learning, Learning Using Relevance Information. Inductive Logic Programming
		48, 49	Statistical Learning. Learning with Complete Data. Learning with Hidden Variables: The EM Algorithm
		50	Problem solving and discussion

Reference /Text books:

1. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach. III Edition
2. E. Rich, K. Knight & S. B. Nair - Artificial Intelligence, 3/e, McGraw Hill.
3. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, Prentice Hal of India.
4. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem Solving", Fourth Edition, Pearson Education, 2002.
5. N.P. Padhy "Artificial Intelligence and Intelligent Systems", Oxford University Press- 2015.

Course Coordinator: Snehal Sunil Gaikwad.

Program Outcomes:

PO1	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
PO5	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcomes:

Upon successful completion of the course, the students will be able to

CO1: Solve basic AI based problems.

CO2: Define the concept of Artificial Intelligence.

CO3: Apply AI techniques to real-world problems to develop intelligent systems.

CO4: Select appropriately from a range of techniques when implementing intelligent systems.

Course outcomes and Programme outcomes mapping table

Course Outcomes	Programme Outcomes				
	PO1	PO2	PO3	PO4	PO5
CO1	medium	high	high	high	medium
CO2	low		high	high	-
CO3	-	-	high	-	high
CO4	-	high	-	-	high

Master Timetable:

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.
Department of Electronics & Telecommunication Engineering
W.E.F. March 2022

		09:00-10:00	10:00-11:00	11:00-12:00	12:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00
MON	III-A		EM-III[104]	DE(NSJ)[104]		LUNCH	EDC(JSK)[106]		DE[A](KSK)/EDC[B](RKB)	
	III-B		DE(PSB)[106]		EM-III[104]		EMI(UPP)[104]		EDC(PSB)[104]	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	CSE(RKB)[101]		DSP[A](PPI)/ACOMM[B](TUM)			
	V-B	DSP[D](SSG)/ACOMM[E](AAJ)		ACOMM(AAJ)[106]	DSP(SSG)[106]		DSD(KSK)[101]		EMFT(AAJ)[101]	
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]		MTT[A](UPP)/FOC[A](JSK)/WSN[A](SM)				AIDL(SSG)[101], VLSI(NSJ)[106], DCE(AAP)[104]	DC(PPI)[106]	AICO(PPM)[101], ESC(MRM)[106]
	VII-B									
TUE	III-A	DE[C](TUM)/EDC[D](PSB)		DE(NSJ)[104]		LUNCH	EDC(JSK)[104]	EMI(UPP)[104]	EM-III[104]	
	III-B		EMI(UPP)[104]		EM-III[104]		DE(PSB)[101]		DE[E](KSK)/EDC[F](AAJ)	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]			DSD(KSK)[101]	DSP[C](AAP)/ACOMM[A](TUM)	
	V-B	DSP[F](PPI)/ACOMM[D](MRM)		ACOMM(AAJ)[106]	DSD(KSK)[106]		EMFT(AAJ)[106]	DSP(SSG)[106]		
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]	DCE(AAP)[104]	MTT[B](SM)/FOC[B](JSK)/WSN[B](RKB)			MECH[A](PPM)			AIDL(SSG)[101], VLSI(NSJ)[106]
	VII-B								DC(PPI)[106]	
WED	III-A	DE[B](PPI)/EDC[C](RKB)		DE(NSJ)[104]	EDC(JSK)[104]	LUNCH			EMI(UPP)[104]	
	III-B		EDC(PSB)[106]		EM-III[106]		EMI(UPP)[104]		DE[G](PPI)/EDC[H](AAJ)	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]		DSP[B](AAP)/ACOMM[C](MRM)			
	V-B	DSP[E](SSG)/ACOMM[F](KSK)		ACOMM(AAJ)[106]			CSE(RKB)[101]		DSD(KSK)[101]	DSP(SSG)[104]
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]	DCE(AAP)[104]	AIDL[A](SSG)/VLSI[A](PSB)/DCE[A](AAP)				AIDL(SSG)[101], VLSI(NSJ)[106]	FM(AAP)[106]	AICO(PPM)[101], ESC(MRM)[106]
	VII-B						DC(PPI)[106]			
THU	III-A			DE(NSJ)[104]		LUNCH	DE[D](UPP)/EDC[A](JSK)			
	III-B	DE[F](TUM)/EDC[G](JSK)			EM-III[104]			EDC(PSB)[106]	DE(PSB)[106]	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]			DSD(KSK)[101]	CSE(RKB)[101]	
	V-B			ACOMM(AAJ)[106]			EMFT(AAJ)[104]	CSE(RKB)[104]	DSD(KSK)[104]	DSP(SSG)[104]
	VII-A	MECH(PPM)[101]	DC(PPI)[106]	AIDL[B](SSG)/VLSI[B](SM)/DCE[B](AAP)			FM(AAP)[106]	MECH[B](PPM)		AICO(PPM)[101], ESC(MRM)[106]
	VII-B		FM(AAP)[104]				DC(PPI)[101]			
FRI	III-A		EM-III[104[	EM-III[104]	EDC(JSK)[104]	LUNCH		EMI(UPP)[104]	EMI(UPP)[104]	
	III-B	DE[H](UPP)/EDC[E](PSB)			EMI(UPP)[101]		EDC(PSB)[106]	DE(PSB)[106]		
	V-A			DSD(KSK)[101]			ACOMM(MRM)[101]	DSD(KSK)[101]	CSE(RKB)[101]	CSE(RKB)[101]
	V-B			CSE(RKB)[106]	CSE(RKB)[106]		EMFT(AAJ)[104]			
	VII-A		DC(PPI)[106]	AICO[A](PPM)/ESC[A](MRM)			AICO[B](PPM)/ESC[B](SM)		MECH(PPM)[104]	MECH(PPM)[104]
	VII-B		FM(AAP)[101]							
SAT	VII-A			GATE COACHING			GATE COACHING			DEPARTMENTAL METTING
	VII-B									

Individual Timetable:

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.
Department of Electronics & Telecommunication Engineering
W.E.F. March 2022

		09:00-10:00	10:00-11:00	11:00-12:00	12:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00
MON	III-A		EM-III[104]	DE(NSJ)[104]		LUNCH	EDC(JSK)[106]		DE[A](KSK)/EDC[B](RKB)	
	III-B		DE(PSB)[106]		EM-III[104]		EMI(UPP)[104]		EDC(PSB)[104]	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	CSE(RKB)[101]		DSP[A](PPI)/ACOMM[B](TUM)			
	V-B	DSP[D](SSG)/ACOMM[E](AAJ)		ACOMM(AAJ)[106]	DSP(SSG)[106]		DSD(KSK)[101]		EMFT(AAJ)[101]	
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]		MTT[A](UPP)/FOC[A](JSK)/WSN[A](SM)				AIDL(SSG)[101], VLSI(NSJ)[106], OCE(AAP)[104]	DC(PPI)[106]	AICO(PPM)[101], ESC(MRM)[106]
	VII-B									
TUE	III-A	DE[C](TUM)/EDC[D](PSB)		DE(NSJ)[104]		LUNCH	EDC(JSK)[104]	EMI(UPP)[104]	EM-III[104]	
	III-B		EMI(UPP)[104]		EM-III[104]		DE(PSB)[101]		DE[E](KSK)/EDC[F](AAJ)	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]			DSD(KSK)[101]	DSP[C](AAP)/ACOMM[A](TUM)	
	V-B	DSP[F](PPI)/ACOMM[D](MRM)		ACOMM(AAJ)[106]	DSD(KSK)[106]		EMFT(AAJ)[106]	DSP(SSG)[106]		
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]	DCE(AAP)[104]	MTT[B](SM)/FOC[B](JSK)/WSN[B](RKB)			MECH(A)(PPM)			AIDL(SSG)[101], VLSI(NSJ)[106]
	VII-B								DC(PPI)[106]	
WED	III-A	DE[B](PPI)/EDC[C](RKB)		DE(NSJ)[104]	EDC(JSK)[104]	LUNCH			EMI(UPP)[104]	
	III-B		EDC(PSB)[106]		EM-III[106]		EMI(UPP)[104]		DE[G](PPI)/EDC[H](AAJ)	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]		DSP[B](AAP)/ACOMM[C](MRM)			
	V-B	DSP[E](SSG)/ACOMM[F](KSK)		ACOMM(AAJ)[106]			CSE(RKB)[101]		DSD(KSK)[101]	DSP(SSG)[104]
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]	DCE(AAP)[104]	AIDL[A](SSG)/VLSI[A](PSB)/OCE[A](AAP)				AIDL(SSG)[101], VLSI(NSJ)[106]	FM(AAP)[106]	AICO(PPM)[101], ESC(MRM)[106]
	VII-B						DC(PPI)[106]			
THU	III-A			DE(NSJ)[104]		LUNCH	DE[D](UPP)/EDC[A](JSK)			
	III-B	DE[F](TUM)/EDC[G](JSK)			EM-III[104]			EDC(PSB)[106]	DE(PSB)[106]	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]			DSD(KSK)[101]	CSE(RKB)[101]	
	V-B			ACOMM(AAJ)[106]			EMFT(AAJ)[104]	CSE(RKB)[104]	DSD(KSK)[104]	DSP(SSG)[104]
	VII-A	MECH(PPM)[101]	DC(PPI)[106]	AIDL[B](SSG)/VLSI[B](SM)/OCE[B](AAP)			FM(AAP)[106]	MECH[B](PPM)		AICO(PPM)[101], ESC(MRM)[106]
	VII-B		FM(AAP)[104]				DC(PPI)[101]			
FRI	III-A		EM-III[104[	EM-III[104]	EDC(JSK)[104]	LUNCH		EMI(UPP)[104]	EMI(UPP)[104]	
	III-B	DE[H](UPP)/EDC[E](PSB)			EMI(UPP)[101]		EDC(PSB)[106]	DE(PSB)[106]		
	V-A			DSD(KSK)[101]			ACOMM(MRM)[101]	DSD(KSK)[101]	CSE(RKB)[101]	CSE(RKB)[101]
	V-B			CSE(RKB)[106]	CSE(RKB)[106]		EMFT(AAJ)[104]			
	VII-A		DC(PPI)[106]	AICO[A](PPM)/ESC[A](MRM]			AICO[B](PPM)/ESC[B](SM)		MECH(PPM)[104]	MECH(PPM)[104]
	VII-B		FM(AAP)[101]							
SAT	VII-A			GATE COACHING			GATE COACHING			DEPARTMENTAL METTING
	VII-B									

Attendance record

Dr. Babsaheb Ambedkar Technological University, Lonere

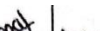
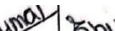
Department of EXTC **Semester VII** **Sub: Artificial Intelligence Deep Learning**

Enrolment No.	Name	19/09	20/09	21/09	26/09	27/09	03/10	10/10	11/10	12/10		CA1
1930331372003	Sakshi Sunil Dhumal											10
1930331372033	Ashwini Shirke										P	08
1930331372055	Vivek Shrinivas Panchal										P	08
1930331372104	Aditya Kiran Pimple										P	09
1930331372116	Rushikesh Maruti Mane										P	03
1930331372064	Kartik Sudhakar Waghmare										P	05
1930331372076	Akshay Dnyanoba Fawade										P	04
1930331372093	Adesh Santosh Salsundar										P	07
1930331372112	Prathamesh Junghare										P	09
1930331372008	Shivprasad Ganesh Gonare										P	08
1930331372032	prajwal sunil birwadkar										P	06
1930331372068	Tanu Sudhakarrao Patil										P	08
1930331372084	SHRADDHA GARAT										P	06
1930331372061	Shivdatta Kokane										P	06
1930331372083	Tathagat bhaskar shirsale										P	08
1930331372088	Deepak Sheshrao Lokhande										P	05

Dr. Babsaheb Ambedkar Technological University, Lonere

Department of EXTC **Semester VII** **Sub: Artificial Intelligence Deep Learning**

Enrolment No.	Name	19/09	20/09	21/09	26/09	27/09	03/10	10/10	11/10	12/10		CA1
2030331372005	Tanvi Rajan Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	P	10
2030331372012	Snehal Dilip More	—	—	—	—	—	—	More	More	More	Ab	06
2030331372016	Mahadeo Samadhan Lokhande	—	—	—	—	—	—	—	—	—	—	—
2030331372010	Pranita Dattatraya JadhavDongare	Pranita	Pranita	Pranita	Pranita	Pranita	Pranita	Pranita	Pranita	Pranita	P	10
2030331372020	Jadhav Mahesh Sachin	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	P	06
2030331372001	Panchal shaila shesherao	Shaila	Shaila	Shaila	Shaila	Shaila	Shaila	Shaila	Shaila	Shaila	Ab	07
1930331372058	Madan Narayan Bhosale	Madan	Madan	Madan	Madan	Madan	Madan	Madan	Madan	Madan	P	08
2030331372021	Sainath dhondiba mehtre	Smehtre	Smehtre	Smehtre	Smehtre	Smehtre	Smehtre	Smehtre	Smehtre	Smehtre	Ab	04
1930331372004	Sayali Pradeep Wagh	Sayali	Sayali	Sayali	Sayali	Sayali	Sayali	Sayali	Sayali	Sayali	P	10
1930331372066	Omkar Changdev Babar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	Omkar	P	07
2030331372003	Sanchita Shyamrao Reddy	Sanchita	Sanchita	Sanchita	Sanchita	Sanchita	Sanchita	Sanchita	Sanchita	Sanchita	P	06
1930331372081	Rameshwari Dattatray Bodhankar	RBodhankar	RBodhankar	RBodhankar	RBodhankar	RBodhankar	RBodhankar	RBodhankar	RBodhankar	RBodhankar	P	10
1930331372098	Abhishek Sanjeev Raut	—	—	Abhishek	Abhishek	Abhishek	Abhishek	Abhishek	Abhishek	Abhishek	P	08
1930331372012	Kanchan Vilas Misal	Kmisal	Kmisal	Kmisal	Kmisal	Kmisal	Kmisal	Kmisal	Kmisal	Kmisal	P	10
1930331372077	Ankita Satish Kulkarni	Ankita	Ankita	Ankita	Ankita	Ankita	Ankita	Ankita	Ankita	Ankita	P	10
1930331372015	Pratiksha. Vinod Pawar.	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar		Pawar	Pawar	P.	6

1930331372003	Sakshi Sunil Dhumal									
1930331372033	Ashwini Shirke									
1930331372055	Vivek Shrinivas Panchal									
1930331372104	Aditya Kiran Pimple									
1930331372116	Rushikesh Maruti Mane									
1930331372064	Kartik Sudhakar Waghmare									
1930331372076	Akshay Dnyanoba Fawade									
1930331372093	Adesh Santosh Salsundar									
1930331372112	Prathamesh Junghare									
1930331372008	Shivprasad Ganesh Gonare									
1930331372032	prajwal sunil birwadkar									
1930331372068	Tanu Sudhakarrao Patil									
1930331372084	SHRADDHA GARAT									
1930331372061	Shivdatta Kokane									
1930331372083	Tathagat bhaskar shirsale									
1930331372088	Deepak Sheshrao Lokhande									

2030331372005	Tanvi Rajan Patil									
2030331372012	Snehal Dilip More	—								
2030331372016	Mahadeo Samadhan Lokhande	—								
2030331372010	Pranita Dattatraya JadhavDongare									
2030331372020	Jadhav Mahesh Sachin									
2030331372001	Panchal shaila shesherao									
1930331372058	Madan Narayan Bhosale									
2030331372021	Sainath dhondiba mehtre									
1930331372004	Sayali Pradeep Wagh									
1930331372066	Omkar Changdev Babar									
2030331372003	Sanchita Shyamrao Reddy									
1930331372081	Rameshwari Dattatray Bodhankar									
1930331372098	Abhishek Sanjeev Raut	—	—							
1930331372012	Kanchan Vilas Misal									
1930331372077	Ankita Satish Kulkarni									
1930331372015	Pratiksha. Vinod Pawar.									

Assessment of Course Outcomes through CA1 and CA2

Sr. no.	Relevant Course Outcomes	CO1, CO2	CO3, CO4
	ROLL NO	CA1 (10)	CA2 (10)
1	2030331372005	9	9
2	2030331372012	7	7
3	2030331372010	9	9
4	2030331372020	8	8
5	2030331372001	8	8
6	1930331372058	9	9
7	2030331372021	7	7
8	1930331372004	10	10
9	1930331372066	8	8
10	2030331372003	8	8
11	1930331372081	10	10
12	1930331372098	8	8
13	1930331372012	8	8
14	1930331372077	9	9
15	1930331372015	8	8
16	1930331372003	9	9
17	1930331372033	8	8
18	1930331372055	9	9
19	1930331372104	8	8
20	1930331372116	7	7
21	1930331372064	8	8
22	1930331372076	8	8
23	1930331372093	8	8
24	1930331372112	9	9
25	1930331372008	8	8
26	1930331372032	8	8
27	1930331372068	9	9
28	1930331372084	9	9
29	1930331372061	8	8
30	1930331372083	8	8
31	1930331372088	7	7
Average		**8.29**	**8.29**
%		**82.90**	**82.90**

Assessment of Course Outcomes through MSE

Sr. no.	Relevant Course Outcomes	CO1, CO2	CO1, CO3	CO2, CO4	CO3, CO4	CO2, CO3	
	ROLL NO	Q.1	Q.2	Q.3	Q.4	Q.5	Total (20)
1	2030331372005	4	4	3	3	3	17
2	2030331372012	2	1	1	0	0	4
3	2030331372010	3	4	4	3	3	17
4	2030331372020	2	1	2	0	2	7
5	2030331372001	2	2	0	2	0	6
6	1930331372058	3	4	4	3	3	17
7	2030331372021	1	1	0	1	1	4
8	1930331372004	4	4	4	4	4	20
9	1930331372066	3	2	1	4	4	14
10	2030331372003	2	1	2	2	2	9
11	1930331372081	4	4	4	4	4	20
12	1930331372098	3	3	2	4	4	16
13	1930331372012	3	2	2	4	4	15
14	1930331372077	3	4	4	3	3	17
15	1930331372015	3	1	3	0	2	9
16	1930331372003	3	4	4	3	3	17
17	1930331372033	2	1	4	0	4	11
18	1930331372055	3	4	4	3	3	17
19	1930331372104	3	3	2	4	4	16
20	1930331372116	1	1	0	1	1	4
21	1930331372064	3	1	3	1	2	10
22	1930331372076	2	1	2	0	2	7
23	1930331372093	3	0	3	0	2	8
24	1930331372112	3	4	4	3	3	17
25	1930331372008	2	2	0	2	0	6
26	1930331372032	4	1	3	0	2	10
27	1930331372068	4	2	3	1	2	12
28	1930331372084	3	2	4	1	0	10
29	1930331372061	3	1	3	0	2	10
30	1930331372083	3	1	3	0	2	10
31	1930331372088	0	0	0	0	0	0
Average		**2.71**	**2.13**	**2.52**	**1.81**	**2.29**	**11.52**
%		**67.75**	**53.25**	**63**	**45.25**	**57.25**	**57.60**

Assessment of Course Outcomes

Course Outcomes	Assessment Tool	Contribution to Programme outcomes in %					Attainment level of course outcomes (%)		Achievement (Goal: 70%) In Yes/No
		PO1	PO2	PO3	PO4	PO5			
CO1	MSE Q.1	**67.75**	**67.75**	**67.75**	**67.75**	**67.75**	**67.75**	**75.97**	Yes
	MSE Q.2	**53.25**	**53.25**	**53.25**	**53.25**	**53.25**	**53.25**		
	CA1	82.90	82.90	82.90	82.90	82.90	82.90		
	Assignment 1	100	100	100	100	100	100		
CO2	MSE Q.1	**67.75**		**67.75**	**67.75**		**67.75**	**74.18**	Yes
	MSE Q.3	**63**		**63**	**63**		**63**		
	MSE Q.5	**57.25**		**57.25**	**57.25**		**57.25**		
	CA1	82.90		82.90	82.90		82.90		
	Assignment 2	100		100	100		100		
CO3	MSE Q.2			**53.25**		**53.25**	**53.25**	**70.68**	Yes
	MSE Q.4			**45.25**		**45.25**	**45.25**		
	MSE Q.5			**57.25**		**57.25**	**57.25**		
	CA2			82.90		82.90	82.90		
	Assignment 2			100		100	100		
	Assignment 3			100		100	100		
CO4	MSE Q.3		**63**			**63**	**63**	**72.78**	Yes
	MSE Q.3		**45.25**			**45.25**	**45.25**		
	CA2		82.90			82.90	82.90		
	Assignment 4		100			100	100		

Assignment No. 1

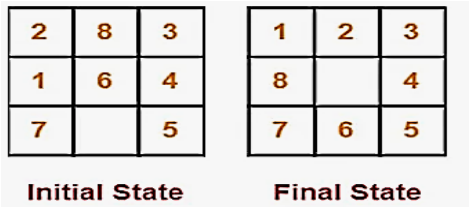
1. What is Artificial Intelligence? List the task domains of Artificial Intelligence (AI).
2. What is Artificial Intelligence? Steps to Solve Problems in Artificial Intelligence.
3. What are the Agents in Artificial Intelligence. (https://www.geeksforgeeks.org/agents-artificial-intelligence/?ref=lbp)
4. What are the Types of Environments in AI. (https://www.geeksforgeeks.org/types-of-environments-in-ai/?ref=lbp)
5. Difference between Informed and Uninformed Search in AI (https://www.geeksforgeeks.org/difference-between-informed-and-uninformed-search-in-ai/?ref=lbp)
6. Turing Test in Artificial Intelligence.

Assignment No. 2

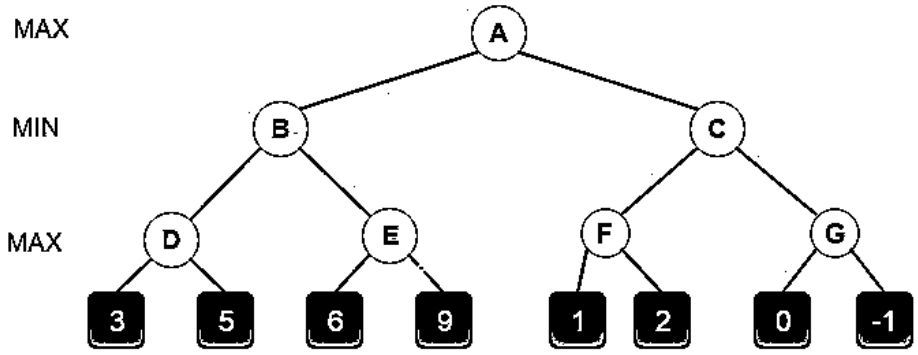
1. Define State Space Search. Explain in detail.
2. Define heuristic function in informed search algorithm.
3. Explain Breadth-first search (BFS) with an example. List down the advantages and disadvantages.
4. Write down the algorithm for Depth first search (DFS) along with an example. List down the advantages and disadvantages.
5. What do you mean by heuristic and heuristic search? What are the advantages of Heuristic Search?
6. Write and explain the A* algorithm with advantages and disadvantages.
7. What are the problem-solving and problem formulation steps in AI. (https://www.geeksforgeeks.org/problem-solving-in-artificial-intelligence/?ref=gcse)
8. Explain with example Iterative Deepening Depth First Search (IDDFS). (https://www.geeksforgeeks.org/iterative-deepening-searchids-iterative-deepening-depth-first-searchiddfs/?ref=gcse)
9. Explain the working of Greedy-Best-first search algorithm? Give advantages, disadvantages and applications. (https://www.geeksforgeeks.org/greedy-best-first-search-algorithm/?ref=gcse)

Assignment No. 3

1. Explain the water Jug problem as a state-space search.
2. Write and explain hill-climbing and steepest hill-climbing search algorithms in artificial intelligence.
3. A star Search Algorithm to Move from the start state to the final state 8 Puzzle Problem.



4. Explain the alpha-beta search algorithm. Also solve the following example using Alpha beta pruning. (https://www.geeksforgeeks.org/minimax-algorithm-in-game-theory-set-4-alpha-beta-pruning/?ref=gcse)



5. Given n, of a n x n chessboard, find the proper placement of queens on chessboard. (https://www.geeksforgeeks.org/n-queen-in-on-space/?ref=lbp)
6. What is Mini-max search for game playing. Explain the Min Max algorithm.(https://www.geeksforgeeks.org/minimax-algorithm-in-game-theory-set-1-introduction/?ref=gcse)

Assignment No. 4

1. Write a note on propositional logic, forward chaining, backward chaining.
2. Explain the following planning methods 1. Planning with State-Space Search 2. Goal Stack Planning.
3. i. What is the difference between supervised and unsupervised learning.
   ii. Write a note on linear regression.
4. What is Ensemble Learning? What are the types of ensemble learning?
5. Write a note on Expectation-Maximization (EM) algorithm.

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE-402103

Department of Electronics and Telecommunication Engineering

Mid Semester Examination

Class: B. Tech (Final Year) **Semester: VII**

Subject: Artificial Intelligence and Deep Learning (BTETPE703B) **Total Marks: 20**

Date: 31/10/2022 **Time: 10:00 am to 11:00 am**

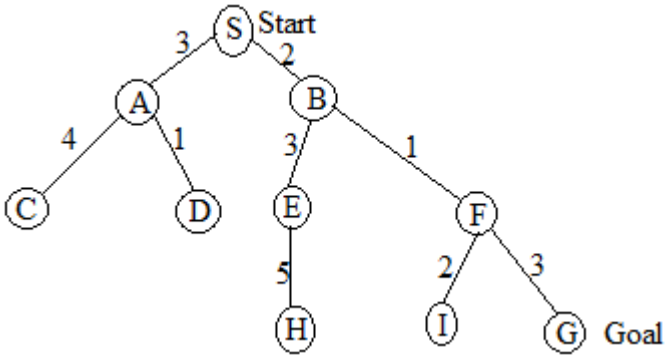
SOLVE ALL THE QUESTIONS.

Q. 1 What are the informed search strategies. Explain Best First Search algorithm with its characteristics. (04)

Q. 2 Explain briefly the different types of agent architectures (04)

Q. 3 What are the uninformed search strategies. Explain Breadth First Search with algorithm and its characteristic. (04)

Q. 4 (04)



Node	h(n)
S	13
A	12
B	4
C	7
D	3
E	8
F	2
H	4
I	9
G	0

Provide the solution from start node to goal node at each iteration using Greedy BFS algorithm.

Q. 5 Define AI. Explain the concept of Turing test. (04)

*******All the Best*******

COURSE FILE

EMPLOYABILITY AND SKILL DEVELOPMENT

[BTHM605]

Subject Teacher: Ms. Ratika R. Jadhav

Third Year

Electronics and Telecommunication Engineering

Dr. Babasaheb Ambedkar Technological University, Lonere

2022-23

INDEX

SYLLABUS

UNIT - 1

Soft Skills & Communication basics:

Soft skills Vs hard skills, Skills to master, Interdisciplinary relevance, Global and national perspectives on soft skills, Resume, Curriculum vitae, How to develop an impressive resume, Different formats of resume – Chronological, Functional, Hybrid, Job application or cover letter, Professional presentation- planning, preparing and delivering presentation, Technical writing.

UNIT - 2

Interpersonal Skills:
Critical Thinking, Assertiveness, Decision Making, Problem Solving, Negotiation, Building Confidence, Time Management, Personal Presentation, Assertiveness, negotiation, avoiding Stress.

Commercial Awareness:
Professional etiquettes and manners, Global negotiating and Persuading, Integrity. Global trends and statistics about civil engineering businesses.

UNIT - 3

Grammar and Comprehension:

English sentences and phrases, Analysis of complex sentences, Transformation of sentences, Paragraph writing, Story writing, Reproduction of a story, Letter writing, précis writing, Paraphrasing and e-mail writing.

UNIT - 4

Skills for interviews:
Interviews- types of interviews, preparatory steps for job interviews, interview skill tips, Group discussion- importance of group discussion, types of group discussion, difference between group discussion, panel discussion and debate, personality traits evaluated in group discussions, tips for successful participation in group discussion, Listening skillsvirtues of listening, fundamentals of good listening, Non-verbal communication-body movement, physical appearance, verbal sounds, closeness, time.

UNIT - 5

Problem Solving Techniques:
Problem solving model: 1. Define the problem, 2. Gather information, 3. Identify various solution, 4. Evaluate alternatives, 5. Take actions, 6. Evaluate the actions. Problem solving skills: 1. Communicate. 2. Brain storming, 3. Learn from mistakes.

TEXT/REFERENCE BOOKS

1. R. Gajendra Singh Chauhan, Sangeeta Sharma, “Soft Skills- An integrated approach to maximize personality”, ISBN: 987-81-265-5639-7, First Edition 2016, WileyWren and Martin, "English grammar and Composition", S. Chandpublications.

2. R. S. Aggarwal, "A modern approach to verbal reasoning", S. Chandpublications.

3. Philip Carter, "The Complete Book of Intelligence Test", John Willey & SonsLtd.

4. Philip Carter, Ken Russell, "Succeed at IQ test", KoganPage.

5. Eugene Ehrlich, Daniel Murphy, "Schaum‟s Outline of English Grammar", McGraw Hills.

6. David F. Beer, David A. McMurrey, “A Guide to Writing as an Engineer”, ISBN: 978- 1-118-30027-5 4th Edition, 2014, Wiley.

Course Outcomes

On completion of the course, student will be able to:

1. Have skills and preparedness for aptitude tests.
2. Be equipped with essential communication skills (writing, verbal and non-verbal)
3. Master the presentation skill and be ready for facing interviews.
4. Build team and lead it for problem solving.

Program Outcomes

1. **Aptitude Test Proficiency:**
    - Graduates will demonstrate a high level of proficiency in aptitude tests commonly used by employers, enhancing their ability to excel in recruitment processes.
    - Students will consistently achieve scores that place them in the top percentiles of aptitude assessments relevant to their field of study.

2. **Effective Communication Skills:**
    - Graduates will exhibit exceptional written communication skills, capable of producing clear, concise, and persuasive documents for various professional contexts.
    - Graduates will excel in verbal communication, demonstrating the ability to articulate ideas confidently and engage in meaningful conversations.
    - Students will develop strong non-verbal communication skills, including body language and active listening, to effectively convey their messages and build rapport.

3. **Mastery of Presentation and Interview Skills:**
    - Graduates will master the art of presentations, showcasing the ability to deliver compelling and informative presentations to diverse audiences.
    - Students will be well-prepared for interviews, displaying confidence, professionalism, and effective responses to common interview questions.
    - Graduates will demonstrate the capacity to adapt their interview and presentation skills to various professional settings and industries.

4. **Team Leadership and Problem-Solving:**
    - Graduates will possess the skills necessary to build and lead diverse teams effectively, fostering collaboration and innovation.
    - Students will demonstrate proficiency in problem-solving methodologies, using critical thinking and creative problem-solving techniques to address complex challenges.
    - Graduates will consistently contribute to their organizations by leveraging their team leadership and problem-solving abilities to drive positive outcomes.

Overall, this program will equip students with the essential skills and knowledge required for a successful transition into the workforce, ensuring they are not only employable but also capable of thriving in their chosen careers.

Course Outcomes and Program Outcomes Mapping Table

Course Outcomes	Program Outcomes	
	CO1	**CO2**
PO1	High	High
PO2	High	High
PO3	High	Medium
PO4	High	High
PO5	Medium	Medium
PO6	Medium	Medium
PO7	Medium	Medium
PO8	Medium	Medium
PO9	Medium	Medium
PO10	Medium	Medium
PO11	Low	Medium
PO12	Low	Low

Academic Calendar

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by Government of Maharashtra)
विद्याविहार, लोणेरे-रायगड-४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel : (02140) 275142 Student Helpline : 02140-275212
स्वातंत्र्याचा अमृत महोत्सव

Dr. Bhagwan F. Jogi
Registrar
डॉ. भगवान फ. जोगी
कुलसचिव

DBATU /REG/ AC / 2022 /341/A Dated: 17 /02/ 2023

Academic Calendar–UG Sem. VI & VIII Revised(AY 2022–23)

Sr. No.	Activity	Commencement Date	Concluding Date	Total Days	Level
1	Commencement of Classes	20th Feb 23	30th May 23	100	UG
2	Mid Semester Examination	10th April 2023	15th Apr 23	05	UG
3	End of Classes		30th May 23		UG
4	End Semester Examination	1st June 23	10th June 23	10	UG
5	Practical/Project/Seminar Examination	11th June 23	20th June 23	03	UG
6	Result Declaration		15th July 23		
7	Commencement of Classes for Next semester	20th July 23			
Holiday	18 Feb – Mahashivratri 19 Feb – Chatrapati Shivaji Maharaj Jayanti 7 March – Dhulivandan 22 March – Gudi Padwa 30 March – Ram Navami 4 April – Mahavir Jayanti 7 April – Good Friday		14 April – Dr Babasaheb Ambedkar Jayanti 22 April – Ramzan Eid 1 May – Maharashtra Din 5 May – Buddha Pournima 29 June – Bakari Eid		

Dr. B. F. Jogi
Registrar
REGISTRAR
Dr. Babasaheb Ambedkar Technological University
LONERE 402 103.
Tal. Mangaon, Dist. Raigad, (Maharashtra)

Copy submitted for information: Office of Hon'ble Vice-Chancellor
Copy to:
1. All heads of departments
2. Affiliated Institutes
3. Academic Section
4. Controller of Examinations

Dr. Babasaheb Ambedkar Technological University LONERE RAIGAD Maharashtra

Dr. Babasaheb Ambedkar Technological University, Lonere
Department of Electronics and Telecommunication Engineering

Subject: Employability & Skill Development **Subject Code**: **BTHM605**
Class: Third Year **Semester:** VI
Pre-requisite: Communication Skills **Faculty:** Ms. Ratika R. Jadhav

---

Marking Scheme

CA I- 10 marks CA II- 10 marks Mid Sem exam - 20 marks Theory Paper- 60 marks

---

LESSON PLAN 2022-2023

Sr.	Date	UNIT	Contents
1.	3 March to 9 March	**Soft Skills & Communication basics**	Soft skills Vs. hard skills
2.			Skills to master, Interdisciplinary relevance
3.			Global and national perspectives on soft skills
4.			Resume, Curriculum vitae
5.			How to develop an impressive resume,
6.			Different formats of resume – Chronological, Functional, Hybrid
7.			Job application or cover letter, Technical writing.
8.			Professional presentation- planning, preparing, and delivering presentations.
9.	13 March to 23 March	**Interpersonal Skills & Commercial Awareness**	Critical Thinking, Assertiveness
10.			Decision Making, Problem Solving
11.			Building Confidence, Time Management
12.			Personal Presentation, Assertiveness,
13.			Professional etiquettes and manners
14.			Global negotiating and Persuading
15.			Negotiation, Avoiding Stress.
16.			Integrity
17.			Global trends and statistics about civil engineering businesses.
18.	27 March to 12 April	**Grammar and Comprehension**	English sentences and phrases
19.			Analysis of complex sentences
20.			Transformation of sentences
21.			Paragraph writing, Story writing
22.			Reproduction of a story
23.			Letter writing, précis writing

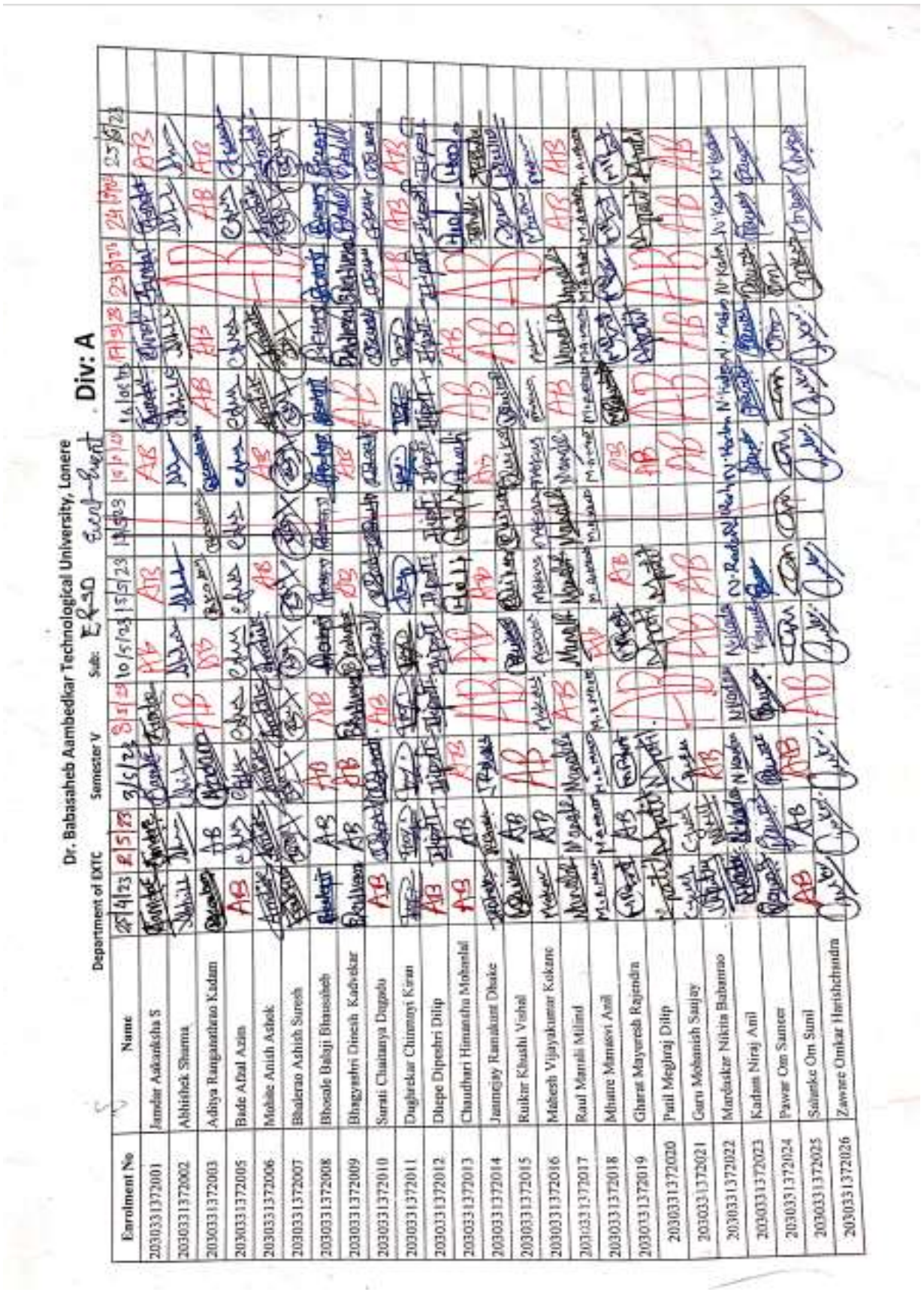
24.			Paraphrasing and e-mail writing.
25.	17 April to 26 April	**Skills for interviews**	Interviews- types of interviews, preparatory steps for job interviews, interview skill tips
26.			Group discussion- importance of group discussion, types of group discussion, difference between group discussion, panel discussion and debate
27.			personality traits evaluated in group discussions, tips for successful participation in group discussion
28.			Listening skills - virtues of listening, fundamentals of good listening,
29.			Non-verbal communication-body movement, physical appearance, verbal sounds, closeness, time.
30.	2 May to 17 May	**Problem-Solving Techniques**	Problem solving model: 1. Define the problem
31.			2. Gather information, 3. Identify various solution
32.			4. Evaluate alternatives,
33.			5. Take actions
34.			6. Evaluate the actions
35.			Problem solving skills: 1. Communicate.
36.			2. Brain storming, 3. Learn from mistakes. .

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.
Department of Electronics & Telecommunication Engineering
W.E.F. February 2023

		09:00-10:00	10:00-11:00	11:00-12:00	12:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00
MON	IV-A		NT(A)[AAJ] / SS(B)[SM] / SEMINAR-II		PP-B (AAJ)[101], COA (UPP)[Lab-109]	LUNCH	BHR()[101]	PP-A (AAJ)[101], DCE (AAP)[104]	SS (SLN)[101]	PTRP(GMK)[101]
	IV-B		BHR()[101]	PTRP(GMK)[101]			NT (RKB)[104]		PTRP(GMK)[104]	SS (MRM)[104]
	VI-A	AWP (SVK)[104]	E&SD (RRJ)[104]	ITC (BRI)[104], VLSI (NSJ)[106]	CN-A(RKB)[104], CN-B(PSB)[106]		DC(A)[PSB] / MINI PROJECT-2		PIPR (UPP)[106], WD (KSK)	MPMC (KSK)[106], NANO (PPM)[Lab-109]
	VI-B	E&SD (PSB)[106]	AWP (SVK)[106]				DC(PPI)[106]	DC(PPI)[106]		
	VIII-A	IIoT(MRM)		DICD(PPM)	CNS(RRJ)		CVIP(SSG)	UAV(TUM)	BSP(NSJ)	IAC(AAP)
	VIII-B									
TUE	IV-A			NT (SBD)[101]	NT (SBD)[101]	LUNCH	NT(D)[TUM] / SS(A)[GMK] / SEMINAR-II		SS (SLN)[101]	PTRP(GMK)[101]
	IV-B		BHR()[101]	NT(E)[GMK] / SS(F)[MRM] / SEMINAR-II			NT (RKB)[101]	SS (MRM)[101]	NT(F)[RKB] / SS(G)[SM] / SEMINAR-II	
	VI-A	AWP (SVK)[104]	E&SD (RRJ)[104]	ITC (BRI)[104], VLSI (NSJ)[106]	CN-A(RKB)[104], CN-B(PSB)[106]		DC(PPI)[106]	DC(PPI)[106]	PIPR (UPP)[106], WD (KSK)	MPMC (KSK)[106], NANO (PPM)[104]
	VI-B	E&SD (PSB)[106]	AWP (SVK)[106]				DC(D)[AAP] / MINI PROJECT-2			
	VIII-A	UAV(TUM)	IIoT(MRM)	DICD(PPM)	CNS(RRJ)		CVIP(SSG)		BSP(NSJ)	IAC(AAP)
	VIII-B									
WED	IV-A			NT (SBD)[101]	NT (SBD)[101]	LUNCH	NT(C)[UPP] / SS(D)[GMK] / SEMINAR-II		SS (SLN)[101]	PTRP(GMK)[101]
	IV-B		BHR()[101]	NT(G)[UPP] / SS(H)[MRM] / SEMINAR-II			NT (RKB)[101]	SS (MRM)[101]	NT(H)[RKB] / SS(E)[SM] / SEMINAR-II	
	VI-A	AWP (SVK)[104]	E&SD (RRJ)[104]	ITC (BRI)[104], VLSI (NSJ)[106]	CN-A(RKB)[104], CN-B(PSB)[106]		DC(B)[AAP] / MINI PROJECT-2		PIPR (UPP)[106], WD (KSK)	MPMC (KSK)[106], NANO (PPM)[104]
	VI-B	E&SD (PSB)[106]	AWP (SVK)[106]				DC(PPI)[106]	DC(PPI)[106]		
	VIII-A		IIoT(MRM)	DICD(PPM)	CNS(RRJ)		CVIP(SSG)	UAV(TUM)	BSP(NSJ)	IAC(AAP)
	VIII-B									
THU	IV-A		NT(B)[AAJ] / SS(C)[PPI] / SEMINAR-II		PP-B (AAJ)[101], COA (UPP)[Lab-109]	LUNCH	BHR()[101]	PP-A (AAJ)[101], DCE (AAP)[104]	SS (SLN)[101]	PTRP(GMK)[101]
	IV-B			PTRP(GMK)[101]			NT (RKB)[104]		PTRP(GMK)[104]	SS (MRM)[104]
	VI-A	AWP (SVK)[104]		ITC (BRI)[104], VLSI (NSJ)[106]	CN-A(RKB)[104], CN-B(PSB)[106]		DC(PPI)[106]	DC(PPI)[106]	PIPR (UPP)[106], WD (KSK)	MPMC (KSK)[106], NANO (PPM)[Lab-109]
	VI-B		AWP (SVK)[106]				DC(E)[RRJ] / MINI PROJECT-2			
	VIII-A	PROJECT PHASE-II					PROJECT PHASE-II			
	VIII-B									
FRI	IV-A			PP-B (AAJ)[101], COA (UPP)[106]	PP-B (AAJ)[101], COA (UPP)[106]	LUNCH	BHR()[101]	PP-A (AAJ)[101], DCE (AAP)[106]	PP-A (AAJ)[101], DCE (AAP)[106]	
	IV-B									
	VI-A	MPMC(A)[TUM] / ITC(A)[PPM]		MPMC(B)[KSK] / ITC(B)[RRJ] / NANO(A)[PPM]			DC(C)[PPI] / MINI PROJECT-2		MPMC(C)[KSK] / ITC(C)[BRI] / VLSI(A)[SM]	
	VI-B						DC(F)[PSB] / MINI PROJECT-2			
	VIII-A	PROJECT PHASE-II					PROJECT PHASE-II			
	VIII-B									
SAT		MINI PROJECT 2		Placement Oriented Skill Development Sessions			GATE COACHING			DEPARTMENTAL METTING

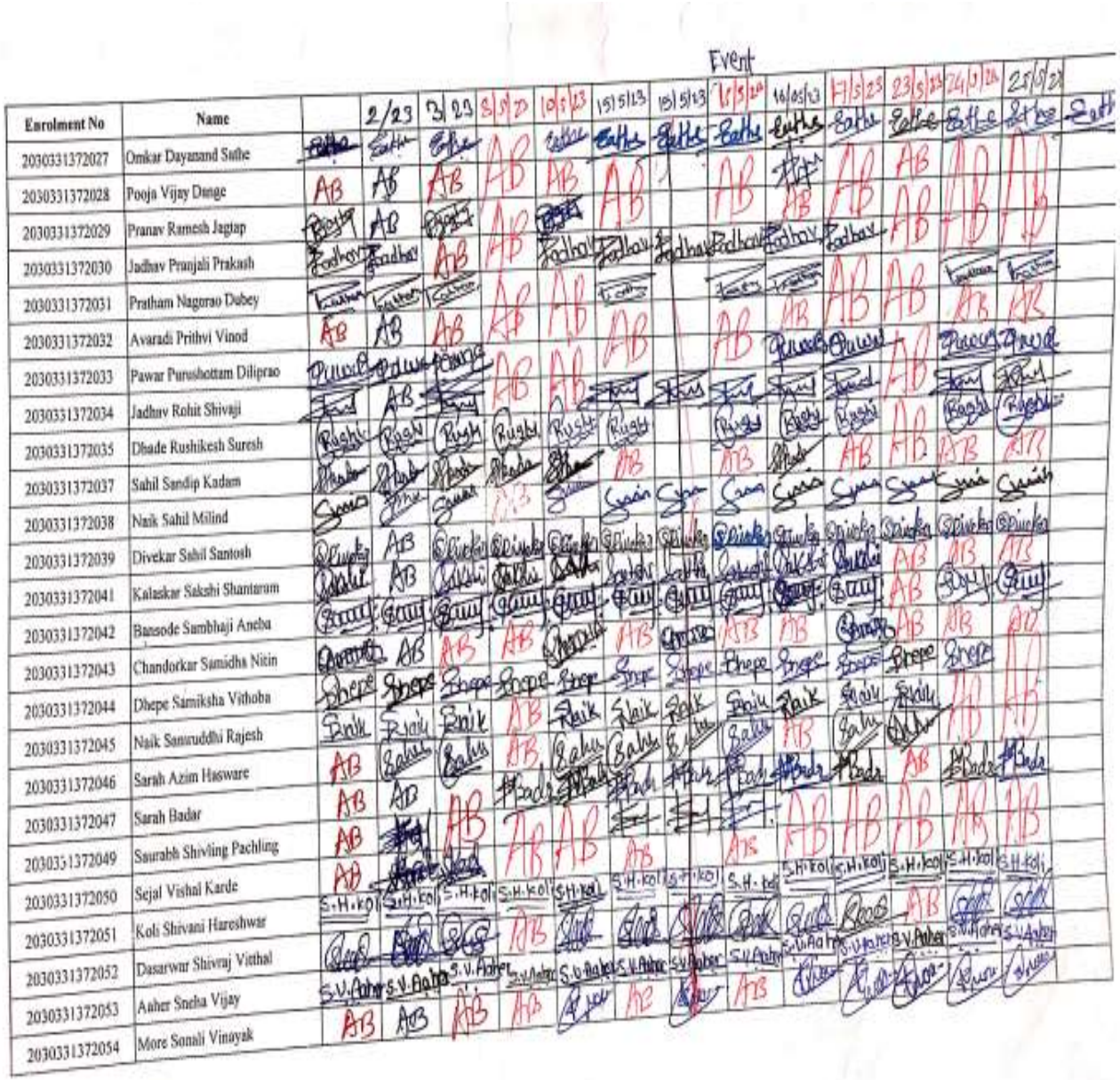
PROFESSOR & HEAD
Prof. S. L. Nalbalwar
Head, Department of Electronics and Telecommunication Engineering
Dr. Babasaheb Ambedkar Technological University
Lonere - Raigad - 402 103

Attendance Sheets



Enrolment No	Name	25/4/23	2/5/23	3/5/23	8/5/23	10/5/23	15/5/23	16/5/23	17/5/23	18/5/23	23/5/23	24/5/23	25/5/23
20303313720001	Jamdar Aakanksha S												
20303313720002	Abhishek Sharma												
20303313720003	Adiya Ranganathan Kadam												
20303313720005	Bade Afzal Azim												
20303313720006	Mohite Anish Ashok												
20303313720007	Bhalerao Ashish Suresh												
20303313720008	Bhosale Balaji Bhausaheb												
20303313720009	Bhagyashri Dinesh Kadvekar												
20303313720010	Surati Chaitanya Dagadu												
20303313720011	Dughrekar Chinmayi Kiran												
20303313720012	Dhepe Dipeshri Dilip												
20303313720013	Chaudhari Himanshu Mohanlal												
20303313720014	Jaimejay Ramakant Dhake												
20303313720015	Ruikar Khushi Vishal												
20303313720016	Mahesh Vijayakumar Kokane												
20303313720017	Raul Manali Milind												
20303313720018	Mhatre Manasvi Anil												
20303313720019	Charat Mayuresh Rajendra												
20303313720020	Patil Meghraj Dilip												
20303313720021	Guru Mohanish Sanjay												
20303313720022	Mandaskar Nikita Babanrao												
20303313720023	Kadam Niraj Anil												
20303313720024	Pawar Om Santer												
20303313720025	Salunke Om Sunil												
20303313720026	Zawire Omkar Harishchandra												

2030331372053	Sneah Shriram Dalvi
2030331372056	Lokhande Srushti Ravi
2030331372058	Shendge Suryaprakash Parmeshwar
2030331372060	Sakrale Tanay Abhijeet



Enrolment No	Name
2030331372027	Omkar Dayanand Sutke
2030331372028	Pooja Vijay Dange
2030331372029	Pranav Ramesh Jagtap
2030331372030	Jadhav Pranjali Prakash
2030331372031	Pratham Nagorao Dubey
2030331372032	Avaradi Prithvi Vinod
2030331372033	Pawar Purushottam Diliprao
2030331372034	Jadhav Rohit Shivaji
2030331372035	Dhade Rushikesh Suresh
2030331372037	Sahil Sandip Kadam
2030331372038	Naik Sahil Milind
2030331372039	Divekar Sahil Santosh
2030331372041	Kalaskar Sakshi Shantaram
2030331372042	Bansode Sambhaji Ancha
2030331372043	Chandorkar Samidha Nitin
2030331372044	Dhepe Samiksha Vithoba
2030331372045	Naik Samruddhi Rajesh
2030331372046	Sarah Azim Hasware
2030331372047	Sarah Badar
2030331372049	Saurabh Shivling Pachling
2030331372050	Sejal Vishal Karde
2030331372051	Koli Shivani Hareshwar
2030331372052	Dasarwar Shivraj Vitthal
2030331372053	Aaher Sneha Vijay
2030331372054	More Sonali Vinayak

Dr. Babasaheb Ambedkar Technological University, Lonere

Semester V	Department of EXTC	Third Year											Div: B			
PRN No.	Name of the Student	25/4/23	2/5/23	3/05	8/5/23	10/5/23	15/5/23	15/5/23	15/5/23	16/5/23						
E2030331372060	TEJAS PRABHAKAR THAKUR	Present	AB	Present		Present	AB		AB	AB						
E2030331372061	TEJAS APPASAHEB KARWAR				AB	AB										
E2030331372062	MORE VAIBHAV GAJANAN		AB	AB	AB	AB										
E2030331372063	VAIBHAV GOROBA HAIGUDE		AB		AB					AB						
E2030331372064	VAISHALI DADARAO SUKHDHANE															
~~E2030331372065~~	~~VALLARI SACHIN SAPATE~~															
E2030331372067	VICKY VISHNU KAPRE				AB	AB				AB						
E2030331372068	VIDHI RAVINDRA POTWAR															
E2030331372069	VINEET VINOD SINGH															
E2030331372070	VINIT VINAYPRATAP SINGH				AB	P			P							
~~E2030331372071~~	~~ATHARVA ARUN KHAMKAR~~															
E2130331372501	SIDDHESH BHANUDAS DANGADE	AB														
E2130331372502	THAMKE NIYATI NATHURAM	AB			AB					AB						
E2130331372503	IPTE RAHUL NARENDRA	Present				AB										
E2130331372504	KULKARNI AMEY PRASHANT															
E2130331372505	KHARVILKAR DIKSHA PUNDLIK	AB		AB												
E2130331372506	SHINDE AISHWARYA SAKHARAM															
E2130331372507	SEJAL NAMDEV KADAM			AB		AB										
E2130331372508	KADAM PRACHI BHARAT			AB						AB						
E2130331372509	SHINDE PRATIK ANANT				AB											
E2130331372510	SATHE AMIT SUDHAKAR															
E2130331372511	NARWADE ROHINI RAJENDRA															
E2130331372512	MORE UPASANA SANJAY				AB											
E2130331372513	ADITYA MANOJ VIBHUTE															
E2130331372514	ZORE POOJA BABAN	AB														
E2130331372515	GAIKWAD KARAN SHATRUGHAN				AB											
E2130331372516	KADVEKAR SHUBHAM SANDESH															

2130331372517	JANSARI RESHANT JEETENDRA
2130331372518	KALE AKASH RAVINDRA
2130331372519	KARKARE SUYOG SUBHASH
2130331372520	GHADGE PRATHAMESH SANTOSH
2130331372521	SHAIKH SHAIKHLAL SIKANDAR
E2130331372522	VISHE SHRADDHA SACHIN
E2130331372523	JANGAM AKSHAT RAJENDRA
E2130331372524	KASREKAR PRANAY GIRISH
E2130331372525	DHAMSHETTI AJINKYA ANIL
E2130331372526	PADWAL ROHIT KISHOR
E2130331372527	SHITOLE ADITYA RAJENDRA
E2130331372528	CHAUDHARI GUNJAN LALIT
E2130331372529	PATIL DIGVIJAY MADHUKAR
E2130331372530	PRATIK PANDURANG LANGOTE
E2130331372531	ABHIJIT NIMBULKAR
E2130331372532	GAIKWAD SAYALI RAVIRAJ
E2130331372533	SHIRKE DHANASHREE UDAY
E2130331372534	PATKE HEMANT SANJAY
E2130331372535	BIRADAR SHRUTI RAMAKANT
E2130331372536	DHULE VRUSHABH ANANTA
E2130331372537	KUTTARMARE AKANKSHA NARAYAN
E2130331372538	SAKHARE YASH RAJESH
E2130331372539	SHINDE MONIKA MAHADEV
E2130331372540	SURVE SAMIR SANTOSH
E2130331372541	AKSHAY SANTOSH DESHMUKH
E2130331372542	SHINDE YASH VINAY

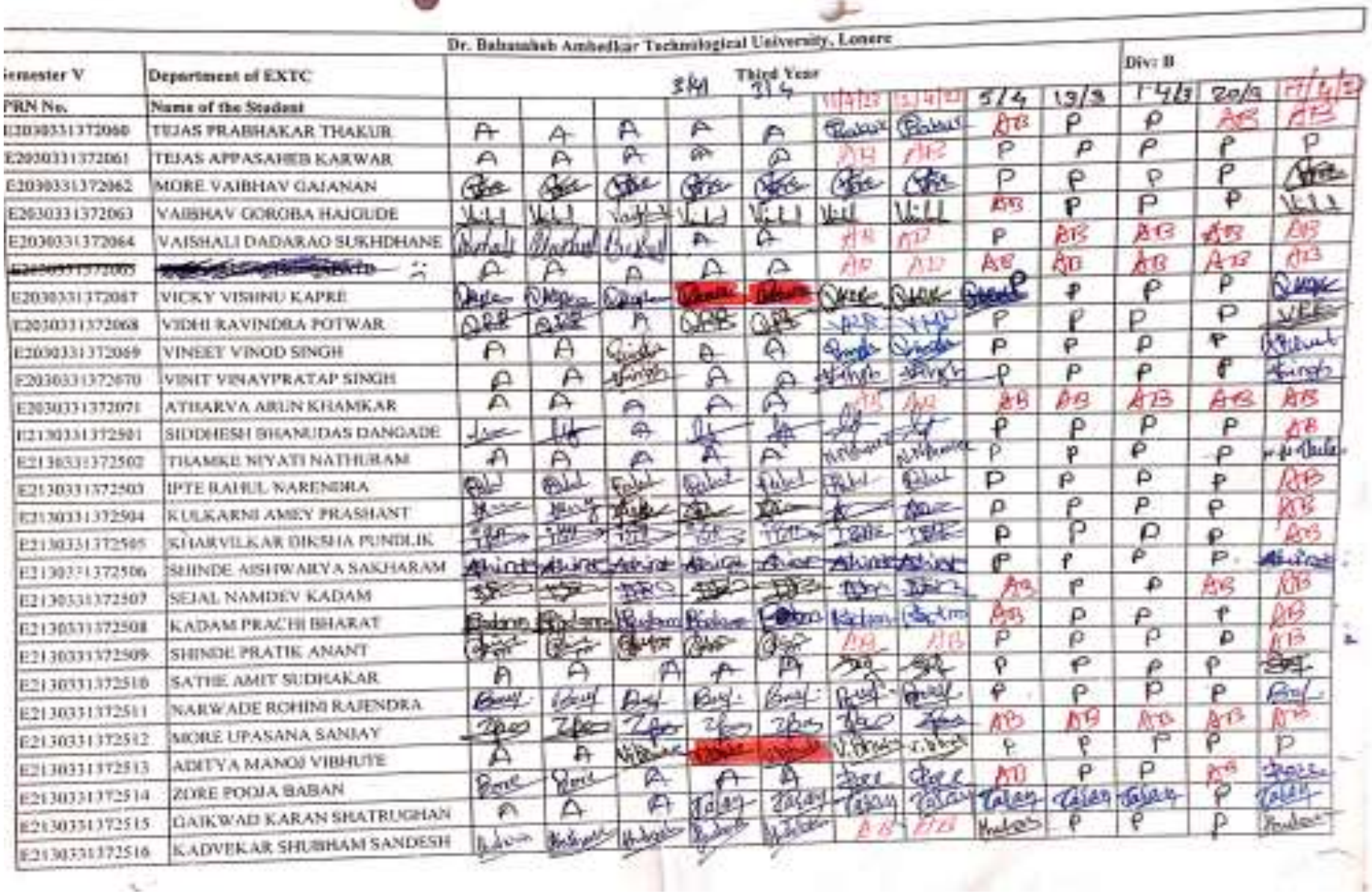
Dr. Babasaheb Aambedkar Technological University, Lonere

Div: A

Department of EXTC   Semester: VI   Sub: ESSD

Enrollment No	Name	13/3/23	14/3/23	15/3/23	20/3/23	03/04/23	5/04/23	10/4/23	11/4/23	12/4/23	17/04/23	17/4/23		
2030331372001	Jamdar Aakanksha S	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]		
2030331372002	Abhishek Sharma	P	P	P	[signature]	[signature]	[signature]	[signature]	[signature]	AB	[signature]	P		
2030331372003	Aditya Ranganathrao Kadam	P	P	P	[signature]	[signature]	AB	AB	AB	P	AB	AB		
2030331372005	Bade Afzal Azim	P	P	AB	AB	[signature]	[signature]	[signature]	[signature]	AP	[signature]	AB		
2030331372006	Mohite Anish Ashok	P	P	P	[signature]	[signature]	AB	AB	AB	AB	[signature]	AB		
2030331372007	Bhakare Ashish Suresh	P	P	AB	[signature]	[signature]	AB	P	AB	[signature]	[signature]	AB		
2030331372008	Bhosale Balaji Bhausaheb	P	P	P	AB	[signature]	AB	AB	[signature]	[signature]	[signature]	[signature]		
2030331372009	Bhagyashri Dinesh Kadvekar	P	P	P	[signature]	[signature]	[signature]	AB	AB	AB	[signature]	[signature]		
2030331372010	Surati Chaitanya Dagadu	AB	AB	P	AB	AB	AB	AB	AB	[signature]	[signature]	[signature]		
2030331372011	Deghrekar Chinmayi Kiran	AB	AB	AB	[signature]	[signature]	[signature]	AB	[signature]	[signature]	[signature]	[signature]		
2030331372012	Dhepe Dipashri Dilip	P	P	AB	[signature]	[signature]	AB	AB	AB	[signature]	[signature]	[signature]		
2030331372013	Chaudhari Himanshu Mohanlal	P	P	P	[signature]	[signature]	[signature]	P	AB	[signature]	[signature]	AB		
2030331372014	Janmejay Ramakant Dhake	P	P	P	[signature]	[signature]	[signature]	AB	AB	[signature]	[signature]	AB		
2030331372015	Raikar Khushi Vishal	P	P	P	[signature]	[signature]	[signature]	AB	AB	AB	[signature]	[signature]		
2030331372016	Mahesh Vijaykumar Kokane	P	P	AB	[signature]	[signature]	[signature]	[signature]	[signature]	AB	[signature]	AB	[signature]	[signature]
2030331372017	Raul Manali Milind	AB	AB	AB	AB	[signature]	AB	[signature]	[signature]	[signature]	[signature]	[signature]		
2030331372018	Mhatre Manasvi Anil	P	P	P	[signature]	AB	AB	AB	[signature]	[signature]	[signature]	[signature]		
2030331372019	Gharat Mayuresh Rajendra	P	P	AB	AB	[signature]	[signature]	AB	[signature]	[signature]	AB	AB		
2030331372020	Patil Meghraj Dilip	AB	AB	P	AB	[signature]	AB	[signature]	[signature]	AB	[signature]	AB		
2030331372021	Guru Mahanish Sanjay	AB	AB	P	[signature]	[signature]	AB	AB	AB	[signature]	[signature]	AB		
2030331372022	Mafdaskar Nikita Babanrao	P	P	P	[signature]	[signature]	AB	[signature]	[signature]	[signature]	[signature]	AB		
2030331372023	Kadam Niraj Anil	AB	AB	AP	AP	AB	AB	AB	AP	AB	AB	AB		
2030331372024	Pawar Om Sameer	P	P	AB	[signature]	[signature]	[signature]	[signature]	[signature]	AB	[signature]	AB	[signature]	
2030331372025	Salunke Om Sunil	P	P	P	AB	[signature]	[signature]	AB	[signature]	[signature]	[signature]	AB		
2030331372026	Zaware Omkar Harishchandra	AB	AB	AB	[signature]	[signature]	[signature]	[signature]	[signature]	AB	[signature]	AB		

Enrolment No	Name	13/03	14/03	16/03	20/3	3/4/23	5/4/23	11/4/23	12/4/23	17/4/23	17/4/23
2030331372027	Omkar Dayanand Sathe	P	P	AB					AB		AB
2030331372028	Pooja Vijay Dange	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
2030331372029	Pranav Ramesh Jagtap	P	P	P	AB		AB	P			
2030331372030	Jadhav Pranjali Prakash	P	P	P							
2030331372031	Pritham Nigoriso Dubey	AB	AB	AB							
2030331372032	Avanali Prithvi Vinod	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
2030331372033	Pawar Purushottam Diliprao	P	P	P		AB	AB	P	AB	AB	AB
2030331372034	Jadhav Rohit Shivaji	P	P	P			AB				
2030331372035	Dhade Rushikesh Suresh	P	P	P		AB	AB				
2030331372037	Sahil Sandip Kadam	AB	AB	P	AB					AB	AB
2030331372038	Naik Sahil Milind	AB	AB	P	AB			AB			
2030331372039	Divekar Sahil Santosh	P	P	P	AB			AB	AB	AB	AB
2030331372041	Kalaskar Sakshi Shantaram	AB	AB	AB							
2030331372042	Borsode Sambhaji Ancha	AB	AB	AB		AB	AB	P			
2030331372043	Chandorkar Samidha Nitin	P	P	P	AB			AB			
2030331372044	Dhepe Samiksha Vithoba	P	P	P							
2030331372045	Naik Samruddhi Rajesh	P	P	P	AB			P			
2030331372046	Sarib Azim Haravare	P	P	P			AB				
2030331372047	Sarub Badar	P	P	AB	AB				AB		
2030331372049	Saurabh Shivling Pushling	AB	AB				AB	AB			
2030331372050	Sejal Vitthal Kardc	AB	AB	AB	AB	AB	AB	P	AB		
2030331372051	Koli Shivani Harcalwar	AB	AB	P	AB						
2030331372052	Dasarwar Shivraj Vitthal	P	P	AB	AB				AB		
2030331372053	Asher Sneha Vijay	P	P	P							
2030331372054	More Sonali Vinayak	P	P	P			AB	AB	AB		
2030331372055	Sonali Shriram Dalvi	P	P	P		AB	AB				
2030331372056	Lokhande Snehal Raja	P	P	P				AB			
2030331372058	Shendge Satyaprakash Parmeshwar	P	P	P			AB	AB			
2030331372059	Salunke Yuvay Abhijeet	AB	AB	AB		AB	AB	AB	AB	AB	AB



Dr. Babasaheb Ambedkar Technological University, Lonere

Semester V	Department of EXTC	Third Year											Div: B			
		S/M				T/H										
PRN No.	Name of the Student								5/4	13/3	1'4/3	20/3				
E2030331372060	TEJAS PRABHAKAR THAKUR	A	A	A	A	A	P	P	AB	P	P	AB	AB			
E2030331372061	TEJAS APPASAHEB KARWAR	A	A	A	A	A	AB	AB	P	P	P	P	P			
E2030331372062	MORE VAIBHAV GAJANAN	P	P	P	P	P	P	P	P	P	P	P	P			
E2030331372063	VAIBHAV GOROBA HAIGUDE	P	P	P	P	P	P	P	AB	P	P	P	P			
E2030331372064	VAISHALI DADARAO SUKHDHANE	P	P	P	A	A	AB	AB	P	AB	AB	AB	AB			
[redacted]	[redacted]	A	A	A	A	A	AB	AB	AB	AB	AB	AB	AB			
E2030331372067	VICKY VISHNU KAPRE	P	P	P	[redacted]	[redacted]	P	P	P	P	P	P	P			
E2030331372068	VIDHI RAVINDRA POTWAR	P	P	A	P	P	AB	AB	P	P	P	P	P			
E2030331372069	VINEET VINOD SINGH	A	A	P	A	A	P	P	P	P	P	P	P			
E2030331372070	VINIT VINAYPRATAP SINGH	A	A	P	A	A	P	P	P	P	P	P	P			
E2030331372071	ATHARVA ARUN KHAMKAR	A	A	A	A	A	AB	AB	AB	AB	AB	AB	AB			
E2130331372501	SIDDHESH DHANUDAS DANGADE	P	P	A	P	P	P	P	P	P	P	P	AB			
E2130331372502	THAMKE NIYATI NATHURAM	A	A	A	A	A	P	P	P	P	P	P	P			
E2130331372503	IPTE RAHUL NARENDRA	P	P	P	P	P	P	P	P	P	P	P	AB			
E2130331372504	KULKARNI AMEY PRASHANT	P	P	P	P	P	P	P	P	P	P	P	AB			
E2130331372505	KHARVILKAR DIKSHA PUNDLIK	P	P	P	P	P	P	P	P	P	P	P	AB			
E2130331372506	SHINDE AISHWARYA SAKHARAM	P	P	P	P	P	P	P	P	P	P	P	P			
E2130331372507	SEJAL NAMDEV KADAM	P	P	P	P	P	P	P	AB	P	P	AB	AB			
E2130331372508	KADAM PRACHI BHARAT	P	P	P	P	P	P	P	AB	P	P	P	AB			
E2130331372509	SHINDE PRATIK ANANT	P	P	P	P	P	AB	AB	P	P	P	P	AB			
E2130331372510	SATHE AMIT SUDHAKAR	A	A	A	A	A	P	P	P	P	P	P	P			
E2130331372511	NARWADE ROHINI RAJENDRA	P	P	P	P	P	P	P	P	P	P	P	P			
E2130331372512	MORE UPASANA SANJAY	P	P	P	P	P	P	P	AB	AB	AB	AB	AB			
E2130331372513	ADITYA MANOJ VIBHUTE	A	A	P	[redacted]	[redacted]	P	P	P	P	P	P	P			
E2130331372514	ZORE POOJA BABAN	P	P	A	A	A	P	P	AB	P	P	AB	P			
E2130331372515	GAIKWAD KARAN SHATRUGHAN	A	A	A	P	P	P	P	Taken	Taken	Taken	P	Taken			
E2130331372516	KADVEKAR SHUBHAM SANDESH	P	P	P	P	P	AB	AB	Taken	P	P	P	Taken			

E2130331372517	JANSARI RESHANT JEETENDRA	A	A	A					P	P	P	P		
E2130331372518	KALE AKASH RAVINDRA			A	A	A			P	P	P	P		
E2130331372519	KARKARE SUYOG SUBHASH			A	A	A	ATB	ATB	ATB	P	P	P		
E2130331372520	GHADGE PRATHAMESH SANTOSH	A	A						ATB	P	P	ATB		
E2130331372521	SHAIKH SHAIKHLAL SIKANDAR			A	A	A	ATB	ATB	ATB	ATB	ATB	ATB		
E2130331372522	VISHE SHRADDHA SACHIN	A	A	A					ATB	P	P	P		
E2130331372523	JANGAM AKSHAT RAJENDRA			A	A	A				P	P			
E2130331372524	KASREKAR PRANAY GIRISH			A			P	ATB		P	P			
E2130331372525	DHAMSHETTI AJINKYA ANIL									P	P	P		
E2130331372526	PADWAL ROHIT KISHOR				A	A	ATB	ATB	ATB	P	P	P		
E2130331372527	SHITOLE ADITYA RAJENDRA									P	P	P		
E2130331372528	CHAUDHARI GUNJAN LALIT	A	A	A					P	P	P	P		
E2130331372529	PATIL DIGVIJAY MADHUKAR	A	A	A	A	A	ATB	ATB	ATB	ATB	ATB	ATB	ATB	
E2130331372530	PRATIK PANDURANG LANGOTE	A	A	A	A	A			P	P	P	P		
E2130331372531	ABHIJIT NIMBULKAR						ATB	ATB	P	P	P	P		
E2130331372532	GAIKWAD SAYALI RAVIRAJ	A	A	A					ATB	P	P	P		
E2130331372533	SHIRKE DHANASHREE UDAY								P	P	P	P	ATB	
E2130331372534	PATKE HEMANT SANJAY								ATB	P	P	P		
E2130331372535	BIRADAR SHRUTI RAMAKANT								P	P	P	P	ATB	
E2130331372536	DHULE VRUSHABH ANANTA													
E2130331372537	KUTTARMARE AKANKSHA NARAYAN	A	A	A							P	P		
E2130331372538	SAKHARE YASH RAJESH													
E2130331372539	SHINDE MONIKA MAHADEV			A					P	P	P	P		
E2130331372540	SURVE SAMIR SANTOSH		A	A		A	ATB	ATB	ATB	ATB	ATB	ATB	ATB	
E2130331372541	AKSHAY SANTOSH DESHMUKH		A	A					ATB	ATB	ATB	ATB		
E2130331372542	SHINDE YASH VINAY	A	A		A	A			ATB	ATB	ATB	ATB		
E2130331372543	VIRAG SHANKER TEMBHE	A	A		A	A			P	P	P	P		

Assessment of Course Outcomes through Mid-Semester

PRN NO.	Name	Q1 (CO1) 5 Marks	Q2 (CO2) 5 Marks	Q3(CO3)5 Marks	Q4(CO4)5 Marks	Total Marks /20 Mid Sem
2030331372001	Jamdar Aakanksha S	5	5	5	5	20
2030331372002	Abhishek Sharma	5	5	5	5	20
2030331372003	Aditya Ranganathrao Kadam	5	5	5	5	20
2030331372005	Bade Afzal Azim	5	5	5	5	20
2030331372006	Mohite Anish Ashok	5	5	5	5	20
2030331372007	Bhalerao Ashish Suresh	5	5	5	5	20
2030331372008	Bhosale Balaji Bhausaheb	4	0	5	4	13
2030331372009	Bhagyashri Dinesh Kadvekar	3	5	5	4	17
2030331372010	Surati Chaitanya Dagadu	5	5	5	2	17
2030331372011	Dughrekar Chinmayi Kiran	5	5	5	5	20
2030331372012	Dhepe Dipeshri Dilip	5	5	5	5	20
2030331372013	Chaudhari Himanshu Mohanlal	5	5	5	5	20
2030331372014	Janmejay Ramakant Dhake	5	5	5	5	20
2030331372015	Ruikar Khushi Vishal	5	5	5	5	20
2030331372016	Mahesh Vijayakumar Kokane	3	5	5	2	15
2030331372017	Raul Manali Milind	5	5	5	5	20
2030331372018	Mhatre Manasvi Anil	4	4	5	4	17
2030331372019	Gharat Mayuresh Rajendra	5	5	3	3	16
2030331372020	Patil Meghraj Dilip	5	5	5	5	20
2030331372021	Guru Mohanish Sanjay	5	5	5	5	20
2030331372022	Mardaskar Nikita Babanrao	5	5	5	5	20
2030331372023	Kadam Niraj Anil	5	5	5	5	20
2030331372024	Pawar Om Sameer	3	5	5	4	17
2030331372025	Salunke Om Sunil	5	5	4	5	19
2030331372026	Zaware Omkar Harishchandra	5	5	5	3	18
2030331372027	Omkar Dayanand Sathe	5	5	4	5	19
2030331372028	Pooja Vijay Dange	5	5	5	3	18
2030331372029	Pranav Ramesh Jagtap	5	5	5	5	20

2030331372030	Jadhav Pranjali Prakash	5	5	5	5	20
2030331372031	Pratham Nagorao Dubey	5	5	5	5	20
2030331372033	Pawar Purushottam Diliprao	5	0	5	5	15
2030331372034	Jadhav Rohit Shivaji	3	0	5	1	9
2030331372035	Dhade Rushikesh Suresh	5	5	5	5	20
2030331372037	Sahil Sandip Kadam	5	5	5	5	20
2030331372038	Naik Sahil Milind	5	5	5	5	20
2030331372039	Divekar Sahil Santosh	5	5	5	5	20
2030331372041	Kalaskar Sakshi Shantaram	5	5	5	5	20
2030331372042	Bansode Sambhaji Aneba	5	5	5	5	20
2030331372043	Chandorkar Samidha Nitin	5	5	5	5	20
2030331372044	Dhepe Samiksha Vithoba	5	5	5	5	20
2030331372045	Naik Samruddhi Rajesh	5	5	5	5	20
2030331372046	Sarah Azim Hasware	5	5	5	5	20
2030331372047	Sarah Badar	5	5	5	4	19
2030331372049	Saurabh Shivling Pachling	5	0	5	2	12
2030331372050	Sejal Vishal Karde	5	5	0	0	10
2030331372051	Koli Shivani Hareshwar	5	5	5	5	20
2030331372052	Dasarwar Shivraj Vitthal	5	5	5	1	16
2030331372053	Aaher Sneha Vijay	5	0	5	5	15
2030331372054	More Sonali Vinayak	5	5	5	5	20
2030331372055	Sonali Shivram Dalvi	5	5	5	5	20
2030331372056	Lokhande Srushti Raju	5	5	5	5	20
2030331372058	Shendge Suryaprakash Parmeshwar	5	5	5	5	20
2030331372059	Salunke Tanay Abhijeet	5	5	5	5	20

E2030331372060	TEJAS PRABHAKAR THAKUR	4	5	5	0	14
E2030331372061	TEJAS APPASAHEB KARWAR	4	3	4	5	16
E2030331372062	MORE VAIBHAV GAJANAN	5	0	5	5	15
E2030331372063	VAIBHAV GOROBA HAJGUDE	1	5	5	5	16
E2030331372064	VAISHALI DADARAO SUKHDHANE	5	5	5	5	20
E2030331372067	VICKY VISHNU KAPRE	5	5	5	5	20
E2030331372068	VIDHI RAVINDRA POTWAR	5	5	5	5	20
E2030331372069	VINEET VINOD SINGH	5	5	5	5	20
E2030331372070	VINIT VINAYPRATAP SINGH	5	5	5	5	20
E2130331372501	SIDDHESH BHANUDAS DANGADE	5	5	5	5	20
E2130331372502	THAMKE NIYATI NATHURAM	0	0	0	0	0
E2130331372503	IPTE RAHUL NARENDRA	5	5	5	5	20
E2130331372504	KULKARNI AMEY PRASHANT	3	5	3	5	16
E2130331372505	KHARVILKAR DIKSHA PUNDLIK	5	5	5	5	20
E2130331372506	SHINDE AISHWARYA SAKHARAM	5	5	5	5	20
E2130331372507	SEJAL NAMDEV KADAM	5	5	5	1	16
E2130331372508	KADAM PRACHI BHARAT	5	5	5	5	20
E2130331372509	SHINDE PRATIK ANANT	5	5	5	5	20
E2130331372510	SATHE AMIT SUDHAKAR	5	5	5	1	16
E2130331372511	NARWADE ROHINI RAJENDRA	4	5	5	5	19
E2130331372512	MORE UPASANA SANJAY	5	5	5	1	16
E2130331372513	ADITYA MANOJ VIBHUTE	5	5	5	5	20
E2130331372514	ZORE POOJA BABAN	5	0	3	5	13
E2130331372515	GAIKWAD KARAN SHATRUGHAN	0	5	2	0	7
E2130331372516	KADVEKAR SHUBHAM SANDESH	4	5	0	4	13
E2130331372517	JANSARI RESHANT JEETENDRA	5	5	4	4	18
E2130331372518	KALE AKASH RAVINDRA	4	5	4	1	14
E2130331372519	KARKARE SUYOG SUBHASH	5	5	5	4	19

E2130331372520	GHADGE PRATHAMESH SANTOSH	5	5	3	5	18
E2130331372521	SHAIKH SHAIKHLAL SIKANDAR	5	5	5	5	20
E2130331372522	VISHE SHRADDHA SACHIN	5	5	5	5	20
E2130331372523	JANGAM AKSHAT RAJENDRA	5	5	3	5	18
E2130331372524	KASREKAR PRANAY GIRISH	3	5	3	5	16
E2130331372525	DHAMSHETTI AJINKYA ANIL	5	5	5	5	20
E2130331372526	PADWAL ROHIT KISHOR	5	5	4	5	19
E2130331372527	SHITOLE ADITYA RAJENDRA	5	5	5	5	20
E2130331372528	CHAUDHARI GUNJAN LALIT	5	4	5	5	19
E2130331372529	PATIL DIGVIJAY MADHUKAR	5	4	5	5	19
E2130331372530	PRATIK PANDURANG LANGOTE	0	0	0	0	0
E2130331372531	ABHIJIT NIMBULKAR	5	5	5	5	20
E2130331372532	GAIKWAD SAYALI RAVIRAJ	5	5	5	5	20
E2130331372533	SHIRKE DHANASHREE UDAY	5	5	5	5	20
E2130331372534	PATKE HEMANT SANJAY	5	5	4	5	19
E2130331372535	BIRADAR SHRUTI RAMAKANT	5	4	5	5	19
E2130331372536	DHULE VRUSHABH ANANTA	5	5	5	5	20
E2130331372537	KUTTARMARE AKANKSHA NARAYAN	5	5	5	5	20
E2130331372538	SAKHARE YASH RAJESH	5	5	5	5	20
E2130331372539	SHINDE MONIKA MAHADEV	5	5	5	5	20
E2130331372540	SURVE SAMIR SANTOSH	5	1	3	2	11
E2130331372541	AKSHAY SANTOSH DESHMUKH	5	5	5	4	19
E2130331372542	SHINDE YASH VINAY	1	5	0	0	6
10303320181137210137	VIRAJ TEMBHE	5	5	5	5	20

ASSIGNMENTS

Assignment 1:

1. What are soft skills, explain with an example.
2. What are hard skills, explain with an example.
3. Explain Soft Skills to master
4. Explain Interdisciplinary relevance
5. Explain Global and national perspectives on soft skills
6. What is resume? [Summary]
7. What is Curriculum Vitae (CV)? [Course of Life]
8. Explain difference between Resume and CV
9. How to develop an impressive resume?
10. Explain different formats of Resume?
11. Explain difference between Job application and Cover letter.
12. Write a Cover letter for B.Tech passed out fresher student in Electronics and Telecommunication
13. Explain PROFESSIONAL PRESENTATION PLANNING
14. EXPLAIN TECHNICAL WRITING

Assignment 2:

1. What is Interpersonal Skills?
2. Write Short Notes on:

- Critical Thinking,
- Assertiveness,
- Decision Making,
- Problem Solving,
- Negotiation,
- Building Confidence,
- Time Management

3. Explain Professional etiquettes and manners

Assignment 3:

1. What is Interview and types of interviews?
2. Explain Preparatory steps for job interview
3. Explain Interview skill tips
4. Explain Problem solving model

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE-402103

Department of Electronics and Telecommunication Engineering

Mid Term Examination April 2022-23

Class: B. Tech (Third Year) **Semester: VI**

Subject: EMPLOYABILITY AND SKILL DEVELOPMENT (BTHM605)

Date: 21 / 4 / 2023 **Total Marks: 20** **Time: 1 hr.**

ALL QUESTIONS CARRY EQUAL MARKS

Q. 1	What are soft skills, explain any five soft skills with an example.	(05)
Q. 2	Write a Cover letter applying for an internship position.	(05)
Q. 3	**Solve any one (A or B)** **A)** Explain difference between Resume and CV B) Explain different formats of Resume?	(05)
Q.4	**Solve any one (A or B)** **A)** What is Interpersonal Skills, explain any five with an example. **B)** Explain Global and national perspectives on soft skills	(05)

---------- ***ALL THE BEST*** ----------

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech. **Branch :EXTC** **Semester :VI**

Subject Code & Name: BTHM606 Employability & Skill Development

Max Marks: 60 **Date: 28/07/2023** **Duration: 3 Hrs.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	What are soft skills, explain any five with an example.	CO1, CO2	**6**
B)	Explain Professional Etiquette and Manners.	CO1, CO2	**6**
C)	Write a Project Update EMAIL: Share an update on the progress of a Mini project with your respective guide. [Don't mention your personal information in it]	CO1, CO2	**6**
Q.2	**Solve Any Two of the following.**		
A)	What are Interpersonal Skills, explain any five with an example	CO 4	**6**
B)	Write a Cover letter for B.Tech passed out fresher student applying for a Job. [Don't mention your personal information in it]	CO 4	**6**
C)	What are the key differences between a resume and a curriculum vitae (CV)?	CO 4	**6**
Q. 3	**Solve Any Two of the following.**		
A)	Explain Global and national perspectives on soft skills.	CO 2	**6**
B)	Explain how to develop an impressive Resume.	CO 4	**6**

C)	What are the virtues of listening and what are the fundamentals of good listening?	CO 4	**6**

Q.4 Solve Any Two of the following.

A)	Write a short story in 200 – 250 words, with the help of the cues given below. Give a suitable title and write the moral of the story.	CO3	**6**

Rahul, a young boy .....dreams of becoming a successful businessman..... Inspired by a local entrepreneur success story.....Rahul starts small ventures to support his family.....With his friend Amit's support..... Rahul studies business strategies.....learns from successful entrepreneurs..... A business competition with a scholarship.....turning point……Despite challenges..... He wins the scholarship..... Rahul's success inspires his community.....brings positive changes..... His story proves.....no dream is too big to achieve.

B)	Mention Interview skill tips that would assist the candidate in a successful interview.	CO2	**6**
C)	State and explain the problem-solving model steps in detail.	CO3	**6**

Q. 5 Solve Any Two of the following.

A)	Write a short note on 1) Critical thinking 2) Assertiveness 3) Time Management.	CO3	**6**
B)	How to effectively plan, prepare, and deliver a professional presentation?	CO3	**6**
C)	Difference between group discussion vs Panel discussion vs Debate?	CO3	**6**

****** ALL THE BEST ******

Assessment of Course Outcomes

Course Outcomes	Assessment Tool	Contribution to Programme outcomes in %					Attainment level of course outcomes (%)		Achievement (Goal: 70%) In Yes/No
		PO1	PO2	PO4	PO5	PO6			
CO1	MSE Q 1	46	46	46	46	46	46	89.09%	Yes
	MSE Q 3	52	52	52	52	52	81		
	MSE Q 4	94	94	94	94	94	94		
	Assignment1	80	80	80	80	80	80		
	Assignment2	100	100	100	100	100	100		
	Assignment3	91	91	91	91	91	91		
CO2	MSE Q 2	45	45	45	45	45	60		
	Assignment1	96	96	96	96	96	96		
	Assignment2	100	100	100	100	100	100		
	Assignment3	92	92	92	92	92	92		
	Assignment4	96	96	96	96	96	96		

Department of Electronics and Telecommunication Engineering

COURSE FILE

Analog Integrated Circuit Design (BTETPE704B)

Fourth Year (VIIth SEM)

Subject Teacher: Prashant Prabhakar Mahajan

Academic Year: 2022-2023

INDEX

SYLLABUS

UNIT - 1

Introduction to Simulations

Introduction to Advanced Design System and Cadence Virtuoso, DC Simulations, AC Simulations, Harmonic Balance, Envelope Simulation, Electromagnetic Simulations- FEM, MOM, FDTD, Circuit Net listing.

UNIT - 2

MOSFET Device Physics & Modeling

MOSFET Structure, Threshold Voltage, Drain Current Equation, Transfer & Output Characteristics, Weak/Moderate/Strong Inversion, Linear/Triode/Saturation Region of Operation, Device Leakages and Losses, Short Channel Effects, High Frequency Small Signal Model of MOSFET, Cubic, BSIM and Materka Models of MOSFET.

UNIT - 3

Few Transistor Circuits

Current Mirrors, Common Source/Common Gate/Common Drain Amplifiers, Design and Analysis of CS/CG/CD Amplifiers, Cascode Amplifiers, Differential Gain Stage, Frequency

---

Response & Design Trade-offs, Telescopic Cascode and Wide Swing Cascode Current Mirrors, PTAT, CTAT & Bandgap Bias Circuits.

UNIT - 4

Operational Amplifiers & OTAs

Design of Classical Op-Amps, Op-Amp Characteristics, Analysis and Trade-offs, Wideband Op-Amps, High Speed Op-Amps, Very High Gain Op-Amps, Operational Transconductance Amplifiers, Ultra Low Power OTAs for Medical Implants, Folded Cascode Op-Amps.

UNIT - 5

Biasing Schemes

Voltage and Current References, Vt reference bias, PTAT Current Reference, CTAT and Bandgap Voltage References, High Precision Voltage References, Voltage Level Shifters.

UNIT - 6

Non-Linear Circuits

Single and Balanced Diode Mixers, Translinear Cell, Gilbert Cell Mixers, Power Amplifiers, Even & Odd Order Mixing, In-Modulation (AM, PM Conversions) Distortions, Intermodulation Distortions, Intermodulation Products, ACPR & EVM.

TEXT/REFERENCE BOOKS

1. Tony Chan Carusone, David A. Johns, Kenneth W. Martin, "Analog Integrated Circuit Design," John Wiley & Sons Keliu Shu, Edgar Sanchez-Sinencio, "CMOS PLL Synthesizers," Springer
2. Jose Carlos Pedro, Nuno Borges Carvalho, "Intermodulation Distortion in Microwave and Wireless Circuits," Artech House Stephen A. Maas, "Microwave Mixers," Artech House.

Course Objectives

Introduction to Circuit Simulation & EM Simulations.

1. Deep Understanding of MOS Device Physics & Modeling.
2. Understanding of few transistor circuits like common gate, common source & common drain amplifiers with their frequency response.
3. Understanding of Operational Amplifier Design & Trade-offs.
4. Advanced Op-Amps and OTAs.
5. Temperature Compensated Biasing Schemes.

Course Outcomes

After successfully completing the course students will be able to

1. Describe the models for active devices in MOS and Bipolar IC technologies.
2. Describe layout considerations for active and passive devices in analog ICs.
3. Analyze and design IC current sources and voltage references.
4. Describe the noise sources and models applicable to ICs.
5. Understand and appreciate the importance of noise and distortion in analog circuits.
6. Analyze integrated circuit noise performance.
7. Analyze and design IC operational amplifiers.

Program Outcomes

1. The graduates will possess the knowledge of differential equations, vector calculus, complex variable, matrix theory, probability theory, physics, chemistry, and electrical & electronics engineering
2. The graduate will demonstrate an ability to identify, formulate and solve Electronics & Telecommunication engineering problems
3. The graduates will have an ability to design electronic circuits and systems, analyze and interpret data.
4. The graduates will have an ability to design digital and analog systems and components
5. The graduates will possess the knowledge of advanced and emerging topics in the fields of

Electronics, Signal Processing and Communication

6. The graduates will demonstrate the skills to use modern engineering tools, software and equipment's to analyze and solve real-life problems
7. The graduate will have broad understanding of the impact of Electronics and Telecommunication field in economic, environmental, and social context and will be aware of the contemporary issues
8. The graduates will possess communication skills necessary to communicate engineering ideas. The skills set include verbal, written and listening skills.
9. The graduates will demonstrate the ability to work and collaborate in heterogeneous teams.
10. The graduates will demonstrate the awareness of professional and ethical responsibilities
11. The graduates will develop self-confidence and ability for lifelong learning.

Course Outcomes and Program Outcomes Mapping Table

Course Outcomes	Program Outcomes										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	High	Low	Medium	Medium	High	Low	-	-	-	Medium
CO2	-	High	Medium	High	High	High	Low	-	-	-	Low

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे

Dr. Babasaheb Ambedkar Technological University, Lonere

(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel: (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Dated:12/ 08/2022

Academic Calendar 2022-23 (Odd Semester) (Engineering)

Sl. No.	Activity	Commencement Date	Concluding Date	Total Days	Engineering
1	Admissions: B.Tech. Second, Third and Final Year; M.Tech. Second year.	September 01, 2022	September 10, 2022	10	UG and PG
2	Commencement of Classes of Second, Third and Final Year	September 01, 2022	December 19, 2022	110	UG and PG
3	Dissertation Examination of the Academic Year 2021-2022	September 01, 2022	September 10, 2022	10	PG
4	Mid-Semester Examinations	October 12, 2022	October 21, 2022	09	UG and PG
5	Submission of Dissertation Proposal to University	October 18, 2022	October 21, 2022	04	PG
6	Display of Mid-Semester Examination Marks	October 28, 2022	October 31, 2022	04	UG and PG
7	Scrutiny of Master's Level Dissertation Work Proposal	November 01, 2022	November 03, 2022	03	PG
8	Exam Form Filling for Regular & Supplementary Examinations	November 01, 2022	November 08, 2022	08	UG and PG
9	Exam Form Filling for Regular & Supplementary Examinations with Late Fee	November 09, 2022	November 15, 2022	07	UG and PG
10	University Tech Fest 2021	November 17, 2022	November 19, 2022	03	UG and PG
11	End of Classes	--	December 19, 2022	110	UG and PG
12	Practical/Project/Seminar Examinations	December 20, 2022	December 23, 2022	04	UG and PG
13	Uploading Internal, Mid Semester, Practical, Project and Seminar marks on University portal	December 22, 2022	December 24, 2022	03	UG and PG
14	End Semester Regular & Supplementary Examination	December 26, 2022	January 21, 2023	26	UG and PG
15	Internship/Industrial Training#				
16	Vacation	January 1, 2023	January 20, 2023	20	Faculty and Staff

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel: (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Date: 12/08/2022

17	Commencement of Classes	February 1, 2023	May 31, 2022	120	UG and PG
18	Remedial Examination	February 21, 2023	March 3,2023	10	UG and PG

#Industrial training will be carried out after completion of odd semester or in the staggered manner in the period of entire odd semester (Preferably on Saturdays, Sundays and Holidays) and partially in the vacation after odd semester. Another option could be permit the training in online mode which is not less than 120 hours.

Table 2 : List of Festivals / Holidays

Sl. No.	Festivals / Holidays	Date
1	Dasara	Wednesday, 05 October, 2022
2	Diwali Laxmi Pujan	Monday, 24 October, 2022
3	Diwali Balipratipada	Wednesday, 26 October, 2022
4	Guru Nanak Jayanti	Tuesday, 08 November, 2022

Table 3 : Following Holidays fall on Sunday

Sl. No.	Festivals / Holidays	Date
1	Mahatma Gandhi Jayanti	02 October, 2022
2	Id-E-Milad	09 October, 2022
3	Christmas	25 December, 2022

12.08.2022

(Dr. B. F. Jogi)
Registrar

Dr. Babasaheb Ambedkar Technological University, Lonere

Department of Electronics and telecommunication Engineering

Subject: Analog Integrated Circuit Design **Subject Code**: **BTETPE704B**
Class: Third Year **Semester:** VII
Pre-requisite: EDC, Digital Electronics, Analog Circuits **Faculty:** Mr. Prashant P Mahajan

Marking Scheme

CA1, CA2 = 10 Marks Mid-Sem = 20 marks End Sem Paper- 60 marks

Lesson Plan

UNIT NO.	CHAPTER NAME	LECT NO.	TOPICS
I	MOS Basics	1	Review of MOS transistor models
		2	NMOS, PMOS characteristics
		3	Transistor as switch
		4	Non-ideal behavior of MOS transistor
		5	Threshold Voltage, Channel Length Modulation
		6	Velocity saturation, Subthreshold leakage
		7	Transistor working in linear, saturation, cutoff
		8	High frequency Model of MOSFET
II	Few Transistor circuits	9	Working of basic MOS current mirror
		10	Cascode current Mirror and its output resistance
		11	Common Source amplifier
		12	Common Gate amplifier
		13	Common drain amplifier
		14,15	Telescopic Cascode amplifier
		16,17	Frequency response of CS, CD amplifiers with active load.
		18	Wide Swing Cascode current mirror
		19	PTAT, CTAT and bandgap bias circuit
III	Operational amplifiers & OTAs	20	Design of classical OP-Amps
		21	OP-amp Characteristics, analysis, and Trade-off
		22	Wide band OP-amps
		23	High speed, very high gain op-amps
		24	Operational Transconductance Amplifier (OTA)
IV	Biasing Schemes	25	Static power dissipation
		26	Voltage and current references
		27	PTAT current reference
		28	CTAT bandgap voltage references
		29	High precision voltage references
V	Non-linear circuits	30	Single and balanced diode mixers
		31	Trans linear cell
		32	Gilbert Cell mixers

		33	Power Amplifiers
		34	Even and odd order mixing
VI	**Introduction to simulations**	35	Introduction to Cadence software
		36	DC simulations
		37	AC simulations
		38	Electromagnetic simulations
		39	FEM, MOM
		40	Circuit net listing

Dr. Babasaheb Ambedkar Technological University, Lonere

TIME-TABLE

Department of Electronics & Telecommunication Engineering

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.
Department of Electronics & Telecommunication Engineering
W.E.F. March 2022

		09:00-10:00	10:00-11:00	11:00-12:00	12:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00
MON	III-A		EM-III[104]	DE(NSJ)[104]		LUNCH	EDC(JSK)[106]		DE[A](KSK)/EDC[B](RKB)	
	III-B		DE(PSB)[106]		EM-III[104]		EMI(UPP)[104]		EDC(PSB)[104]	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	CSE(RKB)[101]		DSP[A](PPI)/ACOMM[B](TUM)			
	V-B	DSP[D](SSG)/ACOMM[E](AAJ)		ACOMM(AAJ)[106]	DSP(SSG)[106]		DSD(KSK)[101]		EMFT(AAJ)[101]	
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]		MTT[A](UPP)/FOC[A](JSK)/WSN[A](SM)				AIDL(SSG)[101], VLSI(NSJ)[106], DCE(AAP)[104]	DC(PPI)[106]	AICD(PPM)[101], ESC(MRM)[106]
	VII-B									
TUE	III-A	DE[C](TUM)/EDC[D](PSB)		DE(NSJ)[104]		LUNCH	EDC(JSK)[104]	EMI(UPP)[104]	EM-III[104]	
	III-B		EMI(UPP)[104]		EM-III[104]		DE(PSB)[101]		DE[E](KSK)/EDC[F](AAJ)	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]			DSD(KSK)[101]	DSP[C](AAP)/ACOMM(A)[TUM]	
	V-B	DSP[F](PPI)/ACOMM(D)[MRM]		ACOMM(AAJ)[106]	DSD(KSK)[106]		EMFT(AAJ)[106]	DSP(SSG)[106]		
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]	DCE(AAP)[104]	MTT[B](SM)/FOC[B](JSK)/WSN[B](RKB)			MECH[A](PPM)			AIDL(SSG)[101], VLSI(NSJ)[106]
	VII-B								DC(PPI)[106]	
WED	III-A	DE[B](PPI)/EDC[C](RKB)		DE(NSJ)[104]	EDC(JSK)[104]	LUNCH			EMI(UPP)[104]	
	III-B		EDC(PSB)[106]		EM-III[106]		EMI(UPP)[104]		DE[G](PPI)/EDC[H](AAJ)	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]		DSP[B](AAP)/ACOMM[C](MRM)			
	V-B	DSP[E](SSG)/ACOMM[F](KSK)		ACOMM(AAJ)[106]			CSE(RKB)[101]		DSD(KSK)[101]	DSP(SSG)[104]
	VII-A	MTT(SVK)[101], WSN(BRI)[106], FOC(JSK)[104]	DCE(AAP)[104]	AIDL[A](SSG)/VLSI[A](PSB)/DCE[A](AAP)				AIDL(SSG)[101], VLSI(NSJ)[106]	FM(AAP)[106]	AICD(PPM)[101], ESC(MRM)[106]
	VII-B						DC(PPI)[106]			
THU	III-A			DE(NSJ)[104]		LUNCH	DE[D](UPP)/EDC[A](JSK)			
	III-B	DE[F](TUM)/EDC[G](JSK)			EM-III[104]			EDC(PSB)[106]	DE(PSB)[106]	
	V-A		DSP(SLN)[101]	EMFT(SBD)[101]	ACOMM(MRM)[101]			DSD(KSK)[101]	CSE(RKB)[101]	
	V-B			ACOMM(AAJ)[106]			EMFT(AAJ)[104]	CSE(RKB)[104]	DSD(KSK)[104]	DSP(SSG)[104]
	VII-A	MECH(PPM)[101]	DC(PPI)[106]	AIDL[B](SSG)/VLSI[B](SM)/DCE[B](AAP)			FM(AAP)[106]	MECH[B](PPM)		AICD(PPM)[101], ESC(MRM)[106]
	VII-B		FM(AAP)[104]				DC(PPI)[101]			
FRI	III-A		EM-III[104[	EM-III[104]	EDC(JSK)[104]	LUNCH		EMI(UPP)[104]	EMI(UPP)[104]	
	III-B	DE[H](UPP)/EDC[E](PSB)			EMI(UPP)[101]		EDC(PSB)[106]	DE(PSB)[106]		
	V-A			DSD(KSK)[101]			ACOMM(MRM)[101]	DSD(KSK)[101]	CSE(RKB)[101]	CSE(RKB)[101]
	V-B			CSE(RKB)[106]	CSE(RKB)[106]		EMFT(AAJ)[104]			
	VII-A		DC(PPI)[106]	AICD[A](PPM)/ESC(A)[MRM]			AICD[B](PPM)/ESC[B](SM)		MECH(PPM)[104]	MECH(PPM)[104]
	VII-B		FM(AAP)[101]							
SAT	VII-A			GATE COACHING			GATE COACHING			DEPARTMENTAL METTING
	VII-B									

Prof. S. L. Nalbalwar
Head, Department of Electronics and Telecommunication Engineering

Dr. Babasaheb Ambedkar Technological University, Lonere

Question Bank AY 2022-23

Assignment 1

DATE OF DISPLAY: 10/10/2022

Analog Integrated Circuit Design (AICD)

Semester VII

Assignment No. 1

Q1. Explain working of nMOSFET in three regions i.e., accumulation/weak/strong inversion

Q2. Draw & explain MOSFET VI characteristics in detail and explain working of MOSFET in cutoff, triode and saturation region.

Q3. Explain following Short Channel Effects (SCE's) in MOSFET

1. Hot carrier effect
2. Mobility Degradation
3. Tunneling
4. DIBL
5. Punch through

Q4. Draw low frequency and high frequency small signal model for MOSFET.

Q5. Draw basic current mirror circuit and find its output impedance.

Q6. Draw Common Source amplifier with active load and derive the expression for gain.

Q7. Draw Common Gate amplifier with active load and derive the expression for gain.

Q8. Draw Common Drain amplifier with active load and derive the expression for gain.

Q9. Draw and explain Cascode amplifier with active load and derive expression for gain.

Q10. Draw the MOS differential pair with active load and derive gain expression.

LAST DATE OF SUBMISSION: 17/10/2022

NOTE:

- No marks will be awarded for assignments which are submitted after 17/10/2022
- Assignment 1 should be submitted in OFFLINE mode only
- All questions should be solved in good hand writing.
- All questions should be solved on pages and not in any notebooks.
- This assignment is not question bank for mid semester exam.

Assignment 2

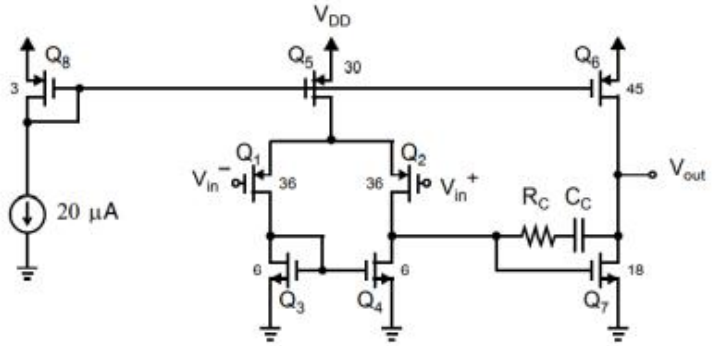
Date of Display: 7/12/2022

Assignment 2

Analog Integrated Circuit Design (AICD)

Q1) Draw the block diagram of two stage OPAMP and explain each stage in detail.

Q2) Calculate Gain for two stage CMOS OPAMP with purely capacitive load shown below.



Assume power supply of VDD=1.8V, assume process parameters of 0.18μm CMOS technology.

Q3) Draw the second order small signal model for two stage CMOS OPAMP and obtain expression for unity gain frequency (ω_{ta})

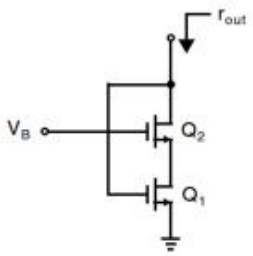
Q4) What is Slew Rate (SR) of OPAMP. Obtain expression for SR for CMOS OP-AMP.

Q5) Explain the role of compensating capacitor Cc on two stage CMOS OPAMP.

Q6) Explain wide swing current mirrors in detail.

Q7) Draw the circuit diagram of folded Cascode op-amp and derive the gain expression.

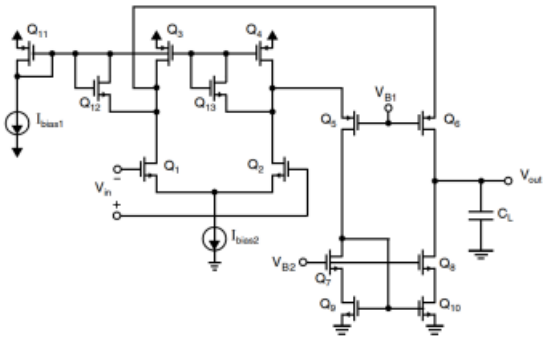
Q8) Calculate output impedance of two transistor diode connected circuit shown below using small signal analysis, assume both transistors in saturation region, ignore body effect.



Q9) An Operational Transconductance Amplifier (OTA) has G_{ma}=5 mA/V and DC gain of 45 dB. What is its output impedance r_{out}

Date of Display: 7/12/2022

Q10) For the folded Cascode OPAMP shown

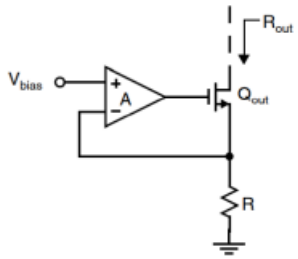


(Please refer transistor sizes Table 6.1 Carusone book)

$I_{bias1} = 20\mu A$ and $C_L = 10pF$ find Unity Gain Frequency and Slew Rate (SR)

Q11) Write a short note on Common Mode Feedback Circuit (CMFB)

Q12) For the circuit shown below using small signal analysis find the output impedance. Approximate this value for large value of A.



Last Date of Submission: 14/12/2022

NOTES:

1) Kindly submit assignment within due date. (OFFLINE MODE ONLY)
2) Assignments submitted late will be given least marks.
3) If a student is not able to submit assignment due to medical or other reasons, still will be reduced accordingly.

CA1 & CA2 Evaluation Criteria

Test →	CA1	CA2
Criteria ↓	Marks allocated for assignments	
Assignment1	10	---
Assignment2	--	10

a. ** Correct answering of tricky questions answered during regular classes is also considered for CA1 and CA2 evaluation. Those who answered questions correctly are considered for 1 or 2 extra marks in addition to the marks obtained after assignment completion.

Question Papers AY 2021-22

DR BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Department of Electronics and Telecommunication Engineering

Mid Semester Examination- October 2022

Subject: Analog Integrated Circuit Design **Subject Code: BTETPE704B**

Semester: VII **Date: 31/10/2022**

Max Marks: 20 **Duration: 1 Hour**

NOTE: 1. Answer any FOUR questions out of the following

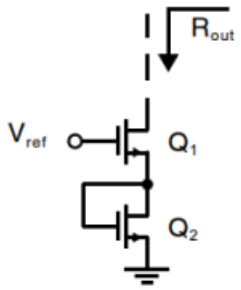
2. Each question carries FIVE marks

Q 1) Draw nMOS VI characteristics and explain working in Cutoff, Linear and Saturation region

Q 2) Explain 'Hot carrier effect' in MOSFET

Q 3) Draw the basic current mirror circuit and obtain expression for output impedance.

Q 4) Derive the output impedance of circuit shown below. Ignore body effect.



Q 5) For a common source amplifier with an active load derive equation of low frequency small signal voltage gain.

***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination – 2022

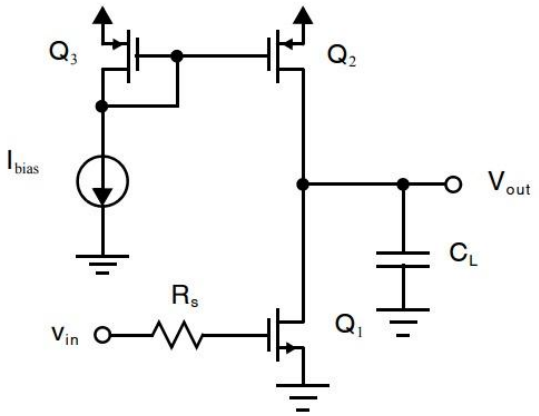
Course: B. Tech. **Branch: E&TC** **Semester: VII**

Subject Code & Name: BTETPE704B & Analog Integrated Circuit Design

Max Marks: 60 **Date:7/02/2023** **Duration: 2:00 To 5:00 PM**

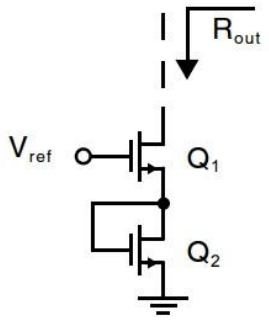
Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		Level/(CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**Draw two stage CMOS OP-AMP amplifier. Considering low frequency response, obtain gain expression.**	**1/7**	**6**
B)	**What are the advantages & drawbacks of a Cascode current mirror?**	**1/3**	**6**
C)	**Write a short note on band gap voltage references**	**1/3**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	 **Perform a zero-value time constant analysis for the circuit shown above to obtain expression for -3dB frequency.**	**2/1**	**6**
B)	**For circuit shown in Q.2 A), assume all transistors have $\frac{W}{L} = \frac{100\mu m}{1.6\mu m}$** **Take $I_{bias} = 100\ \mu A, R_S = 180\ K\Omega, C_L = 0.3\ pF, C_{gs1} = 0.2\ pF, C_{gd1} = 0.015\ pF, C_{db1} = 20\ fF, C_{gd2} = 22fF, C_{db2} = 36\ fF$** **Estimate: -3dB frequency.** **(Use $0.8\ \mu m$ CMOS technology, parameters are given below** $\mu_p C_{OX} = 30\ \mu A/V^2\ \mu_n C_{OX} = 92\ \mu A/V^2\ (\lambda L)_n = 0.12\ \mu m/V$	**2/1**	**6**

$(\lambda L)_p = 0.08\ \mu m/V \quad V_{tn} = 0.8\ V\ V_{tp} = -0.90\ V$)

C) Derive output resistance of the circuit shown below. Ignore body effect. 1/5 6



Q. 3 Solve Any Two of the following. 12

A) Draw the telescopic Cascode amplifier & obtain the expression for low frequency gain. 1/5 6

B) For common source amplifier with active load assume I_{bias}=100 µA, all transistors have W/L= 10 µm/0.4 µm and use device parameters are those of 0.35 µm CMOS process. What is overall gain? 2/1 6

(For 0.35 µm CMOS process, $\mu_p C_{OX} = 55\ \mu A/V^2$ $\mu_n C_{OX} = 190\ \mu A/V^2$ $(\lambda L)_n = 0.16\ \mu m/V$ $(\lambda L)_p = 0.16\ \mu m/V$)

C) Explain following short channel effects in MOSFET 1/1 6

1. Punch Through
2. Hot Carrier Effect

Q.4 Solve Any Two of the following. 12

A) Draw and explain V-I characteristics of both pMOS and nMOS. Which one is better? 2/1 6

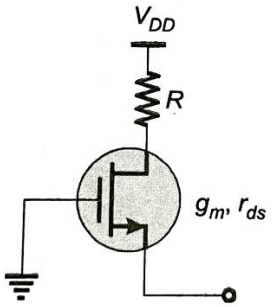
B) What is Slew Rate of OP-AMP. Obtain expression for Slew Rate of CMOS OPAMP 1/7 6

C) How Millers theorem is used to obtain -3dB frequency of a common source amplifier with active load 2/3 6

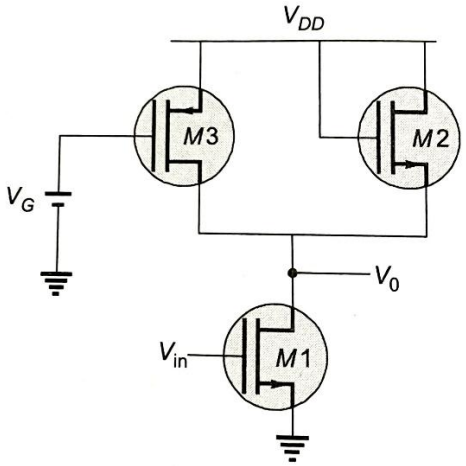
Q. 5 Solve Any Two of the following. 12

A) Explain the effect of Body on threshold voltage and drain current of MOSFET 1/1 6

B) Using low frequency small signal model of MOS device, the equivalent resistance seen is 2/5 6



C) **In the circuit shown in figure, the channel length modulation of all transistors of all transistors is non-zero. Also, transistors operate in saturation and have negligible body effect. The ac small signal voltage gain (V_0/V_{in})** **2/5** **6**



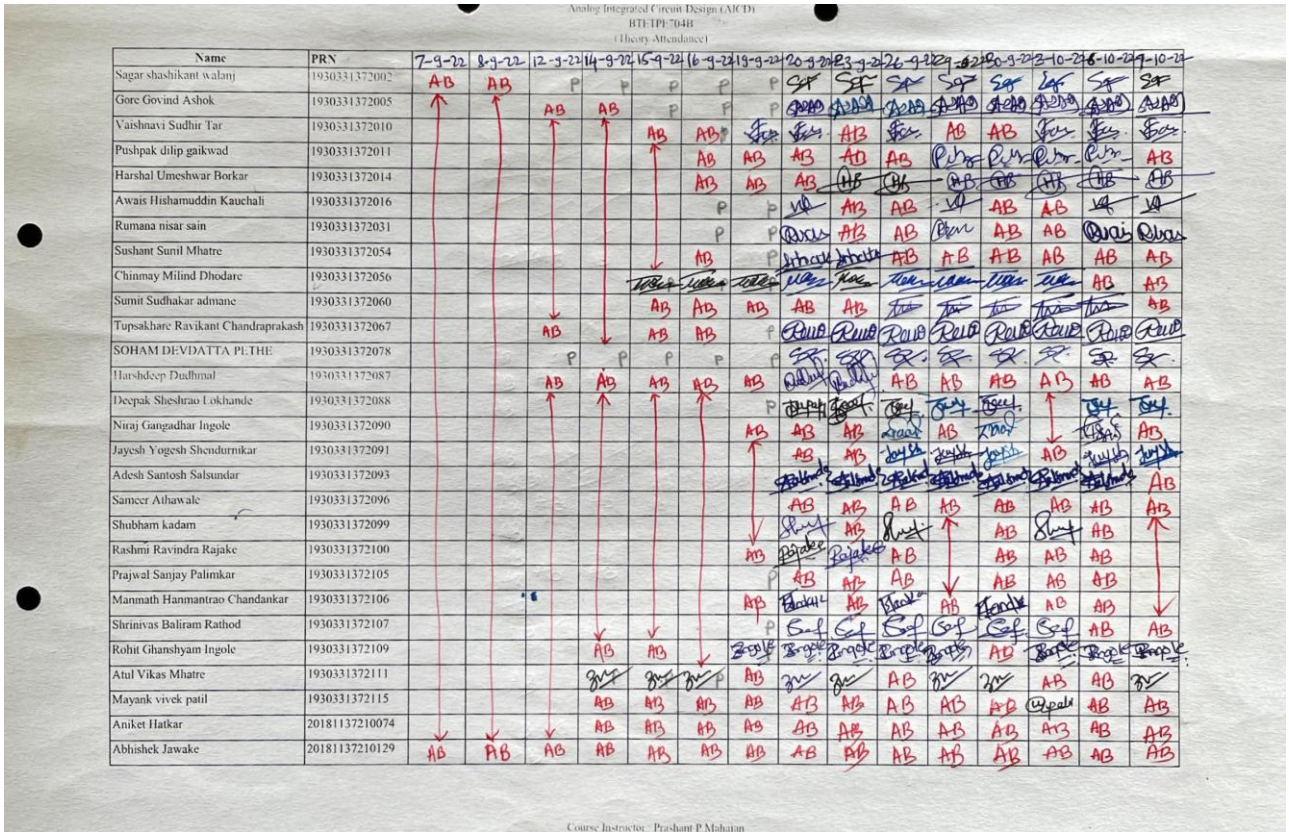
***** End *****

Dr. Babasaheb Ambedkar Technological University, Lonere

Student Attendance

Dept. Electronics & Telecommunication Engineering

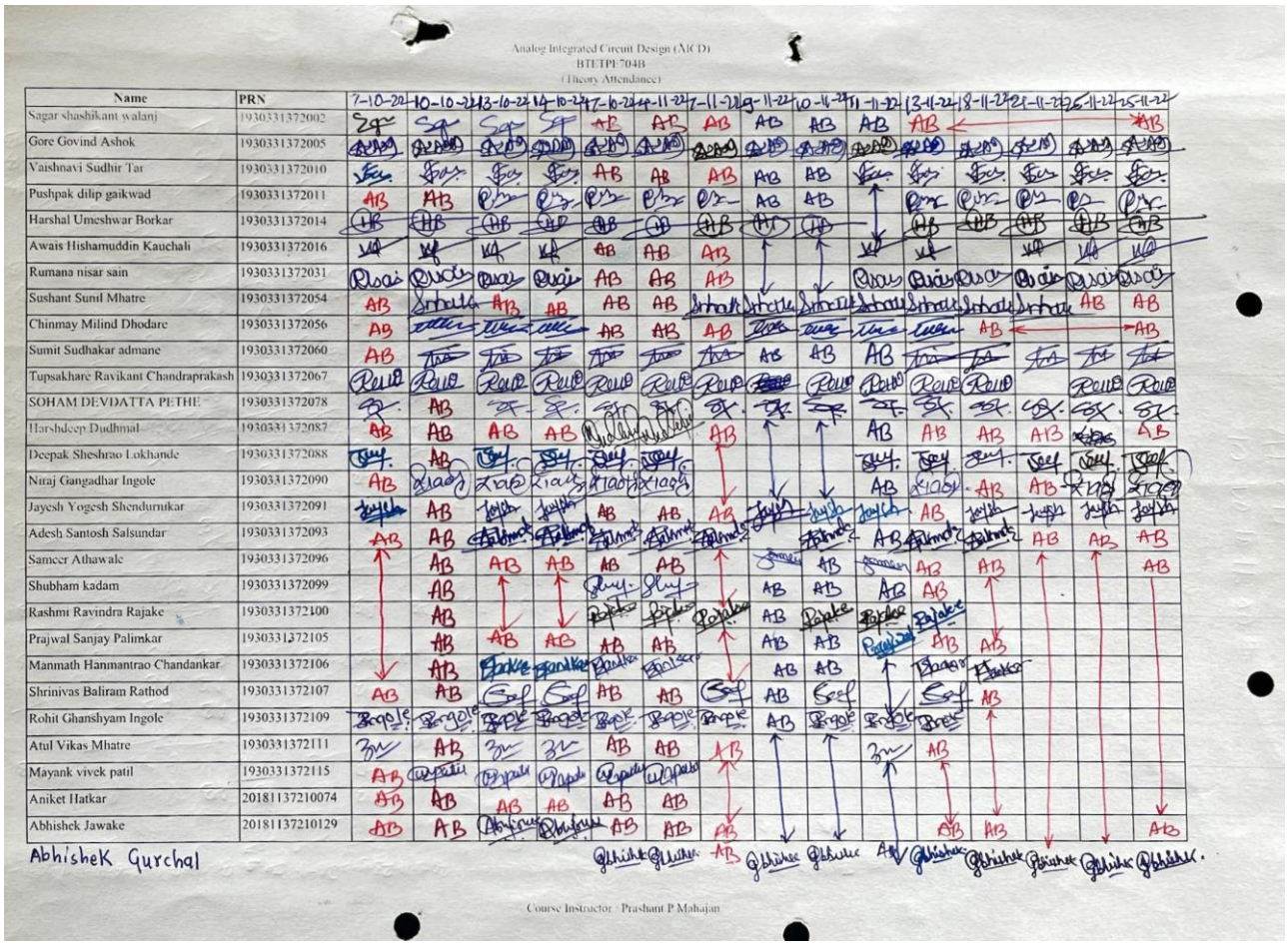
Dr. Babasaheb Ambedkar Technological University, Lonere



Analog Integrated Circuit Design (AICD)
BTETPE704B
(Theory Attendance)

Name	PRN	7-9-22	8-9-22	12-9-22	14-9-22	15-9-22	16-9-22	19-9-22	20-9-22	23-9-22	26-9-22	29-9-22	30-9-22	3-10-22	6-10-22	9-10-22
Sagar shashikant walanj	1930331372002	AB	AB	P	P	P	P	P	Sgr	Sgr	Sgr	Sgr	Sgr	Sgr	Sgr	Sgr
Gore Govind Ashok	1930331372005			AB	AB	P	P	P								
Vaishnavi Sudhir Tar	1930331372010					AB	AB			AB	AB	AB				
Pushpak dilip gaikwad	1930331372011						AB	AB	AB	AB	AB					AB
Harshal Umeshwar Borkar	1930331372014						AB	AB	AB							
Awais Hishamuddin Kauchali	1930331372016						P	P		AB	AB		AB	AB		
Rumana nisar sain	1930331372031						P	P		AB	AB		AB	AB		
Sushant Sunil Mhatre	1930331372054						AB	P		AB	AB	AB	AB	AB	AB	AB
Chinmay Milind Dhodare	1930331372056														AB	AB
Sumit Sudhakar admane	1930331372060					AB	AB	AB	AB	AB						AB
Tupsakhare Ravikant Chandraprakash	1930331372067			AB		AB	AB									
SOHAM DEVDATTA PETHE	1930331372078			P	P	P	P									
Harshdeep Dudhmal	1930331372087			AB	AB	AB	AB	AB		AB	AB	AB	AB	AB	AB	AB
Deepak Sheshrao Lokhande	1930331372088								P							
Niraj Gangadhar Ingole	1930331372090								AB	AB		AB				AB
Jayesh Yogesh Shendurnikar	1930331372091								AB	AB			AB			
Adesh Santosh Salsundar	1930331372093															AB
Sameer Athawale	1930331372096								AB	AB	AB	AB	AB	AB	AB	AB
Shubham kadam	1930331372099									AB			AB		AB	
Rashmi Ravindra Rajake	1930331372100								AB		AB		AB	AB	AB	
Prajwal Sanjay Palimkar	1930331372105								P	AB	AB		AB	AB	AB	
Manmath Hanmantrao Chandankar	1930331372106								AB	AB		AB		AB	AB	
Shrinivas Baliram Rathod	1930331372107								P					AB	AB	
Rohit Ghanshyam Ingole	1930331372109				AB	AB										
Atul Vikas Mhatre	1930331372111						P	AB		AB			AB	AB		
Mayank vivek patil	1930331372115				AB	AB	AB	AB	AB	AB	AB	AB		AB	AB	
Aniket Hatkar	20181137210074				AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	
Abhishek Jawake	20181137210129	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	

Course Instructor : Prashant P.Mahajan



Analog Integrated Circuit Design (AICD)
BTETPE704B
(Theory Attendance)

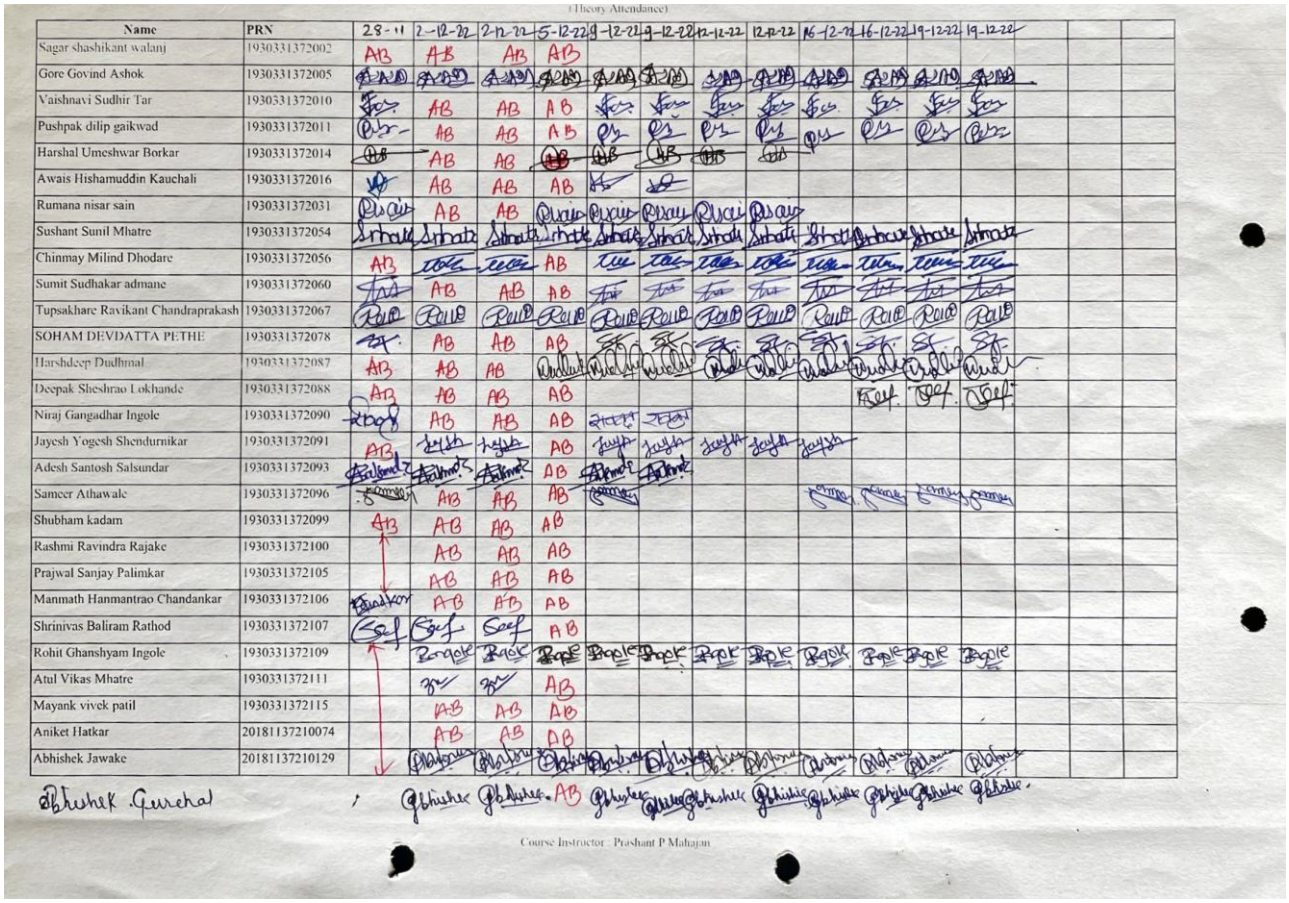
Name	PRN	7-10-22	10-10-22	13-10-22	14-10-22	17-10-22	24-10-22	7-11-22	9-11-22	10-11-22	11-11-22	13-11-22	18-11-22	21-11-22	25-11-22
Sagar shashikant walanj	1930331372002	Sgr	Sgr	Sgr	Sgr	AB	AB	AB	AB	AB	AB	AB			AB
Gore Govind Ashok	1930331372005														
Vaishnavi Sudhir Tar	1930331372010					AB	AB	AB	AB	AB					
Pushpak dilip gaikwad	1930331372011	AB	AB						AB	AB					
Harshal Umeshwar Borkar	1930331372014					AB	AB	AB							
Awais Hishamuddin Kauchali	1930331372016					AB	AB	AB							
Rumana nisar sain	1930331372031					AB	AB	AB							
Sushant Sunil Mhatre	1930331372054	AB		AB	AB	AB	AB							AB	AB
Chinmay Milind Dhodare	1930331372056	AB				AB	AB	AB						AB	AB
Sumit Sudhakar admane	1930331372060	AB							AB	AB	AB				
Tupsakhare Ravikant Chandraprakash	1930331372067														
SOHAM DEVDATTA PETHE	1930331372078		AB												
Harshdeep Dudhmal	1930331372087	AB	AB	AB	AB			AB			AB	AB	AB	AB	AB
Deepak Sheshrao Lokhande	1930331372088		AB												
Niraj Gangadhar Ingole	1930331372090	AB									AB		AB	AB	
Jayesh Yogesh Shendurnikar	1930331372091		AB			AB	AB	AB				AB			
Adesh Santosh Salsundar	1930331372093	AB	AB								AB		AB	AB	AB
Sameer Athawale	1930331372096		AB	AB	AB	AB	AB			AB	AB	AB			AB
Shubham kadam	1930331372099		AB						AB	AB	AB				
Rashmi Ravindra Rajake	1930331372100		AB						AB						
Prajwal Sanjay Palimkar	1930331372105		AB	AB	AB	AB	AB		AB	AB	AB				
Manmath Hanmantrao Chandankar	1930331372106		AB						AB	AB					
Shrinivas Baliram Rathod	1930331372107	AB	AB			AB	AB		AB						
Rohit Ghanshyam Ingole	1930331372109								AB						
Atul Vikas Mhatre	1930331372111		AB			AB	AB	AB				AB			
Mayank vivek patil	1930331372115	AB													
Aniket Hatkar	20181137210074	AB	AB	AB	AB	AB	AB								
Abhishek Jawake	20181137210129	AB	AB			AB	AB	AB				AB	AB		AB

Abhishek Gurchal

Course Instructor : Prashant P.Mahajan

Dept. Electronics & Telecommunication Engineering

Dr. Babasaheb Ambedkar Technological University, Lonere



(Theory Attendance)

Name	PRN	28-11	2-12-22	2-12-22	5-12-22	9-12-22	9-12-22	12-12-22	12-12-22	16-12-22	16-12-22	19-12-22	19-12-22
Sagar shashikant walanj	1930331372002	AB	AB	AB	AB								
Gore Govind Ashok	1930331372005												
Vaishnavi Sudhir Tar	1930331372010		AB	AB	AB								
Pushpak dilip gaikwad	1930331372011		AB	AB	AB								
Harshal Umeshwar Borkar	1930331372014		AB	AB									
Awais Hishamuddin Kauchali	1930331372016		AB	AB	AB								
Rumana nisar sain	1930331372031		AB	AB									
Sushant Sunil Mhatre	1930331372054												
Chinmay Milind Dhodare	1930331372056	AB			AB								
Sumit Sudhakar admane	1930331372060		AB	AB	AB								
Tupsakhare Ravikant Chandraprakash	1930331372067												
SOHAM DEVDATTA PETHE	1930331372078		AB	AB	AB								
Harshdeep Dudhmal	1930331372087	AB	AB	AB									
Deepak Sheshrao Lokhande	1930331372088	AB	AB	AB	AB								
Niraj Gangadhar Ingole	1930331372090		AB	AB	AB								
Jayesh Yogesh Shendurnikar	1930331372091	AB			AB								
Adesh Santosh Salsundar	1930331372093				AB								
Sameer Athawale	1930331372096		AB	AB	AB								
Shubham kadam	1930331372099	AB	AB	AB	AB								
Rashmi Ravindra Rajake	1930331372100		AB	AB	AB								
Prajwal Sanjay Palimkar	1930331372105		AB	AB	AB								
Manmath Hanmantrao Chandankar	1930331372106		AB	AB	AB								
Shrinivas Baliram Rathod	1930331372107				AB								
Rohit Ghanshyam Ingole	1930331372109												
Atul Vikas Mhatre	1930331372111				AB								
Mayank vivek patil	1930331372115		AB	AB	AB								
Aniket Hatkar	20181137210074		AB	AB	AB								
Abhishek Jawake	20181137210129												

Abhishek Gurchal

Course Instructor : Prashant P Mahajan

Dept. Electronics & Telecommunication Engineering

Student Performance

Sr NO	ROLL NO	Mid Sem marks (20)	CA-1 (10)	CA-2 (10)	Total (40)
1	20150338	0	10	10	20
2	1930331372060	10	10	10	30
3	20181137210129	0	10	10	20
4	20181137210074	10	10	10	30
5	1930331372115	10	10	10	30
6	1930331372005	19	10	10	39
7	1930331372010	08	10	10	28
8	1930331372011	01	10	10	21
9	1930331372014	11	10	10	31
10	1930331372016	06	10	10	26
11	1930331372031	07	10	10	27
12	1930331372054	09	10	10	29
13	1930331372056	04	10	10	24
14	1930331372067	11	10	10	31
15	1930331372078	14	10	10	34
16	1930331372087	00	10	10	20
17	1930331372088	04	10	10	24
18	1930331372090	05	10	10	25
19	1930331372091	07	10	10	27
20	1930331372093	15	10	10	35
21	1930331372096	03	10	10	23
22	1930331372099	00	10	10	20
23	1930331372100	01	10	10	21
24	1930331372105	00	10	10	20
25	1930331372106	00	10	10	20
26	1930331372107	01	10	10	21
27	1930331372109	03	10	10	23
28	1930331372111	07	10	10	27

Assessment of Course Outcomes through MSE

MSE Question numbers	Q.1/5	Q.2/5	Q.3/5	Q.4/5	Q.5/5
Relevant Course Outcomes	CO1	CO2	CO3	CO4	CO5
20150338	0	0	NA	NA	0
1930331372060	4	0	3	NA	03
20181137210129	0	0	0	0	0
20181137210074	3	NA	3	NA	4
1930331372115	4	NA	4	NA	2
1930331372005	5	NA	5	5	4
1930331372010	0	0	4	4	NA
1930331372011	0	0	0	0	1
1930331372014	1	NA	4	2	4
1930331372016	0	NA	2	1	3
1930331372031	1	NA	3	4	1
1930331372054	2	NA	5	NA	2
1930331372056	1	1	1	NA	1
1930331372067	3	1	4	1	2
1930331372078	3	1	5	0	5
1930331372087	0	NA	0	NA	NA
1930331372088	2	0	NA	NA	2
1930331372090	0	0	1	NA	4
1930331372091	0	2	NA	1	0
1930331372093	1	2	5	2	5
1930331372096	NA	NA	1	NA	2
1930331372099	NA	NA	0	NA	NA
1930331372100	0	0	1	NA	0
1930331372105	0	0	0	NA	NA
1930331372106	NA	0	NA	0	0
1930331372107	0	NA	0	NA	1
1930331372109	0	0	1	NA	2
1930331372111	2	NA	5	NA	NA
Average	1.28	0.4375	2.375	1.667	2.086
Percentage	25.6	8.75	47.5	33.34	41.72

*NA = Not Attempted

Assessment of Course Outcomes through Assignments

Assignment No	Relevant Course Outcomes	Number of Students Completed Assignments	Total Number of Students	Percentage
1	CO1, CO2, CO3	28	28	100
2	CO4, CO5, CO6	28	28	100

Assessment of Course Outcomes

Course Outcomes	Assessment tool	Contribution to Program Outcomes in %							Contribution to Program Outcomes in %	Attainment level of Course Outcomes in %	Achievement (goal 70%) In Yes/ No
		PO2	PO3	PO4	PO5	PO6	PO7	PO11			
CO1	MSEQ1	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	58.58	NO
	MSEQ2	8.75	8.75	8.75	8.75	8.75	8.75	8.75	8.75		
	Assignment 1	100	100	100	100	100	100	100	100		
	Assignment2	100	100	100	100	100	100	100	100		
CO2	MSEQ2	8.75	8.75	8.75	8.75	8.75	8.75	8.75	8.75	69.58	NO
	Assignment 1	100	100	100	100	100	100	100	100		
	Assignment2	100	100	100	100	100	100	100	100		
CO3	MSEQ3	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	82.5	Yes
	Assignment 1	100	100	100	100	100	100	100	100		
	Assignment2	100	100	100	100	100	100	100	100		
CO4	MSE Q4	33.34	33.34	33.34	33.34	33.34	33.34	33.34	33.34	77.78	Yes
	Assignment 1	100	100	100	100	100	100	100	100		
	Assignment 2	100	100	100	100	100	100	100	100		
CO5	MSE Q5	41.72	41.72	41.72	41.72	41.72	41.72	41.72	41.72	80.57	Yes
	Assignment 1	100	100	100	100	100	100	100	100		
	Assignment 2	100	100	100	100	100	100	100	100		
CO6	Assignment 1	100	100	100	100	100	100	100	100	100	Yes
	Assignment 2	100	100	100	100	100	100	100	100		

Department of Electronics And Telecommunication Engineering

COURSE FILE

Analog Communication(BTETC503)

Third Year (Vth SEM)

Subject Teacher: Mohini Rajesh Mehta

Academic Year : 2022-2023

INDEX

Sr. No.	POINT
1	Syllabus
2	Course Outcomes
3	Program Outcomes
4	CO-PO Mapping Table
5	Academic Calendar
6	Lesson Plan
7	Time Table
8	Assignment Question bank
10	Question papers
11	Student Attendance
12	Student Performance in MID-SEM Exam
13	Assessment of Course Outcomes through MSE
14	Assessment of Course Outcomes through Assignments
15	Assessment of Course Outcomes

SYALLABUS

UNIT – 1 Introduction to Communication System **07 Hours**

Block schematic of communication system, Simplex and duplex systems, Modes of communication: Broadcast and point to point communication, Necessity of modulation, Classification of modulation, sampling theorem and pulse analog modulation, multiplexing: TDM, FDM.

UNIT – 2 Amplitude Modulation **07 Hours**

Introduction, Mathematical analysis and expression for AM, Modulation index, Frequency spectrum and bandwidth of AM, Power calculations, Generation of AM using nonlinear property, Low and high level modulation, Balance Modulator. Types of AM: DSB-FC, DSB-SC, SSB-SC, ISB and VSB, their generation methods and comparison.

UNIT – 3 Angle Modulation **07 Hours**

Introduction, Mathematical analysis of FM and PM, Modulation index for FM and PM, Frequency spectrum and bandwidth of FM, Narrow band and wide band FM, Direct and indirect methods of FM generation, Pre emphasis and de-emphasis, Comparison of AM, FM and PM.

UNIT – 4 Radio Receivers and Demodulators **07 Hours**

Introduction, Performances characteristic of receivers: Sensitivity, Selectivity, Fidelity, Image frequency and IFRR, Tracking and Double spotting, TRF, Super heterodyne receivers, RF amplifier, Local oscillator and mixer, IF amplifier, AGC.

UNIT – 5 AM and FM Detectors and noise **07 Hours**

AM Detectors: Envelop detector and practical diode detector.

FM Detectors: Slope detector, phase discriminator and ratio detector.

Noise: Introduction, Sources of noise, Classification of noise, Noise calculations (thermal noise), SNR, Noise figure, Noise Factor, Noise Temperature.

TEXT/REFERENCE BOOKS:

1. Kennedy, "Electronics Communications Systems", McGraw-Hill New Delhi-1997, 4th Edition.
2. Anokh Singh, "Principles of communication engineering"S.Chand
3. Roddy&Coolen, "Electronic communication"PHI
4. Taub & Schilling "Principles of communication systems" Tata Mc GrawHill
5. Beasley & Miller, "Modern Electronic Communication", Prentice-Hall India-2006, 8th Edition.
6. Wayne Tomasi, "Electronic Communication Systems", Pearson Education-2005, 5th Edition. R. G. Gupta, "Audio & Video Systems" Tata McGraw-Hill NewDelhi-2008

Course Objectives

1. To introduce the concepts of analog communication systems.
2. To equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
3. To understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase)

Course Outcomes

After successfully completing the course students will be able to

1. Understand and identify the fundamental concepts and various components of analog communication systems.
2. Understand the concepts of modulation and demodulation techniques.
3. Design circuits to generate modulated and demodulated wave.
4. Equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
5. Understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase).
6. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.
7. Develop the ability to compare and contrast the strengths and weaknesses of various communication systems.

Program Outcomes

1. The graduates will possess the knowledge of differential equations, vector calculus, complex variable, matrix theory, probability theory, physics, chemistry and electrical & electronics engineering
2. The graduate will demonstrate an ability to identify, formulate and solve Electronics & Telecommunication engineering problems
3. The graduates will have an ability to design electronic circuits and systems, analyze and interpret data.
4. The graduates will have an ability to design digital and analog systems and components
5. The graduates will possess the knowledge of advanced and emerging topics in the fields of Electronics, Signal Processing and Communication
6. The graduates will demonstrate the skills to use modern engineering tools, software and equipment's to analyze and solve real-life problems
7. The graduate will have broad understanding of the impact of Electronics and Telecommunication field in economic, environmental and social context and also will be aware of the contemporary issues
8. The graduates will possess communication skills necessary to communicate engineering ideas. The skills set include verbal, written and listening skills.
9. The graduates will demonstrate the ability to work and collaborate in heterogeneous teams.
10. The graduates will demonstrate the awareness of professional and ethical responsibilities
11. The graduates will develop self-confidence and ability for lifelong learning.

Course Outcomes and Program Outcomes Mapping Table

Academic Calendar for 2022-2023

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel: (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Dated:12/ 08/2022

Academic Calendar 2022-23 (Odd Semester) (Engineering)

Sl. No.	Activity	Commencement Date	Concluding Date	Total Days	Engineering
1	Admissions: B.Tech. Second, Third and Final Year; M.Tech. Second year.	September 01, 2022	September 10, 2022	10	UG and PG
2	Commencement of Classes of Second, Third and Final Year	September 01, 2022	December 19, 2022	110	UG and PG
3	Dissertation Examination of the Academic Year 2021-2022	September 01, 2022	September 10, 2022	10	PG
4	Mid-Semester Examinations	October 12, 2022	October 21, 2022	09	UG and PG
5	Submission of Dissertation Proposal to University	October 18, 2022	October 21, 2022	04	PG
6	Display of Mid-Semester Examination Marks	October 28, 2022	October 31, 2022	04	UG and PG
7	Scrutiny of Master's Level Dissertation Work Proposal	November 01, 2022	November 03, 2022	03	PG
8	Exam Form Filling for Regular & Supplementary Examinations	November 01, 2022	November 08, 2022	08	UG and PG
9	Exam Form Filling for Regular & Supplementary Examinations with Late Fee	November 09, 2022	November 15, 2022	07	UG and PG
10	University Tech Fest 2021	November 17, 2022	November 19, 2022	03	UG and PG
11	End of Classes	--	December 19, 2022	110	UG and PG
12	Practical/Project/Seminar Examinations	December 20, 2022	December 23, 2022	04	UG and PG
13	Uploading Internal, Mid Semester, Practical, Project and Seminar marks on University portal	December 22, 2022	December 24, 2022	03	UG and PG
14	End Semester Regular & Supplementary Examination	December 26, 2022	January 21, 2023	26	UG and PG
15	Internship/Industrial Training#				
16	Vacation	January 1, 2023	January 20, 2023	20	Faculty and Staff

डॉ. बाबासाहेब आंबेडकर तंत्रशास्त्र विद्यापीठ, लोणेरे
Dr. Babasaheb Ambedkar Technological University, Lonere
(Established under Act No XXIX of 2014 by government of Maharashtra)
विद्याविहार, लोणेरे-रायगड ४०२ १०३ (महाराष्ट्र) Vidyavihar, Lonere - Raigad 402 103 (Maharashtra)
Tel: (02140) 275142 Student Helpline: 02140-275212
Website: www.dbatu.ac.in, E-mail: registrar@dbatu.ac.in

Dr. Bhagwan F. Jogi
Registrar

डॉ. भगवान फ. जोगी
कुलसचिव

Date: 12/08/2022

17	Commencement of Classes	February 1, 2023	May 31, 2022	120	UG and PG
18	Remedial Examination	February 21, 2023	March 3,2023	10	UG and PG

#Industrial training will be carried out after completion of odd semester or in the staggered manner in the period of entire odd semester (Preferably on Saturdays, Sundays and Holidays) and partially in the vacation after odd semester. Another option could be permit the training in online mode which is not less than 120 hours.

Table 2 : List of Festivals / Holidays

Sl. No.	Festivals / Holidays	Date
1	Dasara	Wednesday, 05 October, 2022
2	Diwali Laxmi Pujan	Monday, 24 October, 2022
3	Diwali Balipratipada	Wednesday, 26 October, 2022
4	Guru Nanak Jayanti	Tuesday, 08 November, 2022

Table 3 : Following Holidays fall on Sunday

Sl. No.	Festivals / Holidays	Date
1	Mahatma Gandhi Jayanti	02 October, 2022
2	Id-E-Milad	09 October, 2022
3	Christmas	25 December, 2022

12.08.2022
(Dr. B. F. Jogi)
Registrar

Dr. Babasaheb Ambedkar Technological University, Lonere

Department of Electronics and telecommunication Engineering

Subject: Computer Network **Subject Code**: **EC41A**
Class: Final Year **Semester:** VI
Pre-requisite: Mathematics **Faculty:** Ms. M. R.Mehta

Marking Scheme

CA1 , CA2 = 10 Marks Mid-Sem = 20 marks End sem Paper- 60 marks

Reference /Text book:

1. Kennedy, "Electronics Communications Systems", McGraw-Hill New Delhi-1997, 4th Edition.
2. Anokh Singh, "Principles of communication engineering"S.Chand
3. Roddy&Coolen, "Electronic communication"PHI
4. Taub & Schilling "Principles of communication systems" Tata Mc GrawHill
5. Beasley & Miller, "Modern Electronic Communication", Prentice-Hall India-2006, 8th Edition.
6. Wayne Tomasi, "Electronic Communication Systems", Pearson Education-2005, 5th Edition. R. G. Gupta, "Audio & Video Systems" Tata McGraw-Hill NewDelhi-2008

UNIT NO.	CHAPTER NAME	LECT NO.	TOPICS
I	Physical Layer	1	Data communications, type of networks
		2	Protocol & Standards
		3	The OSI model, TCP/IP suite
		4	Addressing schemes, data & signals
		5	Transmission impairments, transmission media
		6	Data rate limits digital to digital conversion,
		7	Transmission modes
		8	Switching techniques
II	Data Link Layer	9	Error detection & correction block coding
		10	Cyclic codes, checksum
		11	Data link layer design issues,
		12	Protocols for noiseless & noisy channels
		13	Random Access, Controlled Access
		14,15	Connecting Devices: Passive Hubs, Repeaters, Active Hubs, Bridges
		16,17	Connecting Devices: Routers, Two/Three Layer Switches And Gateways
III	Networ kLayer	18	Concept of datagram & VC
		19	ICMP, IGMP, Delivery
		20	Forwarding, Unicast
		21	Multicast Routing Protocols
IV	Transport	22	Process to Process Delivery

	Layer	23	UDP, TCP
		24	Data Traffic, Congestion Control,
		25	QoS, Techniques to improve QoS,
		26	Integrated Services
V	**Application Layer**	27	Name Space, DNS, Distribution Of Name Space, ,
		28	Application Layer
		29	Resolution, DNS In Internet
		30	Telnet, Ftp
		31	E-Mail
VI	**Network Security**	32	Introduction
		33	Systematic & Asystematic Key Cryptography
		34	Security Services
		35	Digital Signature
		36	Entity Authentication
		37	Key Management

TIME-TABLE

Department of Electronics & Telecommunication Engineering

Dr. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.
Department of Electronics & Telecommunication Engineering
W.E.F. March 2022

		09:00-10:00	10:00-11:00	11:00-12:00	12:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00
MON	III-A		EM-III[104]	DE[NSJ][104]		L	EDC[JSK][106]		DE[A][KSK]/EDC[B][RKB]	
	III-B		DE[PSB][106]		EM-III[104]	U	EMI[UPP][104]		EDC[PSB][104]	
	V-A		DSP[SLN][101]	EMFT[SBD][101]	CSE[RKB][101]	N	DSP[A][PPI]/ACOMM[B][TUM]		EMFT[AAJ][101]	
	V-B	DSP[D][SSG]/ACOMM[E][AAJ]		ACOMM[AAJ][106]	DSP[SSG][106]	C	DSD[KSK][101]	AIDL[SSG][101], VLSI[NSJ][106], DCE[AAP][104]	DC[PPI][106]	AICD[PPM][101], ESC[MRM][106]
	VII-A	MTT[SVK][101], WSN[BRI][106], FOC[JSK][104]		MTT[A][UPP]/FOC[A][JSK]/WSN[A][SM]		H	MECH[A][PPM]		DC[PPI][106]	AIDL[SSG][101], VLSI[NSJ][106]
	VII-B									
TUE	III-A	DE[C][TUM]/EDC[D][PSB]	DE[NSJ][104]			L	EDC[JSK][104]	EMI[UPP][104]	EM-III[104]	
	III-B		EMI[UPP][104]		EM-III[104]	U	DE[PSB][101]		DE[E][KSK]/EDC[F][AAJ]	
	V-A		DSP[SLN][101]	EMFT[SBD][101]	ACOMM[MRM][101]	N		DSD[KSK][101]	DSP[C][AAP]/ACOMM[A][TUM]	
	V-B	DSP[F][PPI]/ACOMM[D][MRM]		ACOMM[AAJ][106]	DSD[KSK][106]	C	EMFT[AAJ][106]	DSP[SSG][106]		
	VII-A	MTT[SVK][101], WSN[BRI][106], FOC[JSK][104]	DCE[AAP][104]	MTT[B][SM]/FOC[B][JSK]/WSN[B][RKB]		H	MECH[A][PPM]		DC[PPI][106]	AIDL[SSG][101], VLSI[NSJ][106]
	VII-B									
WED	III-A	DE[B][PPI]/EDC[C][RKB]		DE[NSJ][104]	EDC[JSK][104]	L			EMI[UPP][104]	
	III-B		EDC[PSB][106]		EM-III[106]	U	EMI[UPP][104]		DE[G][PPI]/EDC[H][AAJ]	
	V-A		DSP[SLN][101]	EMFT[SBD][101]	ACOMM[MRM][101]	N	DSP[B][AAP]/ACOMM[C][MRM]			
	V-B	DSP[E][SSG]/ACOMM[F][KSK]		ACOMM[AAJ][106]		C	CSE[RKB][101]		DSD[KSK][101]	DSP[SSG][104]
	VII-A	MTT[SVK][101], WSN[BRI][106], FOC[JSK][104]	DCE[AAP][104]	AIDL[A][SSG]/VLSI[A][PSB]/DCE[A][AAP]		H	DC[PPI][106]	AIDL[SSG][101], VLSI[NSJ][106]	FM[AAP][106]	AICD[PPM][101], ESC[MRM][106]
	VII-B									
THU	III-A			DE[NSJ][104]		L	DE[D][UPP]/EDC[A][JSK]			
	III-B	DE[F][TUM]/EDC[G][JSK]			EM-III[104]	U		EDC[PSB][106]	DE[PSB][106]	
	V-A		DSP[SLN][101]	EMFT[SBD][101]	ACOMM[MRM][101]	N		DSD[KSK][101]	CSE[RKB][101]	
	V-B			ACOMM[AAJ][106]		C	EMFT[AAJ][104]	CSE[RKB][104]	DSD[KSK][104]	DSP[SSG][104]
	VII-A	MECH[PPM][101]	DC[PPI][106]	AIDL[B][SSG]/VLSI[B][SM]/DCE[B][AAP]		H	FM[AAP][106]	MECH[B][PPM]		AICD[PPM][101], ESC[MRM][106]
	VII-B		FM[AAP][104]				DC[PPI][101]			
FRI	III-A		EM-III[104]	EM-III[104]	EDC[JSK][104]	L		EMI[UPP][104]	EMI[UPP][104]	
	III-B	DE[H][UPP]/EDC[E][PSB]			EMI[UPP][101]	U	EDC[PSB][106]	DE[PSB][106]		
	V-A			DSD[KSK][101]		N	ACOMM[MRM][101]	DSD[KSK][101]	CSE[RKB][101]	CSE[RKB][101]
	V-B			CSE[RKB][106]	CSE[RKB][106]	C	EMFT[AAJ][104]			
	VII-A		DC[PPI][106]	AICD[A][PPM]/ESC[A][MRM]		H	AICD[B][PPM]/ESC[B][SM]		MECH[PPM][104]	MECH[PPM][104]
	VII-B		FM[AAP][101]							
SAT	VII-A			GATE COACHING			GATE COACHING			DEPARTMENTAL METTING
	VII-B									

Question Bank AY 2022-23

Assignment on Unit-1

Q. 1 Define Communication and Explain the Analog communication system.

Q.2 Write the difference between Analog communication and Digital communication

Q.3 Explain the different modes of transmission .

Q.4 Explain different types of communication

Q. 5 What is modulation ? What is need of modulation ?

Q.6 What are the advantages of using Modulation ?

Q.7 Give the classification Modulation

Q.8 What is sampling Theorem ?

Q.9 Write the difference between FDM and TDM

Q.10 Draw the Electromagnetic Spectrum in the terms of frequency range

Q. 11 define:

A Wavelength
B bandwidth
C Baseband Signal
D **Carrier signal**
E Message signal

Assignment on Unit-3

Q. 1 Define Communication and Explain the Angle Modulation

Q.2 What is modulation ? Derive the expression for Modulation index for FM

Q.3 What is modulation ? Derive the expression for Modulation index for PM

Q.4 Explain Narrow band and wide band FM

Q. 5 Derive the expression for PM wave

Q. 5 Derive the expression for FM wave

Q.6 Explain the frequency spectrum for FM wave.

Q. 7 Explain the Carsons rule

Q.8 1. A 500-Hz modulating voltage fed into a PM generator produces a frequency deviation of2.25 kHz. What is the modulation index? If the amplitude of the modulating voltage is kept constant, but its frequency is raised to 6 kHz, what is the new deviation?

Q.9 When the modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. What is the modulating index when the modulating frequency is reduced to 250 Hz and the modulating voltage is simultaneously raised to 3.2 V?

Q.10 . The equation of an angle-modulated voltage is v = 10 sin (W8t + 3 sin I04t). What form of angle modulation is this? Calculate the carrier and modulating frequencies, the modulation index and deviation, and the power dissipated in a 100-0 resistor.

Q.11. The center frequency of an LC oscillator, to which a capacitive reactance FET modulator is connected, is 70 MHz. The FET has a gm which varies linearly from 1 to 2 mS, and · a bias capacitor whose reactance is 10 times the resistance of the bias resistor. If the fixed tuning capacitance across the oscillator coil is 25 pF, calculate the maximum available frequency deviation.

Q.12. An RC capacitive reactaqce modulator is used to vary the frequency of a IO-MHz oscillator by ± 100 kHz. An FET whose transconductance varies linearly with gate voltage from Oto 0.628 mS, is used in conjunction with a resistance whose value is one-tenth of the capacitive reactance used. Calculate the inductance and capacitance of the oscillator tank circuit.

ALL THE SOLVED PROBLEMS FROM KENNEDY CHAPTER 4

Assignment on Unit-3

1-2 Marks Questions:

Q.1 Define the following terms -

a) Hub
b) Switch
c) Router
d) Bridge
e) Gateway
f) Repeater
g) Ethernet
h) Bluetooth
i) Virtual LAN

Q.2 Compare the following networking devices -

a) Hub and Switch
b) Router and Bridge
c) Router and Switch
d) Hub and Bridge

5 -7 Marks Questions:

Q.1 Explain the following networking devices in detail

a) Switch
b) Router
c) Bridge
d) Gateway
e) Repeater
f) Hub

Q.2 Write a note on

a) Standard Ethernet
b) Fast Ethernet
c) Gigabit Ethernet
d) 10-Gigabit Ethernet
e) IEEE 802.11 Standards
f) Virtual LANs

Assignment on Unit-4

Questions:

1. What are the responsibilities of Network Layer?
2. Write Short Note on
   a) IPV4 Addressing
   b) IPV6 Addressing
   c) Routing Table
3. What are the types of class full addressing? And Function of each class address
4. Define : Netid and Hostid
5. Define : Subnetting and Supernetting
6. What is Default masks for class A, B, C addressing
7. What is need for Classless addressing
8. What is the need for IPV6 Addressing
9. Discuss the Address Resolution Protocol.
10. Discuss the Reverse Address Resolution Protocol.
11. Change the following IPv4 addresses from binary notation to dotted-decimal notation.
    a. 10000001 00001011 00001011 11101111
    b. 11000001 10000011 00011011 11111111
12. Change the following IPv4 addresses from dotted-decimal notation to binary notation.

a. 111.56.45.78
b. 221.34.7.82

13. Find the error, if any, in the following IPv4 addresses.

a) 111.56.045.78
b) 221.34.7.8.20
c) 75.45.301.14
d) 11100010.23.14.67

14. Find the class of the following IP addresses.

a) 208.34.54.12
b) 238.34.2.1
c) 114.34.2.8
d) 129.14.6.8

15. Find the netid and the hostid of the following IP addresses.

a. 114.34.2.8
b. 132.56.8.6
c. 208.34.54.12

16. A block of addresses is granted to a small organization. We know that one of the addresses is 205.16.37.39/28.

a. What is the first address in the block?
b. Find the last address for the block
c. Find the number of addresses

17. Find the sub network address and the host-ID for the following

a. IP Address – 120.14.22.16 & Mask- 255.255.128.0
b. IP Address – 140.11.36.22 & Mask- 255.255.255.0
c. IP Address – 141.181.14.16 & Mask- 255.255.224.0
d. IP Address – 200.34.22.156 & Mask- 255.255.255.240

18. In a block of addresses, we know the IP address of one host is 25.34.12.56/16. What are the first address (network address) and the last address (limited broadcast address) in this block?

19. In a block of addresses, we know the IP address of one host is 182.44.82.16/26. What are the first address (network address) and the last address in this block?

20. An ISP is granted a block of addresses starting with 190.100.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows:

a. The first group has 64 customers; each needs 256 addresses.
b. The second group has 128 customers; each needs 128 addresses.
c. The third group has 128 customers; each needs 64 addresses.

Design the sub-blocks and find out how many addresses are still available after these allocations.

21. An ISP is granted a block ofaddresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows.

a. The first group has 200 medium-size businesses; each needs 128 addresses.
b. The second group has 400 small businesses; each needs 16 addresses.
c. The third group has 2000 households; each needs 4 addresses.

Design the sub-blocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.

Assignment on Unit-5

Questions:

1. What are the responsibilities of Transport Layer?
2. Compare the TCP AND UDP
3. The UDP header in hexadecimal format is as : BC82000D002B001D Obtain the following from it:
   1. Source port number
   2. Destination port number
   3. Total length
   4. Length of the data.
   5. Name of client process.

4. The UDP header in hexadecimal format is as : CB84000D001C001C Obtain the following from it:
   1. Source port number
   2. Destination port number
   3. Total length
   4. Length of the data.
   5. Name of client process

5. The UDP header in hexadecimal format is as : 0045000D0058FE20 Obtain the following from it
   1. Source port number
   2. Destination port number
   3. Total length
   4. Length of the data.
   5. Name of client process

6. The UDP header in hexadecimal format is as : 0632000D001CE217 Obtain the following from it:
   1. Source port number

2. Destination port number
3. Total length
4. Length of the data.
5. Name of client process

7. Write short notes on
    a. TCP
    b. UDP

Assignment on Unit-6

Write Short Note on following:

a. Domain Name Space (DNS)
b. DDNS
c. TELNET
d. EMAIL
e. File Transfer Protocol (FTP),
f. WWW
g. HTTP
h. Firewalls

CA1 & CA2 Evaluation Criteria

Test →	CA2
Criteria	**Marks allocated for assignments**
Assignment1	3
Assignment2	3
Assignment3	4
Assignment4	----
Assignment5	---
Assignment6	---

i. ** Correct answering of tricky questions answered during regular classes is also considered for CA1 and CA2 evaluation. Those who answered questions correctly are considered for 1 or 2 extra marks in addition to the marks obtained after assignment completion.

CA -1 (Analog communication)

1. Explain all blocks of Analog communication system. (5M)
2. Derive the expression for modulation index in terms of (i)Vm and Vc (ii)Vamx and Vmin for DSBFC wave (5M)

1. What is need of modulation ? (5M)
2. Derive the expression for modulation index in terms of (i)Vm and Vc (ii)Vamx and Vmin for DSBFC wave (5M)

Question Papers AY 2022-23

Dr. Babasaheb Ambedkar Technological University, Lonere-Raigad.

Department of Electronics and Telecommunication Engineering

Subject: **BTETC503 Analog Communication** Semester: VI

Date: 31 /10/2022 Time: 2:30 to 3:30 Max. Marks: 20

Q. 1 What is modulation? What is need of modulation? (5M)

Q.2 Explain the process of generation of SSB using *the phase shift method*. (5M)

Q.3 An AF signal $v_m = 20 \sin (2\pi \times 500t)$ is used to amplitude modulate a carrier of $v_c = 50 \sin (2x10^5 t)$ Calculate: (5M)

(a) Modulation index

(b) Sideband frequencies

(c) Amplitude of each sideband frequency

(d) Bandwidth required

(e) Total power delivered into a load of 600.

Q.4 A 400 W carrier is amplitude modulated to a depth of 100%. Calculate the total power in case of **(a)** SSB technique? **(b)** VSB technique if 20% of the other sideband is transmitted along with wanted sideband. How much more power (in W) is required for VSB compared to SSB? (5M)

End of the Question Paper

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Winter 2023

Course: B. Tech. **Branch : E & T C** **Semester : V**

Subject Code & Name: BTETC503 - Analog Communication Engineering

Max Marks: 60 **Date:** **Duration: 3.45 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Answer Any Two of the following.**		
A)	Define Communication and Explain the complete Analog communication system.	**CO 01**	**6**
B)	What is modulation? Give the classification Modulation with definition	**CO 01**	**6**
C)	Write the difference between i)FDM and TDM ii) Analog communication and Digital communication	**CO 01**	**6**
Q.2	**Answer Any Two of the following.**		
A)	Explain DSBFC Technique in detail with the help of (i) frequency spectrum (ii) Time domain representation (iii) power relation with carrier wave	**CO 02**	**6**
B)	Calculate the percentage power saving when the carrier and one of the sidebands are suppressed in an AM wave modulated to the depth of (i) 70% and (ii) 65%	**CO 02**	**6**
C)	Explain generation of AM using Nonlinear resistance device	**CO 03**	**6**
Q. 3	**Answer/Solve Any Two of the following.**		
A)	What is Angle modulation? Derive the mathematical expression for PM.	**CO 05**	**6**
B)	Explain Narrowband and Wideband FM Also compare the FM and AM.	**CO 05**	**6**
C)	In an FM system, when the audio frequency (AF) is 500 Hz, and the AF voltage is 2.4 V, the deviation is 4.8 kHz. If the AF voltage is now increased to 7.2 V, what is the new deviation? If the AF voltage is further raised to 10 V while the AF is dropped to 200 Hz, what is the deviation? Find the modulation index in each case.	**CO 05**	**6**
Q.4	**Answer the following.**		
A)	Define: (i) Sensitivity, (ii) Selectivity, (iii) Fidelity, (iv) Image frequency and its rejection.	**CO 07**	**6**

B)	Explain working of Superheterodyne receiver in detail.	**CO 04**	**6**

Q. 5 **Solve the following.**

A)	Two resistors 20 kΩ and 50 kΩ are at room temperature (290 K). Calculate for bandwidth of 100 KHz, the thermal noise for the following conditions: (i) For resistor 20 kΩ (ii) For resistor 50 kΩ (iii) For two resistors in series (iv) For two resistors in parallel.	**CO 04**	**8**
B)	An amplifier operating over the frequency range from 3 to 10MHz has a 20K input resistance. What is the rms noise voltage at the input to this amplifier at room temperature?	**CO 04, 06**	**4**

***** End *****

Dr. Babasaheb Ambedkar Technological University, Lonere

Student Attendance

Department of Electronics and TeleCommunication Engineering

Third Year 2022-2023 (DIV-A)

Subject: ANALOG COMMUNICATION (BTETC503) — **MOHINI R MEHTA**

			21/11/22	22/11/22	24/11	29/11	5/12	9/12	15/12	17/12	20/12	22/12		
1	AAKANKSHA S JAMDAR	T2030331372001						AB	P	P	P	P		
2	ABHISHEK SHARMA	T2030331372002							P	P	P	P		
3	ADITYA R KADAM	T2030331372003						AB	P	P	P	P		
4	AFZAL A BADE	T2030331372005							P	P	P	P		
5	ANISH A MOHITE	T2030331372006							P	P	P	P		
6	ASHISH S BHALERAO	T2030331372007							P	P	P	P		
7	BALAJI B BHOSALE	T2030331372008							P	P	P	P		
8	BHAGYASHRI D KADVEKAR	T2030331372009	AB						P	P	P	P		
9	CHAITANYA D SURATI	T2030331372010						AB	P	P	P	P		
10	CHINMAYI K DUGHREKAR	T2030331372011							P	P	P	P		
11	DIPESHRI D DHEPE	T2030331372012		AB					P	P	P	P		
12	HIMANSHU M CHAUDHARI	T2030331372013			AB	AB	A	AB	AB	P	AB	P		
13	JANMEJAY R DHAKE	T2030331372014		AB				AB	P	P	P	P		
14	RUIKAR KHUSHI V	T2030331372015							P	P	P	P		
15	MAHESH V KOKANE	T2030331372016							P	P	P	P		
16	MANALI M RAUL	T2030331372017			AB	AB	AB	AB						
17	MHATRE MANASVI A	T2030331372018							P	P	P	P		
18	GHARAT MAYURESH R	T2030331372019							P	P	P	P		
19	MEGHRAJ D PATIL	T2030331372020							P	P	P	P		
20	MOHANISH S GURU	T2030331372021							P	P	P	P		
21	NIKITA B MARDASKAR	T2030331372022	AB					AB	P	P	P	P		
22	NIRAJ A KADAM	T2030331372023		AB	AB	AB	AB	AB						
23	OM S PAWAR	T2030331372024							P	P	P	P		
24	OM S SALUNKE	T2030331372025							P	P	P	P		
25	OMKAR H ZAWARE	T2030331372026		AB				AB	P	P	P	P		
26	SATHE OMKAR D	T2030331372027	AB						P	P	P	P		
27	POOJA V DANGE	T2030331372028							P	P	P	P		
28	PRANAV R JAGTAP	T2030331372029	AB	AB					P	P	P	P		
			2hr	2hr										

Department of Electronics and TeleCommunication Engineering

Third Year 2022-2023(DIV-A)

Subject: **ANALOG COMMUNICATION (BTETC503)** **MOHINI R MEHTA**

			21/10/22	22/11/22										
29	PRANJALI P JADHAV	T2030331372030	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav						
30	PRATHAM N DUBEY	T2030331372031	Leave	Leave	AB	AB	AB	AB						
31	PRITHVI V AVARADI	T2030331372032	AB	AB		AB	AB	AB						
32	PURUSHOTTAM D PAWAR	T2030331372033		Pawar	Pawar	Pawar	Pawar							
33	ROHIT S JADHAV	T2030331372034												
34	RUSHIKESH S DHADE	T2030331372035	Rushi	Rushi	Rushi	Rushi	Rushi							
35	SAHIL S KADAM	T2030331372037		AB	AB	AB	AB							
36	NAIK SAHIL M	T2030331372038												
37	SAHIL S DIVEKAR	T2030331372039	Shivkar	Shivkar	Shivkar	Shivkar	Shivkar	Shivkar						
38	SAKSHI S KALASKAR	T2030331372041	Sakshi	Sakshi	Sakshi	Sakshi	Sakshi	Sakshi						
39	SAMBHAJI A BANSODE	T2030331372042												
40	CHANDORKAR SAMIDHA N	T2030331372043												
41	SAMIKSHA V DHEPE	T2030331372044	Dhepe	Dhepe	Dhepe	Dhepe	Dhepe	Dhepe						
42	SAMRUDDHI R NAIK	T2030331372045	Naik	AB	Naik	Naik	Naik	Naik						
43	SARAH A HASWARE	T2030331372046	Sahu	Sahu	Sahu	Sahu	Sahu							
44	SAURABH S PACHILING	T2030331372049			AB	AB	AB							
45	SEJAL V KARDE	T2030331372050	Karde	AB	Karde	Karde	Karde							
46	SHIVANI H KOLI	T2030331372051	S.H.koli	S.H.koli	S.H.koli	S.H.koli	S.H.koli	S.H.koli						
47	SHIVARAJ V DASARWAR	T2030331372052	Shivraj	shivraj	shivraj	shivraj	shivraj	Shivraj						
48	SNEHA V AAHER	T2030331372053	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher							
49	SONALI V MORE	T2030331372054	Sonali	Sonali	Sonali	Sonali	Sonali	Sonali						
50	SONALI S DALVI	T2030331372055	Salvi	Salvi	Salvi	Salvi	Salvi	Salvi						
51	SRUSHTI R LOKHANDE	T2030331372056	Lokhande	Lokhande	Lokhande	Lokhande	Lokhande							
52	SURYAPRAKASH P SHENDGI	T2030331372058	Shendge	Shendge	Shendge	Shendge	Shendge							
53	TANAY A SALUNKE	T2030331372059	spray	spray	spray	spray	spray	spray						
54	Sarah Badar	T2030331372047	Badar	Badar	AB	AB	AB	AB						
55														
56														

Department of Electronics and TeleCommunication Engineering

Third Year 2022-2023 (DIV-A)

Subject: **ANALOG COMMUNICATION (BTETC503)** **MOHINI R MEHTA**

			07/10	07/10	10/10	12/10	18/10	18/10	19/10	19/10	21/10	7/11	9/11	11/11
1	AAKANKSHA S JAMDAR	T2030331372001							Present					
2	ABHISHEK SHARMA	T2030331372002							AB	AB				
3	ADITYA R KADAM	T2030331372003		AB					AB	AB				
4	AFZAL A BADE	T2030331372005		AB					Present					
5	ANISH A MOHITE	T2030331372006	AB	AB					AB	AB				
6	ASHISH S BHALERAO	T2030331372007		AB					AB					
7	BALAJI B BHOSALE ★	T2030331372008	AB	AB					Present					
8	BHAGYASHRI D KADVEKAR	T2030331372009							Present					
9	CHAITANYA D SURATI	T2030331372010	AB	AB	AB									
10	CHINMAYI K DUGHREKAR	T2030331372011												
11	DIPESHRI D DHEPE	T2030331372012												
12	HIMANSHU M CHAUDHARI	T2030331372013	AB											
13	JANMEJAY R DHAKE	T2030331372014	AB											
14	RUIKAR KHUSHI V	T2030331372015			AB				Present					
15	MAHESH V KOKANE	T2030331372016							Present					
16	MANALI M RAUL	T2030331372017												
17	MHATRE MANASVI A	T2030331372018												
18	GHARAT MAYURESH R	T2030331372019							AB					
19	MEGHRAJ D PATIL	T2030331372020												
20	MOHANISH S GURU	T2030331372021	AB											
21	NIKITA B MARDASKAR	T2030331372022												
22	NIRAJ A KADAM	T2030331372023	AB		AB									
23	OM S PAWAR	T2030331372024	AB											
24	OM S SALUNKE	T2030331372025												
25	OMKAR H ZAWARE	T2030331372026	AB											
26	SATHE OMKAR D	T2030331372027	AB											
27	POOJA V DANGE	T2030331372028	AB											
28	PRANAV R JAGTAP	T2030331372029	AB											

20, 21, 29, 31, 1 ← Mid Sem Exam

22 – 27 ← Diwali

Department of Electronics and TeleCommunication Engineering

Third Year 2022-2023(DIV-A)

Subject: **ANALOG COMMUNICATION (BTETC503)** **MOHINI R MEHTA**

					10/10/22	12/10	18/10	18/10	19/10	19/10				
29	PRANJALI P JADHAV	T2030331372030	Jadhav	AB	Jadhav	Jadhav	Jadhav	Jadhav	Present	Jadhav	Jadhav	Jadhav	Jadhav	
30	PRATHAM N DUBEY	T2030331372031	AB		Pratham	Pratham	Pratham	Pratham						
31	PRITHVI V AVARADI	T2030331372032			AB									
32	PURUSHOTTAM D PAWAR	T2030331372033	Pawar	AB	Pawar	Pawar	Pawar	Pawar	—	Pawar	Pawar	Pawar	Pawar	
33	ROHIT S JADHAV	T2030331372034	Jadhav		Jadhav	Jadhav	Jadhav	Jadhav	Present	Jadhav	Jadhav	Jadhav	Jadhav	
34	RUSHIKESH S DHADE	T2030331372035	Rushi		Rushi	Rushi	Rushi	Rushi		Rushi	Rushi	Rushi	Rushi	
35	SAHIL S KADAM	T2030331372037	AB	AB	Shadu									
36	NAIK SAHIL M	T2030331372038			Sahil					Sahil	Sahil	Sahil	Sahil	
37	SAHIL S DIVEKAR	T2030331372039	Shivekar		Shivekar	Shivekar	Shivekar	Shivekar	Present	Shivekar	Shivekar	Shivekar	Shivekar	
38	SAKSHI S KALASKAR	T2030331372041	Sakshi		Sakshi	Sakshi	Sakshi	Sakshi			Sakshi	Sakshi	Sakshi	
39	SAMBHAJI A BANSODE	T2030331372042	Sambhaji	AB	Sambhaji	Sambhaji	Sambhaji	Sambhaji	—	Sambhaji	Sambhaji	Sambhaji	Sambhaji	
40	CHANDORKAR SAMIDHA N	T2030331372043	AB		Samidha					Samidha	Samidha	Samidha	Samidha	
41	SAMIKSHA V DHEPE	T2030331372044	Shepe	Shepe	Shepe	Shepe	Shepe	Shepe	Present	Shepe	Shepe	Shepe	Shepe	
42	SAMRUDDHI R NAIK	T2030331372045	Naik		Naik	P		P	Present	Naik	Naik	Naik	Naik	
43	SARAH A HASWARE	T2030331372046	Sahil		AB	Sahil	Sahil	Sahil	Present	Sahil	Sahil	Sahil	Sahil	
44	SAURABH S PACHILING	T2030331372049	AB	AB	Saurabh	Saurabh					Saurabh	Saurabh	Saurabh	
45	SEJAL V KARDE	T2030331372050			Sejal	P		P	—	Sejal	Sejal	Sejal	Sejal	
46	SHIVANI H KOLI	T2030331372051			S.H.Koli	S.H.Koli	S.H.Koli	S.H.Koli	Present	S.H.Koli	S.H.Koli	S.H.Koli	S.H.Koli	
47	SHIVARAJ V DASARWAR ☆	T2030331372052	Shivaraj	Shivaraj	Shivaraj	Shivaraj	Shivaraj	Shivaraj	Present	Shivaraj	Shivaraj	Shivaraj	Shivaraj	
48	SNEHA V AAHER	T2030331372053	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	Present	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	
49	SONALI V MORE	T2030331372054	Sonali						Present	Sonali				
50	SONALI S DALVI	T2030331372055	Sonali		Sonali	Sonali	Sonali	Sonali	Present	Sonali	Sonali	Sonali	Sonali	
51	SRUSHTI R LOKHANDE	T2030331372056	AB	AB	Shrushti						Shrushti	Shrushti	Shrushti	
52	SURYAPRAKASH P SHENDGE	T2030331372058	Shivaji	Shivaji	Shivaji	Shivaji	Shivaji	Shivaji			Shivaji	Shivaji	Shivaji	
53	TANAY A SALUNKE	T2030331372059	Tanay	AB	Tanay	Tanay	Tanay	Tanay	AB	—	Tanay	Tanay	Tanay	
54	Sarah Badar	T2030331372047	[redacted]	AB	AB	AB	AB	AB			AB	AB	AB	
55														
56														

Assignment
Jadhav
Purushottam
Rushi
Shadu
Sakshi
Sambhaji
Samidha
Shepe
Naik
Sahil
Sejal
S.H.Koli
Shivaraj
S.V.Aaher
Sonali
Shrushti
Shivaji
Tanay
AB Badar

Department of Electronics and TeleCommunication Engineering

Third Year 2022-2023 (DIV-A)

Subject: ANALOG COMMUNICATION (BTETC503) MOHINI R MEHTA

			8/9/22	9/9/22	13/9/22	14/9/22	16/9/22	20/9/22	21/9/22	22/9/22	29/9/22	29/9/22	03/10	04/10
1	AAKANKSHA S JAMDAR	T2030331372001	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
2	ABHISHEK SHARMA	T2030331372002												
3	ADITYA R KADAM	T2030331372003												
4	AFZAL A BADE	T2030331372005												
5	ANISH A MOHITE	T2030331372006												
6	ASHISH S BHALERAO	T2030331372007												
7	BALAJI B BHOSALE	T2030331372008												
8	BHAGYASHRI D KADVEKAR	T2030331372009												
9	CHAITANYA D SURATI	T2030331372010												
10	CHINMAYI K DUGHREKAR	T2030331372011												
11	DIPESHRI D DHEPE	T2030331372012												
12	HIMANSHU M CHAUDHARI	T2030331372013												
13	JANMEJAY R DHAKE	T2030331372014												
14	RUIKAR KHUSHI V	T2030331372015												
15	MAHESH V KOKANE	T2030331372016												
16	MANALI M RAUL	T2030331372017												
17	MHATRE MANASVI A	T2030331372018												
18	GHARAT MAYURESH R	T2030331372019												
19	MEGHRAJ D PATIL	T2030331372020												
20	MOHANISH S GURU	T2030331372021												
21	NIKITA B MARDASKAR	T2030331372022												
22	NIRAJ A KADAM	T2030331372023												
23	OM S PAWAR	T2030331372024												
24	OM S SALUNKE	T2030331372025												
25	OMKAR H ZAWARE	T2030331372026												
26	SATHE OMKAR D	T2030331372027												
27	POOJA V DANGE	T2030331372028												
28	PRANAV R JAGTAP	T2030331372029												

2-8 ⇒ No Students

Department of Electronics and TeleCommunication Engineering

Third Year 2022-2023(DIV-A)

Subject: **ANALOG COMMUNICATION (BTETC503)** **MOHINI R MEHTA**

						14/9/22		20/9/22	21/9/22			29/9/22	03/10	04/10
29	PRANJALI P JADHAV	T2030331372030			AB.			Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav	Jadhav
30	PRATHAM N DUBEY	T2030331372031			Pratham			Pratham	Pratham	AB	Pratham	Pratham	Pratham	Pratham
31	PRITHVI V AVARADI	T2030331372032			AB			AB	AB	AB	AB	AB		
32	PURUSHOTTAM D PAWAR	T2030331372033			AB			Purus	Purus	Purus	Purus	Purus	Purus	Purus
33	ROHIT S JADHAV	T2030331372034			AB			Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit
34	RUSHIKESH S DHADE	T2030331372035			AB			Rushi	Rushi	Rushi	Rushi	Rushi	Rushi	Rushi
35	SAHIL S KADAM	T2030331372037			Skadam	Skadam	AB	Skadam	AB	Skadam	Skadam	AB	Skadam	Skadam
36	NAIK SAHIL M	T2030331372038			AB	AB	AB	Sahil	Sahil	Sahil	Sahil	Sahil	Sahil	Sahil
37	SAHIL S DIVEKAR	T2030331372039	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar	Sdivekar
38	SAKSHI S KALASKAR	T2030331372041			AB	AB	AB	AB	AB	Sakshi	Sakshi	Sakshi	Sakshi	Sakshi
39	SAMBHAJI A BANSODE -	T2030331372042			AB	AB	AB	Sambh	Sambh	Sambh	Sambh	Sambh	Sambh	Sambh
40	CHANDORKAR SAMIDHA N	T2030331372043			Samidha	AB	Samidha	Samidha	Samidha	Samidha	AB	AB	Samidha	Samidha
41	SAMIKSHA V DHEPE	T2030331372044			Shepe	Shepe	Shepe	Shepe	Shepe	Shepe	Shepe	Shepe	Shepe	Shepe
42	SAMRUDDHI R NAIK	T2030331372045			Snaik		Snaik	Snaik	Snaik	Snaik	Snaik	Snaik	Snaik	Snaik
43	SARAH A HASWARE	T2030331372046			AB		AB	Sahil	Sahil	Sahil	Sahil	Sahil	Sahil	Sahil
44	SAURABH S PACHILING	T2030331372049			AB		AB	Saur	Saur	AB	Saur	Saur	Saur	Saur
45	SEJAL V KARDE	T2030331372050			AB		AB	Skarde	Skarde	AB	Skarde	Skarde	Skarde	Skarde
46	SHIVANI H KOLI	T2030331372051			S.H.koli	S.H.koli	S.H.koli	S.H.koli	S.H.koli	S.H.koli	S.H.koli	S.H.koli		
47	SHIVARAJ V DASARWAR	T2030331372052			AB	AB	AB	Shivaraj	Shivaraj	Shivaraj	AB	AB	Shivaraj	Shivaraj
48	SNEHA V AAHER	T2030331372053		S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher	S.V.Aaher
49	SONALI V MORE	T2030331372054			AB			Sneha	Sneha	Sneha	Sneha	AB	Sneha	Sneha
50	SONALI S DALVI	T2030331372055			AB			Ssalvi	Ssalvi	Ssalvi	AB	Ssalvi	Ssalvi	Ssalvi
51	SRUSHTI R LOKHANDE	T2030331372056			AB			Rlokhde	Rlokhde	Rlokhde	Rlokhde	Rlokhde		
52	SURYAPRAKASH P SHENDGE	T2030331372058			AB			Shendge	Shendge	Shendge	Shendge	Shendge	Shendge	Shendge
53	TANAY A SALUNKE	T2030331372059			AB			AB	AB	AB	prayas	prayas	prayas	prayas
54	Sarah Badar	T2030331372047			Sbadar			Sbadar	AB	Sbadar	AB	Sbadar	Sbadar	Sbadar
55					AB			AB						
56					AB			AB						

Student Performance

Sr.	ROLL NUMBER	MID-SEM MARKS(20)	CA1	CA2	TOTAL
1	1930331372001	12	9	9	**30**
2	1930331372002	13	9	9	**31**
3	1930331372003	15	9	9	**33**
4	1930331372004	15	9	9	**33**
5	1930331372005	16	9	8	**33**
6	1930331372006	18	9	9	**36**
7	1930331372007	14	9	8	**31**
8	1930331372008	15	9	8	**32**
9	1930331372010	6	7	9	**22**
10	1930331372011	6	8	8	**22**
11	1930331372012	15	7	9	**31**
12	1930331372013	14	9	9	**32**
13	1930331372014	10	9	9	**28**
14	1930331372015	14	9	8	**31**
15	1930331372016	7	7	8	**22**
16	1930331372031	9	6	8	**23**
17	1930331372032	9	8	9	**26**
18	1930331372033	11	8	9	**28**
19	1930331372053	10	7	9	**26**
20	1930331372054	10	9	9	**28**
21	1930331372055	14	9	9	**32**
22	1930331372056	9	9	9	**27**
23	1930331372058	11	9	9	**29**
24	1930331372060	8	9	9	**26**
25	1930331372061	10	9	9	**28**
26	1930331372063	10	9	9	**28**
27	1930331372064	7	9	9	**25**
28	1930331372065	7	7	9	**23**
29	1930331372066	14	9	8	**31**
30	1930331372067	12	7	9	**28**
31	1930331372068	9	9	9	**27**
32	1930331372069	14	9	9	**32**
33	1930331372076	10	9	9	**28**
34	1930331372077	10	9	9	**28**
35	1930331372078	12	9	9	**30**
36	1930331372081	17	9	9	**35**
37	1930331372082	14	7	9	**30**
38	1930331372083	12	8	8	**28**
39	1930331372084	11	9	9	**29**
40	1930331372087	10	7	9	**26**
41	1930331372088	1	9	9	**19**
42	1930331372090	2	9	8	**19**
43	1930331372091	13	7	8	**28**
44	1930331372093	8	9	9	**26**
45	1930331372094	AB	AB	AB	**AB**
46	1930331372096	4	8	9	**21**
47	1930331372098	11	7	9	**27**

48	1930331372099	10	7	8	**25**
49	1930331372100	12	7	9	**28**
50	1930331372102	16	9	9	**34**
51	1930331372103	11	8	9	**28**
52	1930331372104	13	9	9	**31**
53	1930331372105	7	4	8	**19**
54	1930331372106	4	7	8	**19**
55	1930331372107	9	8	8	**25**
56	1930331372108	14	7	9	**30**
57	1930331372109	8	8	9	**25**
58	1930331372111	11	8	8	**27**
59	1930331372112	19	7	8	**34**
60	1930331372115	9	7	8	**24**
61	1930331372116	9	9	8	**26**
62	1930331372117	10	9	9	**28**
63	103033201811372 10074	7	0	0	**7**
64	103033201811372 10129	4	7	8	**19**
65	2030331372001	12	9	8	**29**
66	2030331372002	16	6	8	**30**
67	2030331372003	12	7	8	**27**
68	2030331372004	10	8	8	**26**
69	2030331372005	18	9	9	**36**
70	2030331372006	9	9	9	**27**
71	2030331372007	8	8	9	**25**
72	2030331372008	6	9	9	**24**
73	2030331372009	10	7	8	**25**
74	2030331372010	19	7	8	**34**
75	2030331372011	8	8	8	**24**
76	2030331372012	7	8	8	**23**
77	2030331372013	9	8	8	**25**
78	2030331372014	9	7	8	**24**
79	2030331372015	12	9	8	**29**
80	2030331372016	7	8	9	**24**
81	2030331372017	6	9	8	**23**
82	2030331372018	9	4	8	**21**
83	2030331372019	11	7	8	**26**
84	2030331372020	6	9	8	**23**
85	2030331372021	6	9	8	**23**
86	2030331372022	9	9	9	**27**
87	10303320171137213015	AB	AB	AB	AB

Assessment of Course Outcomes through MSE

MSE Question Numbers	Q.1 /5	Q.2 /5	Q.3 / 5	Q.4 / 5	Q.5 / 5
Relevant Course Outcomes	CO1, CO2	CO1, CO3,CO2	CO1, CO5, CO2,CO6	CO1,CO6,CO5	CO1,CO3,CO2,CO5
Enrollment Number					
1930331372001	4	NA	2	4	2
1930331372002	4	NA	3	4	2
1930331372003	4	4	NA	4	3
1930331372004	4	NA	3	4	4
1930331372005	4	NA	4	4	4
1930331372006	4	5	NA	5	4
1930331372007	4	NA	2	4	4
1930331372008	4	3	NA	4	4
1930331372010	2	NA	NA	3	1
1930331372011	3	NA	NA	2	1
1930331372012	4	3	NA	4	4
1930331372013	4	NA	2	4	4
1930331372014	4	NA	NA	3	3
1930331372015	4	NA	2	4	4
1930331372016	2	NA	NA	3	2
1930331372031	3	NA	NA	3	3
1930331372032	3	NA	NA	3	3
1930331372033	4	NA	NA	4	3
1930331372053	4	NA	NA	3	3
1930331372054	4	NA	NA	3	3
1930331372055	4	3	NA	4	3
1930331372056	3	NA	NA	3	3
1930331372058	4	2	NA	3	2
1930331372060	2	2	NA	2	2
1930331372061	3	2	NA	3	2
1930331372063	3	NA	2	3	2
1930331372064	2	1	NA	2	2
1930331372065	2	2	NA	2	1
1930331372066	4	NA	2	4	4
1930331372067	4	NA	NA	4	4

1930331372068	3	3	NA	3	NA
1930331372069	4	3	NA	4	3
1930331372076	3	NA	1	3	3
1930331372077	4	NA	NA	3	3
1930331372078	4	2	NA	4	2
1930331372081	4	4	NA	5	4
1930331372082	4	2	NA	4	4
1930331372083	4	NA	NA	4	3
1930331372084	4	NA	NA	4	3
1930331372087	4	1	NA	3	2
1930331372088	1	NA	NA	NA	NA
1930331372090	1	NA	NA	1	NA
1930331372091	4	NA	1	4	4
1930331372093	2	2	NA	3	1
1930331372096	2	NA	NA	2	NA
1930331372098	4	NA	NA	4	3
1930331372099	4	NA	NA	3	3
1930331372100	4	1	NA	4	3
1930331372102	4	4	NA	4	4
1930331372103	4	NA	NA	4	3
1930331372104	4	2	NA	4	3
1930331372105	3	NA	NA	3	1
1930331372106	2	NA	NA	2	NA
1930331372107	3	NA	1	3	2
1930331372108	4	NA	2	4	4
1930331372109	3	0	0	3	2
1930331372111	4	NA	NA	4	3
1930331372112	4	5	NA	5	5
1930331372115	3	NA	NA	3	3
1930331372116	3	NA	NA	3	3
1930331372117	4	NA	2	4	NA
103033201811372 10074	3	NA	1	2	1
103033201811372 10129	2	NA	NA	2	NA
2030331372001	4	NA	NA	4	4
2030331372002	4	4	NA	4	4
2030331372003	4	NA	1	4	3
2030331372004	3	2	NA	3	2
2030331372005	4	4	NA	5	5
2030331372006	3	1	NA	3	2
2030331372007	3	NA	2	3	NA
2030331372008	2	1	NA	3	NA

2030331372009	3	1	NA	3	3
2030331372010	4	NA	5	5	5
2030331372011	2	NA	2	3	1
2030331372012	2	1	NA	3	1
2030331372013	2	2	2	3	NA
2030331372014	3	1	2	3	NA
2030331372015	4	2	NA	4	2
2030331372016	3	NA	1	3	NA
2030331372017	2	1	NA	3	NA
2030331372018	3	NA	NA	3	3
2030331372019	3	3	NA	3	2
2030331372020	2	NA	1	3	NA
2030331372021	2	NA	NA	3	1
2030331372022	3	1	NA	3	2
Average	**3.28235**	**2.28571**	**1.91667**	**3.38095238**	2.83098592
Percentage	**65.65**	**45.72**	**38.34**	**67.62**	56.6

*NA = Not Attempted

Assessment of Course Outcomes through Assignments

Assignment number	Relevant Course Outcomes	Number of students completed assignment	Total Number of students	%percentage
1	CO1, CO2	80	86	93.02
2	CO1, CO2,CO3	82	86	95.35
3	CO1, CO2,CO3,CO5	75	86	87.2
4	CO1,CO3,CO5	84	86	97.68
5	CO1,CO3,CO6	78	86	90.7
6	CO1, CO2, CO5,CO3,CO4,CO6	84	86	97.68

Assessment of Course Outcomes

Course Outcomes	Assessment Tool	Contribution to Programme outcomes in %							Attainment level of course outcomes (%)		Achievement (Goal: 70%) In Yes/No
		PO2	PO3	PO4	PO5	PO6	P07	PO11			
CO1	MSE Q.1	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	76	Yes
	MSE Q.2	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**		
	MSE Q.3	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**		
	MSE Q.4	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**		
	MSE Q.5	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6		
	Assignment 1	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**		
	Assignment 2	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**		
	Assignment 3	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**		
	Assignment 4	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		
	Assignment 5	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**		
	Assignment 6	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		
CO2	MSE Q.1	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	**65.65**	72.5	Yes
	MSE Q.2	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**		
	MSE Q.3	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**		
	MSE Q.5	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6		
	Assignment 1	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**		
	Assignment 2	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**		
	Assignment 3	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**		
	Assignment 4	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		
CO3	MSE Q.2	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	**45.72**	78.9	Yes
	MSE Q.5	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6		

	Assignment 2	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**		
	Assignment 3	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**		
	Assignment 4	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		
	Assignment 5	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**		
CO4	Assignment 6	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	98	Yes
CO5	MSE Q.3	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	73.8	Yes
	MSE Q 4	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**		
	MSE Q 5	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6		
	Assignment 2	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**		
	Assignment 3	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**		
	Assignment 4	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		
CO6	MSE Q.3	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	**38.34**	83.45	Yes
	MSE Q.4	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**	**67.62**		
	Assignment 1	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**	**93.02**		
	Assignment 2	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**	**95.35**		
	Assignment 3	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**	**87.2**		
	Assignment 4	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		
	Assignment 5	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**	**90.7**		
	Assignment 6	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**	**97.68**		