ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

(Approved by A.I.C.T.E, New Delhi & Affiliated to JNTU Anantapur, Anantapuramu)
(Institute Accredited by NAAC, Bangalore) (Institute Accredited by IE (I), Kolkata)

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

MINUTES of 15th BOS

Date & Time
15.10.2022 & 10.00 am

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

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Academic Year 2022-2023

MINUTES OF BOARD OF STUDIES

The meeting of the Board of Studies in Electrical and Electronics Engineering (UG) of the Department of Electrical and Electronics Engineering, AITS, Rajampet held on 15.10.2022 at 10 a.m. to discuss the revision of curriculum and syllabus of B. Tech.

The following members were present for the BoS meeting

S. No.	Name of the Board Member	Designation	Institute/Industry	Role
Internal Members				
1.	Dr. M. Padma Lalitha	Professor	AITS, Rajampet	Chairman
2.	Dr. P. B. Chennaiah	Associate Professor	AITS, Rajampet	Member
3.	Mr. C. Ganesh	Assistant. Professor	AITS, Rajampet	Member
External Members				
4.	Dr. M. Sydulu	Ex. Professor	NIT, Warangal	Academic Expert
5.	Dr. K. Siva Kumar	Associate Professor	IIT, Hyderabad	Academic Expert
6.	Dr. K. Sreenivas	Superintending Engineer	APSPDCL, Nellore	Industry Expert
7.	Mr. P. Amarnath	Application Development Senior Analyst	Accenture, Hyderabad	Alumni

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AGENDA OF THE MEETING

Item No.	Particulars
BoS/2022/EEE/UG/151	Ratification of 14th Board of Studies meeting.
BoS/2022/EEE/UG/152	Ratification of 14th Board of Studies meeting action taken.
BoS/2022/EEE/UG/153	Discussion on stakeholder's feedback on curriculum.
BoS/2022/EEE/UG/154	Approval for changes in syllabus for Open Elective for B. Tech R19 Reg.
BoS/2022/EEE/UG/155	Approval for changes in syllabus for Open Elective for B. Tech R20 Reg.
BoS/2022/EEE/UG/156	Discussion on COs, POs, CO-PO mapping etc.

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MINUTES OF THE MEETING

Dr. M. Padma Lalitha, Professor and Head Department of Electrical & Electronics Engineering, Chairman, BoS initiated the meeting with a warm welcome and thanked them for accepting the invitation to the 15th BoS meeting.

Item No: 1 BoS / 2022 / EEE / UG / 15.1

Ratification of the 14th Board of Studies meeting held on 16.05.2022

The external BoS members have ratified the points discussed in the 14th Board of Studies meeting held on 16/05/2022.

Item No: 2 BoS / 2022 / EEE / UG / 15.2

Ratification of 14th BoS meeting action taken report

The BoS chairperson presented the action taken report on changes made in the course structure of R20 regulation. The copy of revised course structure is given **Annexure-I.**

Item No: 3 BoS / 2022 / EEE / UG / 15.3

Discussion on stakeholder's feedback on curriculum.

The BoS chairperson presented the analysis report of stakeholder's feedback on curriculum. The BoS members noted the same and advised to incorporate the suggestions as per the feasibility. The stakeholder's feedback and action taken are given in **Annexure-II.**

Item No: 4 BoS / 2022 / EEE / UG / 15.4

Approval for changes in syllabus for Open Elective for B. Tech R19 Reg.

The BoS chairperson discussed the changes in syllabus for open elective (Battery Energy Storage Systems) for B. Tech R19 Regulation. The BoS members approved the new syllabus for the above-mentioned course. The table of previous and proposed syllabus is enclosed in **Annexure-III.**

Item No: 5 BoS / 2022 / EEE / UG / 15.5

Approval for changes in syllabus for Open Elective for B. Tech R20 Reg.

The BoS chairperson discussed the changes in syllabus for open elective (Electric Vehicles) for B. Tech R20 Regulation. The BoS members approved the new syllabus.for the above-mentioned course.

The table of previous and proposed syllabus is enclosed in **Annexure-IV**. During the meeting, the following suggestions are given by the BoS members.

The following are the suggestions given by the BOS members.

Suggestions given by Dr. M. Sydulu,

- Incorporate the mathematical model to determine the battery rating and sizing for real time application for EEE Students.

Suggestions given by Dr. K. Siva Kumar,

- Incorporate the DC-DC and DC-AC (PWM) converters for the control of Electric Vehicles.

Item No: 6 BoS / 2022 / EEE / UG & PG / 15.6

Discussion on COs, POs, CO-PO mapping etc.

The BoS chairperson and other members discussed the COs, POs, and CO-PO mapping with the external BoS members. The BoS members approved the CO-PO mapping.

Dr. M. Padma Lalitha
Chairman
Head of the Department
Electrical & Electronics Engineering
Annamacharya Institute of Technology & Sciences
New Boyanapalli, Rajampet - 516 126

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Annexure-I (Action Taken Report - Revised Course Structure)

Semester V (Third year)

Sl. No.	Category	Course Code	Course Title
1	HON	20A2H01	Design of Electrical Machines
		20A2H02	Advanced Electrical Machines
		20A2H03	Optimization Techniques
		20A2H04	Battery Energy Storage System

Semester VI (Third year)

Sl. No.	Category	Course Code	Course Title
2	HON	20A2H05	Electrical & Electronics Instrumentation
		20A2H06	Principles of Embedded System
		20A2H07	Artificial Intelligence and Soft Computing
		20A2H08	Electric Vehicles

Semester VII (Fourth year)

Sl. No.	Category	Course Code	Course Title
3	HON	20A2H09	Advanced Control Theory
		20A2H10	Advanced Power System Protection
		20A2H11	Power System Dynamics &Stability
		20A2H12	AC & DC Micro-Grids

Semester VIII (Fourth year)

Sl. No.	Category	Course Code	Course Title
4	HON	20A2H13	Fundamentals of High Voltage Engineering
		20A2H14	Deregulated Power System
		20A2H15	Applications of Programmable Logic Controller
		20A2H16	Advanced Electric Drives

Any Two from the list of NPTEL courses

Sl. No.	Category	Course Code	Course Title
5	HON	20A2H17	MOOCS-1
		20A2H18	MOOCS-2

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Annexure-II (Stakeholder's Feedback)

The following recommendations have been forwarded from the feedback committee and PAC to the BOS. The resolutions passed are provided point wise below:

S. No.	Decision About	Resolution
1.	Conduction of more no. of workshops/internships on recent technologies.	It has been resolved to conduct more no. of workshops/internships on recent technologies.
2.	Conduction of GATE classes	It has been resolved to conduct GATE classes.
3.	Conduction of more no. of guest lectures by experts from IITs, NITs, and Industry.	It has been resolved to conduct more no. of guest lectures by experts from IITs, NITs, and Industry.
4.	Conduction of more no. of Games/Sports activities	It has been resolved to conduct more no. of Games/Sports activities.
5.	Conduction of more no. of cultural activities	It has been resolved to conduct more no. of cultural activities.
6.	Conduction of more no. of NSS activities	It has been resolved to conduct more no. of NSS activities.
7.	Organizing industrial tours	It has been resolved to conduct industrial tours.

Head of the Department
Electrical & Electronics Engineering
Annamacharya Institute of Technology & Science
New Boyanapalli, Rajampet - 516 126

Annexure-III (BESS Syllabus Comparison)

BESS Previous Syllabus (R19)	BESS Proposed Syllabus (R19)
Unit-I: Introduction to Energy Storage for Power Systems	**Unit-I: Introduction to Energy Storage Systems**
Emerging needs for Electrical Energy Storage -Role of Energy Storage Systems-Applications. Overview of energy storage technologies: Thermal, Mechanical, Chemical, Electrochemical, Electrical-Efficiency of Energy Storage Systems	Batteries: Lead Acid Battery, Nickel based batteries, Sodium based batteries, Lithium based batteries – Li-ion & Li-poly, Metal Air Battery, Zine Chloride battery.
Unit-II: Energy Storage Technologies	**Unit-II: Battery Characteristics**
Storage Types - Components of a Battery Energy Storage Systems (BESS) - Energy Storage System Components -Grid Connection for Utility-Scale BESS Projects -Battery Chemistry Types -Lead–Acid (PBA) Battery - Nickel–Cadmium (Ni–Cd) Battery-Lithium-Ion (Li-Ion) Battery.	Cells and Batteries- conversion of chemical energy to electrical energy- Battery Specifications: Variables to characterize battery operating conditions and Specifications to characterize battery nominal and maximum characteristics; Efficiency of batteries;
Unit-III: Grid Applications of Battery Energy Storage Systems	**Unit-III: Battery Parameters**
Scoping of BESS Use Cases - General Grid Applications of BESS -Technical Requirements - Round-Trip Efficiency - Response Time - Lifetime and Cycling - Sizing - Operation and Maintenance.	Electrical parameters- Heat generation- Battery design- Performance criteria for Electric vehicles batteries- Vehicle propulsion factors- Power and energy requirements of batteries Meeting battery performance criteria- setting new targets for battery performance.
Unit-IV: Challenges and Risks	**Unit-IV: Battery Management System**
Grid Tariff Applications and Licensing Issues -Battery Safety - Challenges of Reducing Carbon Emissions - Battery Recycling and Reuse Risks -Examples of Battery Reuse and Recycling - Reuse of Electric Vehicle Batteries for Energy Storage - Recycling Process.	Battery thermal management system, Battery Management System: Definition, Parts: Power Module, Battery, DC/DC Converter, load, communication channel, Battery Pack Safety, Battery Standards & Tests.
Unit-V: Policy Recommendations	**Unit-V: Battery Testing, Disposal & Recycling**
Frequency Regulation - Renewable Integration - Distribution Grids -Transmission Grid– Peak Shaving and Load Leveling - Microgrids	Battery testing, limitations for transport and storage of cells and batteries, Recycling, disposal and second use of batteries. Environment and Human Health impact assessments of batteries, General recycling issues and drivers, methods of recycling of EV batteries

Note: The percentage of syllabus changes is 100% (>20%), this course is treated as new course.

Annexure-IV (EV Syllabus Comparison)

EV Previous Syllabus (R20)	EV Proposed Syllabus (R20)
Unit-I: Introduction to Electric Vehicle (EV)	**Unit-I: Introduction to Electric Vehicles (EV)**
A brief history of Electric vehicles, Types of EV, advantages over conventional vehicles, limitations of EV, impact on environment of EV technology, disposal of battery, cell and hazardous material and their impact on environment.	Introduction to EV system, History of EV - Development towards 21st Century, Components of EV System – EV Advantages – Types–EV market - Electric Vehicles for the future.
Unit-II: Power Management and Energy Sources of EV	**Unit-II: Electric Vehicle Mechanics**
Power and Energy management strategies and its general architecture of EV, various battery sources, energy storage, battery-based energy storage and simplified models of battery, Battery Management Systems (BMS), fuel cells.	Road way fundamentals, law of motion, vehicle kinetic– Propulsion Power - Velocity and Acceleration - Tractive Power– Energy Consumption Energy Consumption- Electric Vehicle drivetrain.
Unit-III: Power Electronics in EV	**Unit-III: Energy Sources**
Introduction, various power electronics converter topologies and its comparisons, Control of converter operations in EV, battery chargers used in EV.	Electric vehicle power source - Battery Basics - Lead-Acid Battery- Nickel-Cadmium Battery- Li-Ion Battery- capacity, state of charge and discharge, specific energy, specific power, Rag-one plot. Alternative Energy Sources- Fuel Cells- Supercapacitors etc.
Unit-IV: DC and AC Machines & Drives in EV	**Unit-IV: EV Motors**
Various types of motors, selection and size of motors, Induction motor drives and control characteristics, Permanent magnet motor drives and characteristics, Brushed & Brushless DC motor drive and characteristics, switched reluctance motors and characteristics.	Motor Ratings-sizing, selection of EV motors- Types of EV motors-overview (speed- torque characterizes) of Three-Phase induction Motor - BLDC and Switched reluctance motor.
Unit-V: Design Considerations of EV	**Unit-V: EV Converters**
Design parameters of batteries, ultra-capacitors and fuel cells, aerodynamic considerations, calculation of the rolling resistance and the grade resistance, calculation of the acceleration force, total tractive effort, torque required on the drive wheel, transmission efficiency.	Introduction to Electrical Vehicle converters, AC-DC, AC-AC, DC-DC converter and DC-AC converters.

Note: The percentage of syllabus changes is 100% (>20%), this course is treated as new course.

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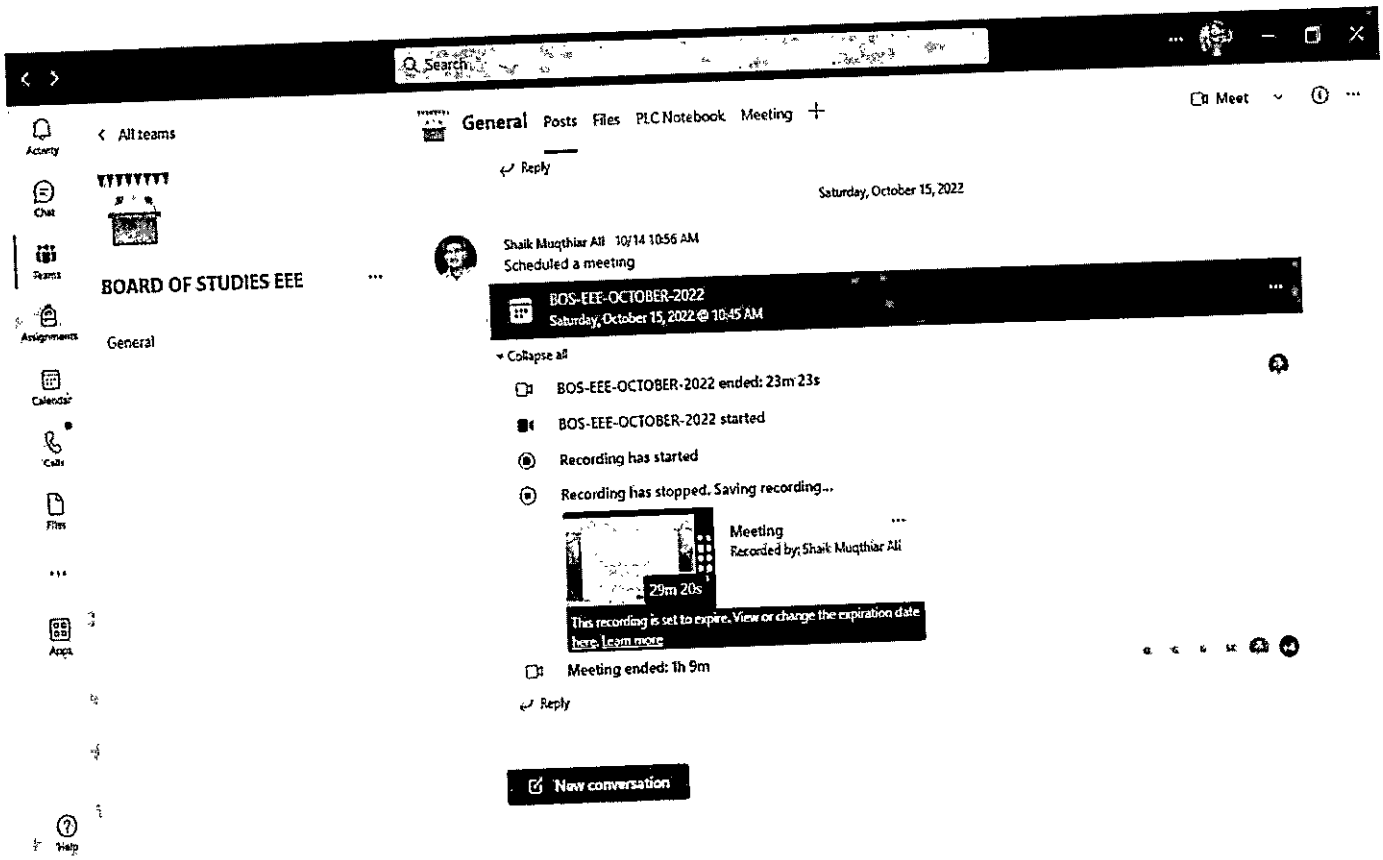
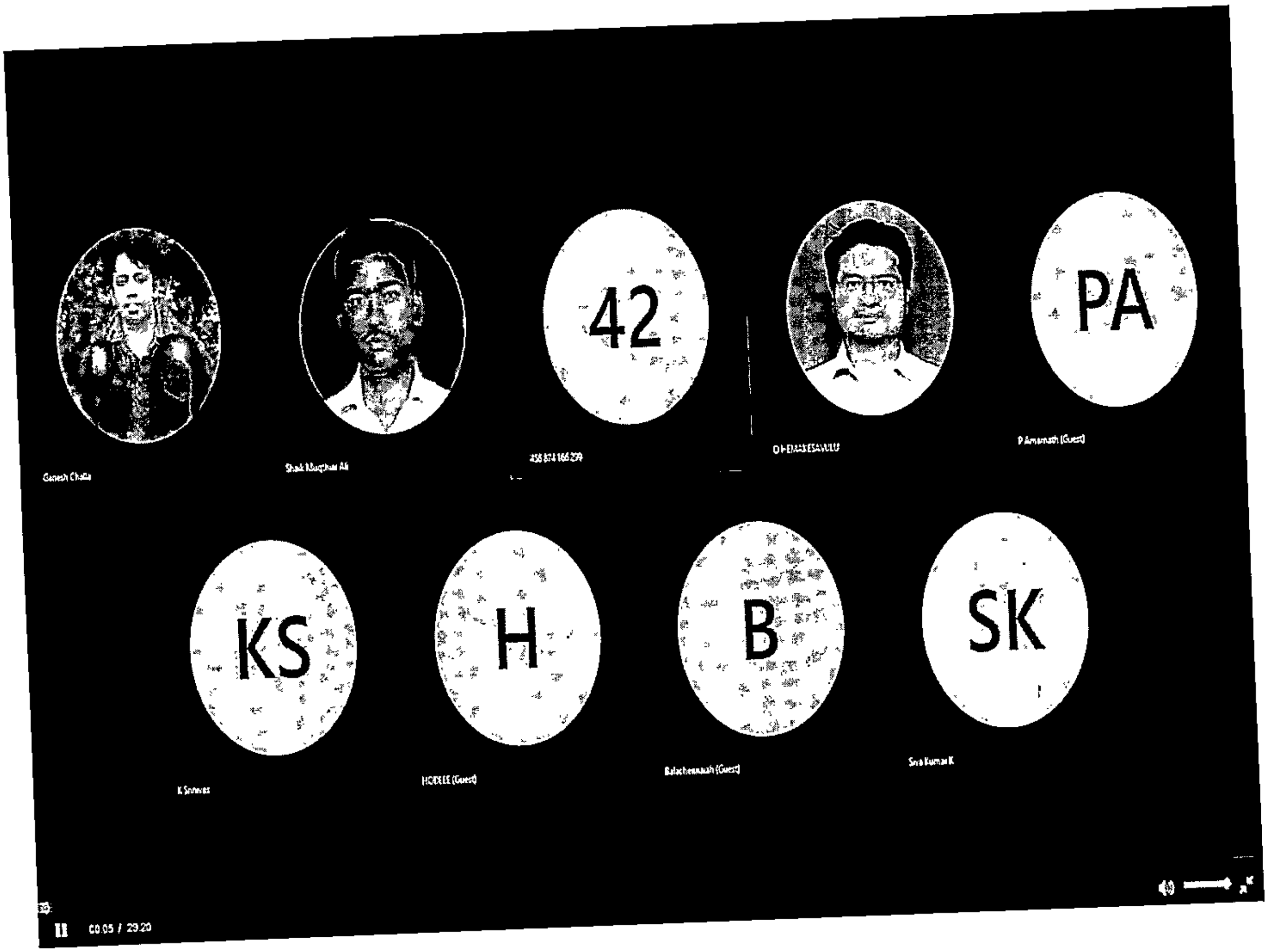
Signature of the Board Members

S.No.	Name of the Board Member	Signature
1.	Dr. M. Padma Lalitha	CPL
2.	Dr. P. B. Chennaiah	P-B-C
3.	Mr. C. Ganesh	G
4.	Dr. M. Sydulu	Attended Through online
5.	Dr. K. Siva Kumar	〃
6.	Dr. K. Sreenivas	〃
7.	Mr. P. Amarnath	〃

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES: RAJAMPET
(AUTONOMOUS)
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

15th BOARD OF STUDIES (R20) MEETING HELD ON 15/10/2022

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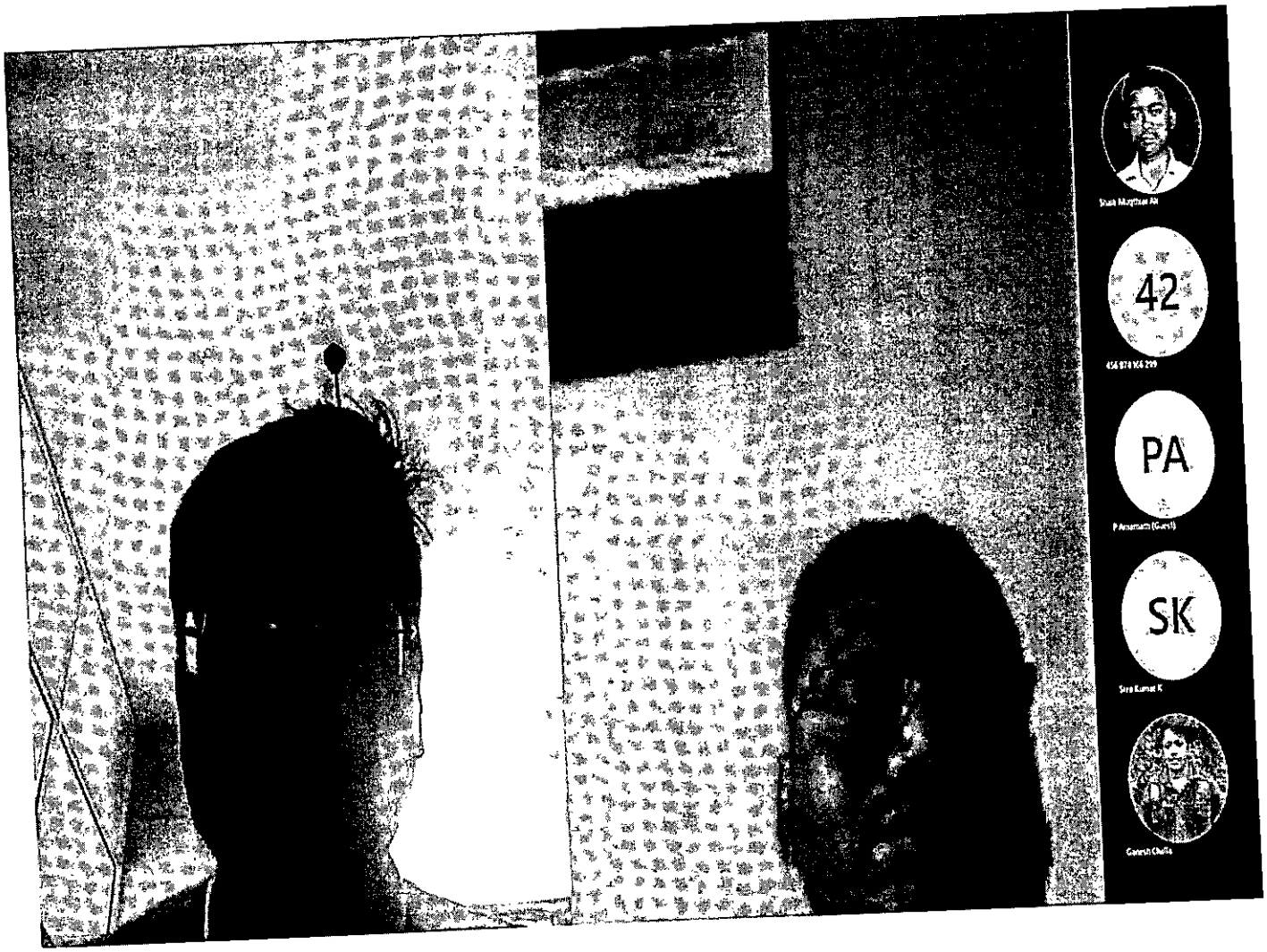
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