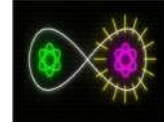


Online Two Days Workshop
On



“Quantum Computing and Communications : New Paradigm”

On the view of “DigitALL: Innovation & Technology for Gender Equality”
International Women’s Day Week 2023 Celebration

28th February 2023 & 1st March 2023

Organizing by

Faculty of Engineering & Technology – Exclusively for Women
Sharnbasva University, Kalaburagi, Karnataka India

In Association with

**IEEE Women in Engineering Affinity Group, IEEE Bangalore
Section**



**Sharnbasveshwar Institutions Campus,
Kalaburagi -585102, Karnataka, India**



Phone/Fax No. : 08472 – 277852, 277853, 277854
Website : www.sharnbasvauniversity.edu.in

Title of the Event	Online Two Days Workshop On “Quantum Computing and Communications: New Paradigm”
Date of Activity held	28th February 2023 & 1st March 2023
Time of Activity	10:00a.m & 2:00p.m
Mode of Activity	Online – GoToMeeting Video Conference Platform
Resource Person	Dr. S. Manjula Gandhi & Dr. S. Gayathri Devi
Professional details of Resource Person	Dr. S. Manjula Gandhi Associate Professor Department of Computing Coimbatore Institute of Technology Coimbatore, Tamil Nadu, India
	Dr. S. Gayathri Devi Assistant Professor Department of Computing Coimbatore Institute of Technology Coimbatore, Tamil Nadu, India
Program/Course/ Class	UG & PG Students and Faculty Members of All Programs of our University.
Number of PG Students/Research Scholars and Faculty Members attended	170 Participants.
Convenor	Dr. Lakshmi Maka, Dean, Sharnbasva University IEEE WIE Student Branch Mentor and Faculty Advisor
Co-Convenors	Prof. Shivganga Patil Chairman, Dept of ECE, FETW, Sharnbasva University.
Activity In charge	Dr. Asharani Patil Associate Professor, Dept. of Electronics & communication Engg., Faculty of Engineering & Technology – Exclusively for Women., Sharnbasva University, Kalaburagi, Karnataka, India.
Aim of the Event	The aim of this workshop is to introduce participants to the fundamental principles, emerging technologies, and future potential of quantum computing and quantum communications. It seeks to explore how quantum mechanics is revolutionizing computation, data security, and communication systems, and to provide insights into the challenges and opportunities within this rapidly evolving paradigm.

100+ Years of Sharnbasva History inscribed in the journey service to the field of education Centenary Celebrated Sharnbasveshwar Vidya Vardhak Sangha's    ಶರಣಬಸವ ವಿಶ್ವವಿದ್ಯಾಲಯ Sharnbasva University Kalaburagi - 585103, Karnataka - India ಕಲಬುರಗಿ 585 103 ಕರ್ನಾಟಕ - ಇಂಡಿಯಾ Phone / Fax No. 08472-277852, 277853, 277854, 277855 www.sharnbasvauniversity.edu.in - email : Sharnbasvauniversity@gmail.com UGC Status: Letter No. F.3-29/2017(CPP-4PU), Dated 20 Dec. 2017. Enlisted by the University Grants Commission, New Delhi, in the list of Private Universities in India. A Private University enacted by Govt. of Karnataka as "Sharnbasva University Act, 2012" Karnataka Act No. 17 of 2013. Notification No. ED 144 URC 2016 dated 29/07/2017  	
Dr. Niranjan V. Nistya M.Sc., Ph.D. Vice-Chancellor Sri N.S. Devarkar B.Sc., M.A., U.G.S. Pro Vice-Chancellor Dr. V. D. Mytri M.Sc., Ph.D. Pro Vice-Chancellor Dr. Anilkumar Bidve B.Sc., Ph.D. Registrar : Cell : 9362910465 Dr. Basavaraj S. Mathapalli M.Sc., Ph.D. Registrar (Ext) : Cell : 9448650597 Dr. Lakshmi Patil M.Sc., Ph.D. Dean : Cell : 9362910468 Prof. Kiran Meka M.Sc., Ph.D. Finance Officer : Cell : 9832344958 Faculty of Engg. & Tech. B.Tech. 1. Electronics & Comm. Engineering 2. Electrical & Electronics Engineering 3. Computer Science & Engineering 4. Civil Engineering 5. Mechanical Engineering 6. Energy Engineering 7. Artificial Intelligence (AI) & Data Science M.Tech. 1. Computer Science & Engineering 2. Computer Network & Engineering 3. Digital Electronics 4. VLSI & Embedded Systems 5. Machine Design Engineering 6. Structural Engineering 7. Artificial Intelligence & Data Science Faculty of Engg & Tech (Exclusively for Women) B.Tech. 1. Electronics & Comm. Engineering 2. Electrical & Electronics Engineering 3. Computer Science & Engineering 4. Civil Engineering 5. Artificial Intelligence & Machine Learning M.Tech. 1. Computer Science & Engineering 2. Digital Comm. & Network Faculty of Architecture 1. B. Arch Bachelor of Architecture Faculty of Business Studies 1. BBA- HR, Marketing, Finance 2. BBA- Tourism & Travel Mgmt. 3. BBA Logistics 4. MBA- HR, Marketing, Finance 5. MBA-Hospital Management 6. MBA- Tourism & Travel Mgmt. 7. M. Com. (Exclusively for Women) 1. MBA-HR, Marketing, Finance 2. BBA-HR, Marketing, Finance 3. BBA-Aviation Services & Air Cargo Faculty of Social Science 1. M.A. Journalism & Mass Comm. Faculty of Science & Tech. 1. M.Sc. Physics 2. M.Sc. Maths 3. M.Sc. Zoology 4. M.Sc. Botany Faculty of Computer Application 1. MCA 2. BCA (Exclusively for Women) 1. BCA Faculty of Fine Art 1. M.A. Visual Arts Faculty of Music 1. M.A. Music Faculty of Languages 1. M.A. Kannada 2. M.A. English Proposed Programmes 1. M.Sc. Data Science 2. M.Sc.M.A. Yoga 3. M.A. Sanskrit	Ref No: SUK/ Acad/22-23/171 Date: 22/02/2023 To, Dr. S. Manjula Gandhi Associate Professor Department of Computing Coimbatore Institute of Technology, Coimbatore, Tamil Nadu, India Subject: Invitation as Resource Person for the FDP Program. Respected Madam, With the reference to the above cited subject, Department of Electronics & Communication Engg., Faculty of Engineering & Technology – Exclusively for Women, Sharnbasva University, Kalaburagi, Karnataka is organizing Online Two Days Faculty Development Program on "Quantum Computing and Communications : New Paradigm" on 28th February 2023 & 1st March 2023 on the view of "DigitALL : Innovation & Technology for Gender Equality" International Women's Day Week 2023 Celebration under IEEE Women in Engineering Affinity Group Chapter, IEEE Bangalore Section of our University. In this regards, I take the privilege for inviting you as a resource person to deliver a presentation on Quantum Computing and Communications on 1st March 2023. Your honorary presence and valuable presentation will ignite the program. We sincerely hope that you will honor by accepting our invitation. Thanking you,  DEAN

Dr. S. Gayathri Devi

Assistant Professor

Department of Computing

Coimbatore Institute of Technology

Coimbatore, Tamil Nadu, India

100 Years of Glorious History



Sharnbasva University

Centenary Celebrated Sharnbasveshwar Vidya Vardhak Sangha's



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Sharnbasva University

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UGC Status: Letter No. F.B.29/2017(CPP-UPU), Dated 20 Dec. 2017. Enlisted by the University Grants Commission, New Delhi, in the list of Private Universities in India. A Private University enacted by Govt. of Karnataka as "Sharnbasva University Act, 2017" Karnataka Act No. 17 of 2013. Notification No. ED 144 URC 2016 dated 29/07/2017

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 Vice-Chancellor

Sri N.S. Devankar Ph.D., M.A., LL.B.
 Pro Vice-Chancellor

Dr. V. D. Myrthi Ph.D., M.Tech.
 Pro Vice-Chancellor

Dr. Anilkumar Bidve Ph.D., Ph.D.
 Registrar : Cell: 936290595

Dr. Basavaraj S. Mathapell M.Tech., Ph.D.
 Registrar (Ext) : Cell : 944895097

Dr. Lakshmi Patti Ph.D., M.Tech.
 Dean : Cell: 936290598

Prof. Kiran Malik Ph.D., Ph.D.
 Finance Officer : Cell : 962234956

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 1. M.A. Kannada 2. M.A. English
Proposed Programmes
 1. M.Sc. Data Science
 2. M.Sc. M.A. Yoga
 3. M.A. Sanskrit

Ref No: SUR/ACad/22-23/1740 Date: 20/02/2023

To,

Dr. S. Gayathri Devi
 Assistant Professor
 Department of Computing
 Coimbatore Institute of Technology,
 Coimbatore, Tamil Nadu, India

Subject: Invitation as Resource Person for the FDP Program.

Respected Madam,

With the reference to the above cited subject, Department of Electronics & Communication Engg., Faculty of Engineering & Technology – Exclusively for Women, Sharnbasva University, Kalaburagi, Karnataka is organizing **Online Two Days Faculty Development Program on "Quantum Computing and Communications : New Paradigm"** on **28th February 2023 & 1st March 2023** on the view of "DigitALL : Innovation & Technology for Gender Equality" - International Women's Day Week 2023 Celebration under IEEE Women in Engineering Affinity Group Chapter, IEEE Bangalore Section of our University.

In this regards, I take the privilege for inviting you as a resource person to deliver a presentation on Quantum Computing and Communications on 28th February 2023. Your honorary presence and valuable presentation will ignite the program.

We sincerely hope that you will honor by accepting our invitation.

Thanking you,

Musasa
 DEAN

Registration

All the participants were made to free registration. By filling the Google Form on or before 27th February 2023 before 3:00 p.m.

Registration Link : <https://forms.gle/dXpj6k4YtKAVtVwK6>

Schedule of the Workshop

ONLINE MODE – GoToMeeting Online Conference Platform
28th February 2023 & 1st March 2023

Schedule of Workshop

Day 1 : Tuesday : 28th February 2023

Timing	Topics to be covered	
10:00a.m - 10:30 a.m	Inaugural of workshop	
10:30a.m - 12:30p.m	Session – I : Dr. S.Gayathri Devi	
	Topics covered :	Introduction to Quantum computing
		Single qubit quantum gates
		Working demo using IBM Qiskit
12:30p.m - 2:00p.m	Lunch Break	
2:00p.m - 4:00p.m	Session – II : Dr. S.Gayathri Devi	
	Topics covered :	Multi qubit quantum gates
		IBM Qiskit simulators
		Working demo using IBM Qiskit
4:00p.m	Discussion with Feedback - I	

Day 2 : Wednesday : 1st March 2023

10:00a.m - 12:00 p.m	Session – III : Dr. S.Manjula Gandhi	
	Topics Covered	Working with Quantum Circuits
		Quantum Entanglement
		Working demo using IBM Qiskit
12:30p.m - 2:00p.m	Lunch Break	
2:00p.m - 4:00p.m	Session – IV : Dr. S.Manjula Gandhi	
	Topics Covered	Quantum Teleportation
		Working demo using IBM Qiskit
4:00p.m - 4:30p.m	Discussion with Valedictory function	
	Feedback - II	

Inaugural

Inaugural session was head by Registrar Sir and Dean of our Sharnbasva University

AGENDA

1. Welcome Speech
2. Lightning of Lamp by the Dignitaries Digitally
3. Brief on Workshop.
4. Introduction of Resource Person – 1
5. Introduction of Resource Person – 1
6. Formal Welcome to both Resource Person
7. Warm talk by our Dean Madam
8. Then start with Session.

Centenary Celebrated Sharnbasveshwar Vidya Vardhaka Sangha's

ಶರಣಬಸವ ವಿಶ್ವವಿದ್ಯಾಲಯ
Sharnbasva University

(Under the aegis of Centenary Celebrated Sharnbasveshwar Vidya Vardhaka Sangha)
Kalaburagi - 585 103 Karnataka, India

Invitation for Online Two Days Workshop on

"Quantum Computing and Communications: New Paradigm"

28th February 2023 & 1st March 2023

On the view of "DigitALL: Innovation & Technology for Gender Equality" International Women's Day Week 2023 Celebration

in association with IEEE WIE Affinity Group Bangalore Section, IEEE Bangalore Section

In the Divine Presence & benign blessings of Vidya Bhandari

Poojya Dr. Sharnbaswappa Appaji
Mahadasoha Peethadhipathi, Sharnbasveshwar Samsthana, Kalaburagi
President, Sharnbasveshwar Vidya Vardhak Sangha, Kalaburagi
Chancellor, Sharnbasva University, Kalaburagi
Trustee, Poojya Dr. Sharnbaswappa Appa Family trust, Sharnbasveshwar Samsthan, Kalaburagi

Matoshree Dr. Dakshayini S. Appa
Chairperson, Sharnabasveshwar Vidya Vardhaka Sangha
Member, Board of Governor, Sharnbasva University, Kalaburagi
Trustee, Poojya Dr. Sharnbaswappa Appa Family trust, Sharnbasveshwar Samsthan, Kalaburagi

Poojya Chi. Doddappa Appaji
9th Mahadasoha Peethadhipati, Sharnbasveshwar Samsthana, Kalaburagi
Trustee, Poojya Dr. Sharnbaswappa Appa Family trust, Sharnbasveshwar Samsthan, Kalaburagi

Resource Person

Dr. S. Manjula Gandhi
Associate Professor Dept. of Computing
Coimbatore Institute of Technology
Coimbatore, Tamil Nadu, India

Dr. S. Gayathri Devi
Assistant Professor Dept. of Computing
Coimbatore Institute of Technology
Coimbatore, Tamil Nadu, India

Sri N. S. Devarkal
Pro-Vice-Chancellor
Sharnbasva University, Kalaburagi

Dr. Basavaraj S. Mathpati
Registrar (Evaluation)
Sharnbasva University, Kalaburagi

Dr. V. D. Mytri
Pro-Vice-Chancellor
Sharnbasva University, Kalaburagi

Dr. Lakshmi Patil Maka
Dean
Sharnbasva University, Kalaburagi

Dr. Anilkumar Bidve
Registrar
Sharnbasva University, Kalaburagi

Prof. Kiran Maka
Finance Officer
Sharnbasva University, Kalaburagi

Preside over by
Dr. Niranjana V. Nisty
Vice Chancellor, Sharnbasva University, Kalaburagi

IEEE WIE Coordinator
Dr. Asharani Patil
Dept. of ECE, FETW, Sharnbasva University

Organized by
Dept. of Electronics & Communication Engineering
Faculty of Engineering & Technology (Exclusively for Women)

Registration Link: <https://forms.gle/dXpj6k4YtKAVtVwK6>
Online workshop platform : Go to Meeting

All are cordially invited
Pro Vice-Chancellor's, Registrar, Registrar(Eval), Dean,
Finance Officer, Dean of Faculty, Chairpersons, Staff & Students

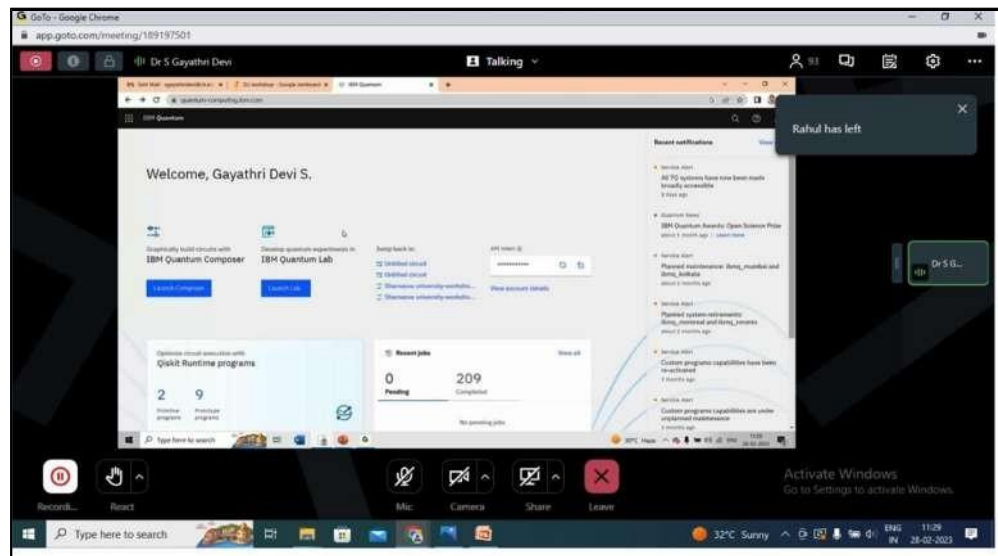
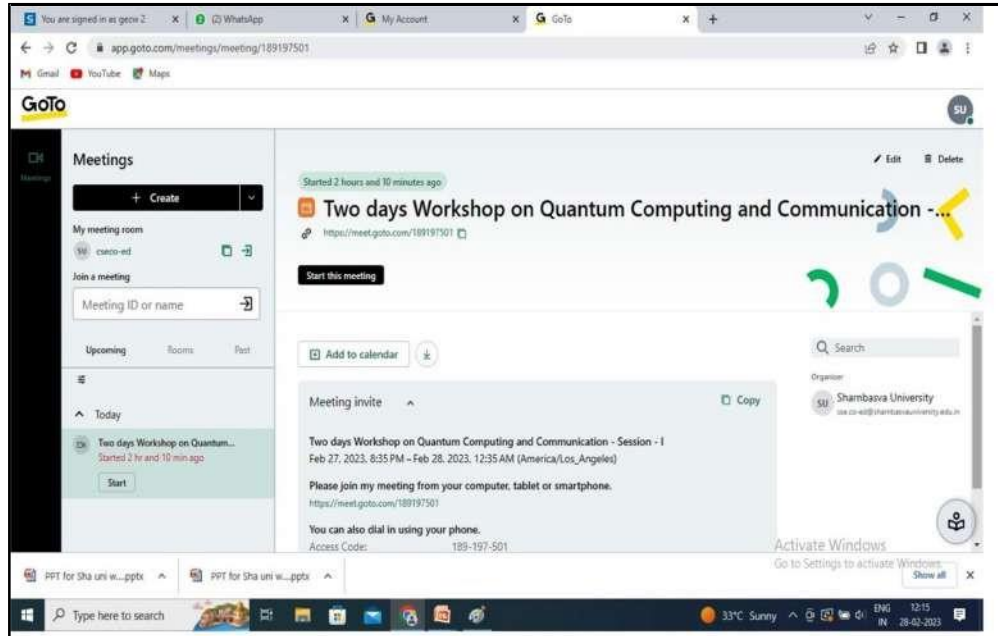
Day – I
Session – I
10:15a.m to 12:00 Noon

Session by Resource Person –

Two days' Workshop on Quantum Computing and Communication - Session - I
Feb 27, 2023, 8:35 PM – Feb 28, 2023, 12:35 AM
(America/Los_Angeles)

Please join my meeting from your computer, tablet or smartphone.
<https://meet.goto.com/189197501>

Dr. S. Gayathri Devi	You can also dial in using your phone. Access Code: 189-197-501 United States: +1 (646) 749-3122 - One-touch: tel:+16467493122,,189197501# Get the app now and be ready when your first meeting starts: https://meet.goto.com/install
	<u>Introduction to Quantum Computing</u> Quantum computing is generally viewed as a field of study centered on developing computer technology based on the principles of quantum theory — the area of physics that explains how matter and energy behave at the atomic and subatomic level. Designing these quantum systems to interact with each- other in specific ways, while engineering unwanted interactions with the environment out (the DiVincenzo criteria) is the general approach to developing quantum computers at scale. Quantum computing is a unique technology because it isn't built on bits that are binary in nature, meaning that they're either zero or one. Instead, the technology is based on qubits. These are two-state quantum mechanical systems that can be part zero and part one at the same time. The quantum property of "superposition" when combined with "entanglement" allows N qubits to act as a group rather than exist in isolation, and therefore achieve exponentially higher information density (2^N) than the information density of a classical computer (N). Although quantum computers have a significant performance advantage, system fidelity remains a weak point. Qubits are highly susceptible to disturbances in their environment, making them prone to error. Correcting these errors requires redundant qubits for error correction and extensive correction codes, however useful applications of so-called Noisy Intermediate Scale Quantum devices, or "NISQ's" is proceeding very rapidly. Improving the fidelity of qubit operations is key to increasing the number of gates and the usefulness of quantum algorithms, as well as for implementing error correction schemes with reasonable qubit overhead



**Contd. Session – I :
Single-Qubit Gates**

Single-Qubit Gates Classical Unary Logic Gates

Alright! At this point, we've talked about what a qubit is, and we've talked about the Bloch Sphere which is the standard way to visualize qubits. Let's talk a bit about quantum computers, how they calculate things with qubits.

In classical computers, we use logic gates as the fundamental

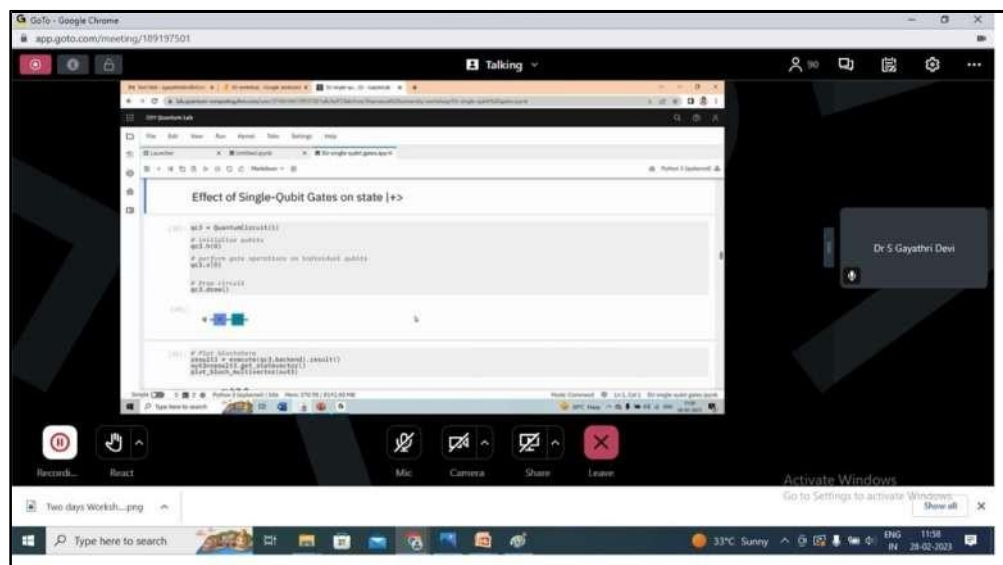
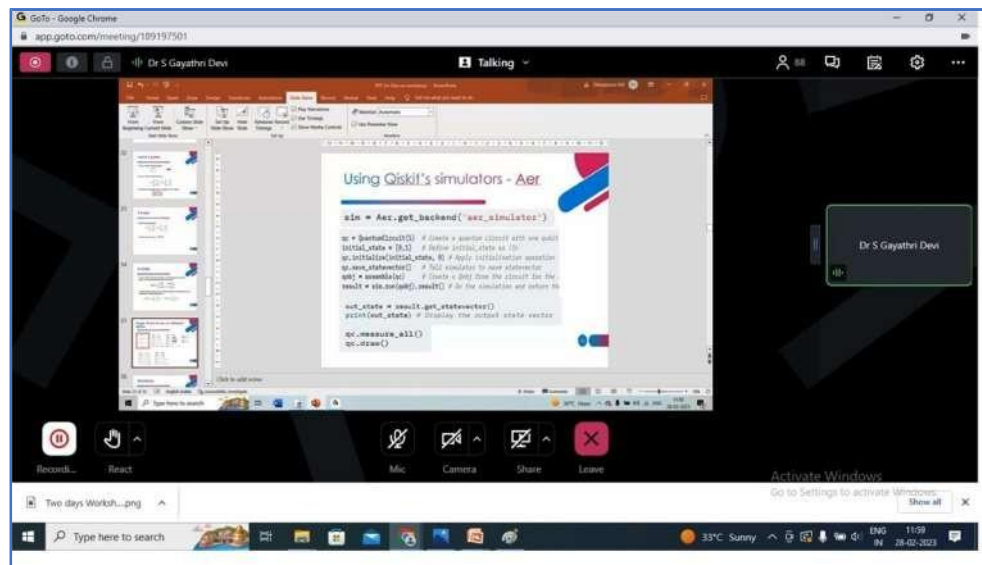
structures that interact with input bits to produce output bits. Most of the time, we think of these input and output bits as different physical bits. We had four unary gates (gates that only take one bit as input):

Clear, which always sets the output to 0

Mark, which always sets the output to 1

Identity, which sets the output to whatever the input was

Negate (NOT), which sets the output to the opposite of the input



Day -I
Session - II
2:00p.m to 4:00 p.m
Session by Resource
Person –
Dr. S. Gayathri Devi

Two days Workshop on Quantum Computing and Communication - Session - II
Feb 28, 2023, 12:00 – 4:00 AM (America/Los_Angeles)

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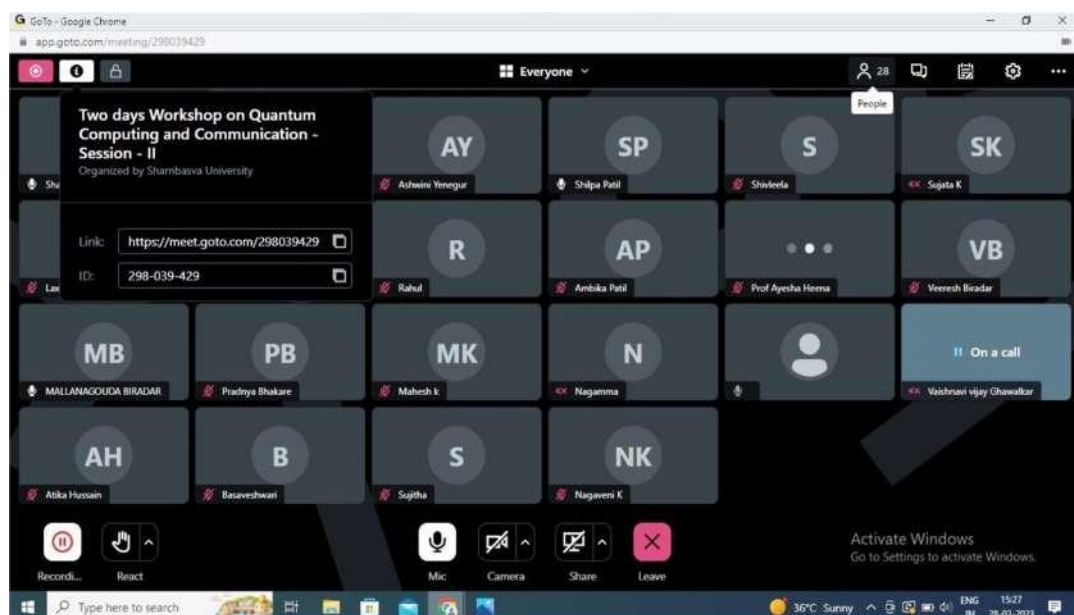
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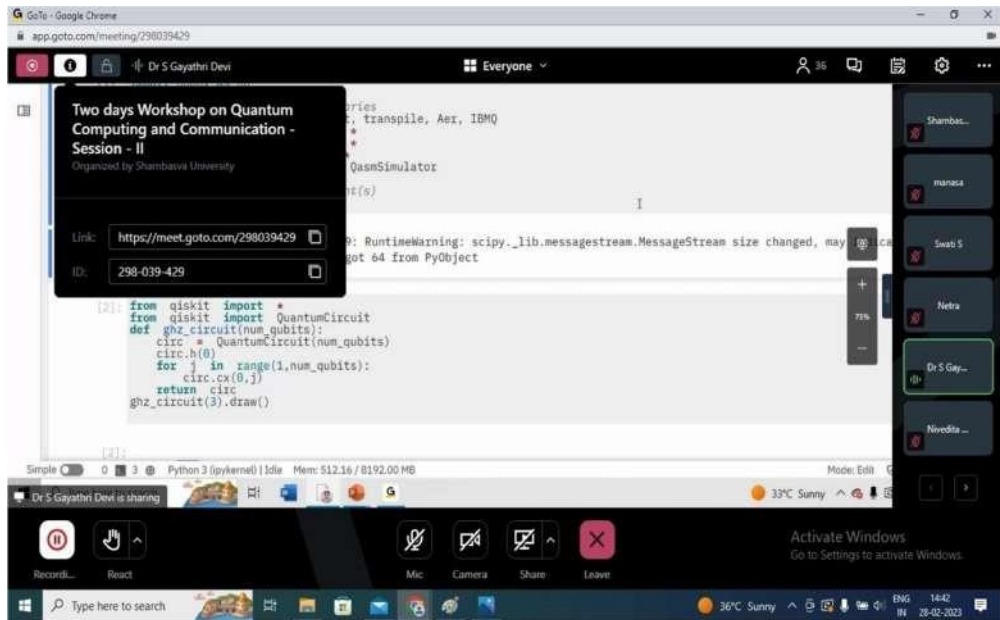
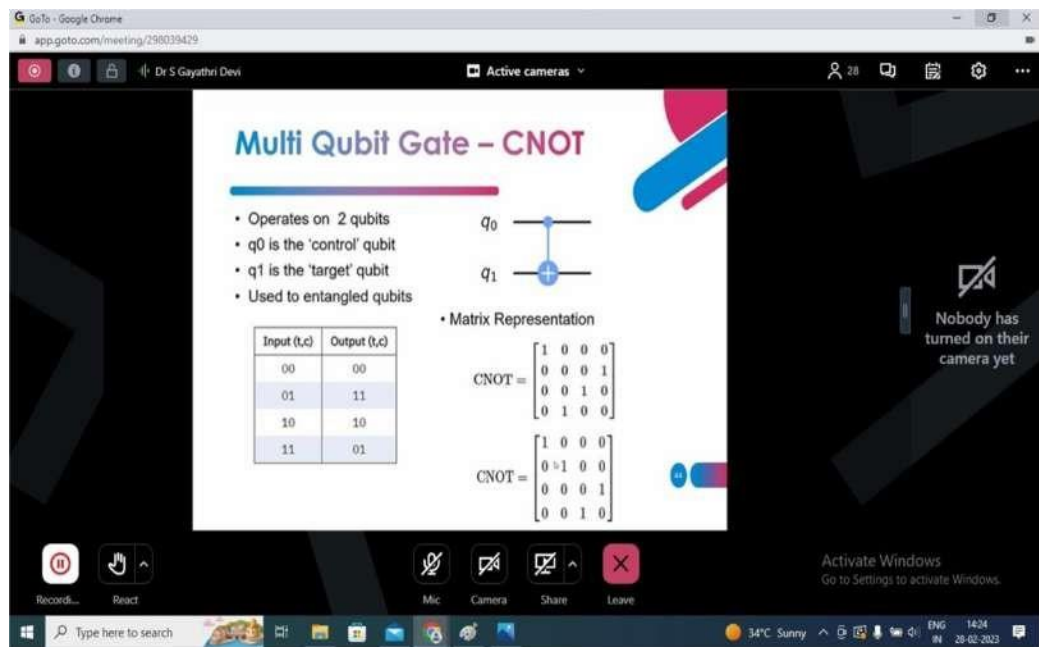
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Multi Qubits and its Simulation

Single-qubit gates, even applied to registers, still only affect one qubit. These gates can be thought of like functions that only take one qubit in their input parameters. They may have more than one overall parameter, such as the arbitrary rotation gates, but they only have one parameter that is a qubit. In this section, we're going to look at gates that take more than one qubit in their input. The simplest multi-qubit gate is called the SWAP gate. It takes in two qubits and switches their states - that is, it puts the first qubit in the state of the second qubit, and vice-versa. The SWAP gate has this matrix.



Queries and
Feedback – Day - I

Few questionnaires and queries were made.

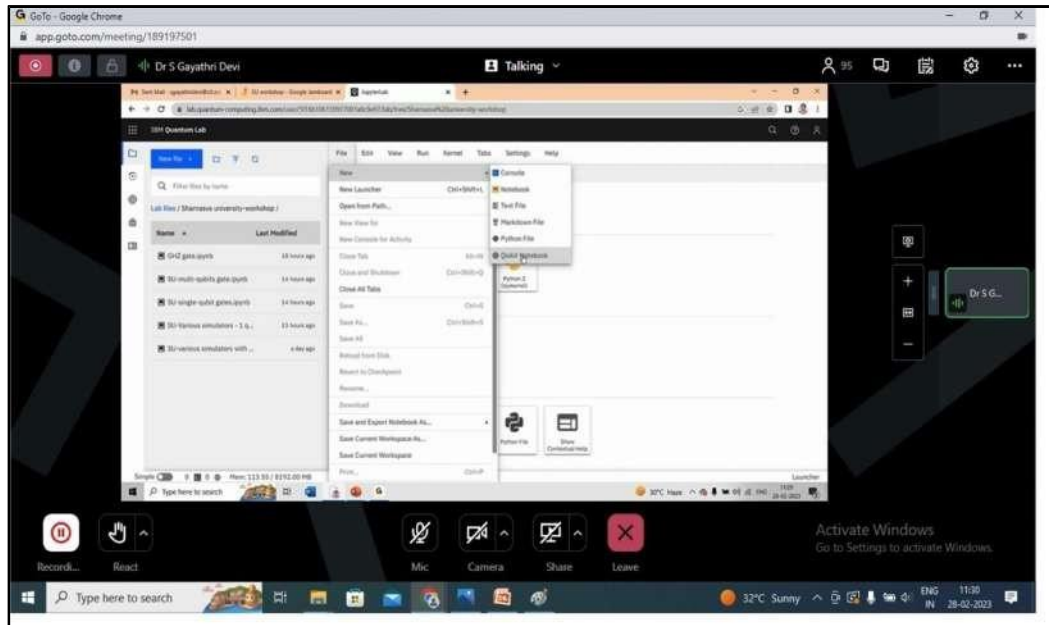
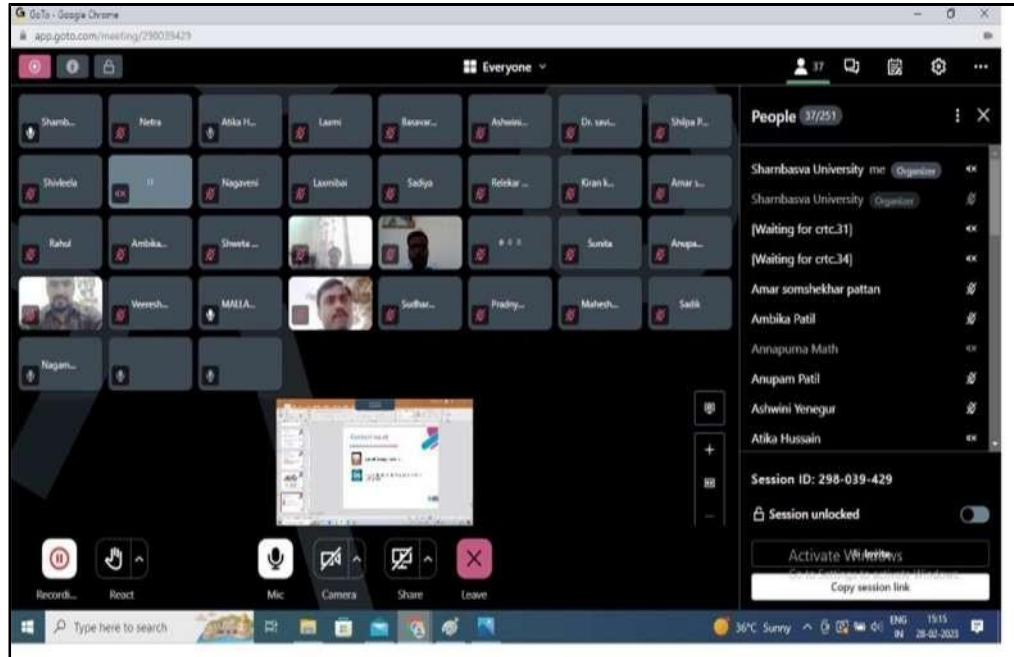
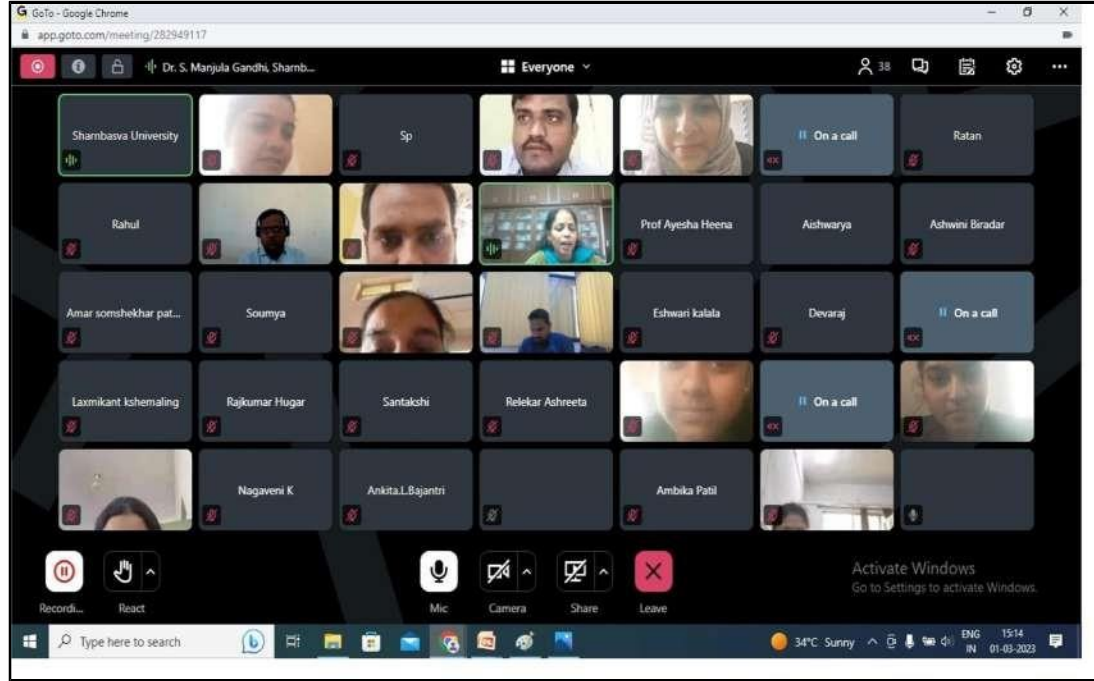


Photo Session Day – I



**Feedback Link –
Day – I**

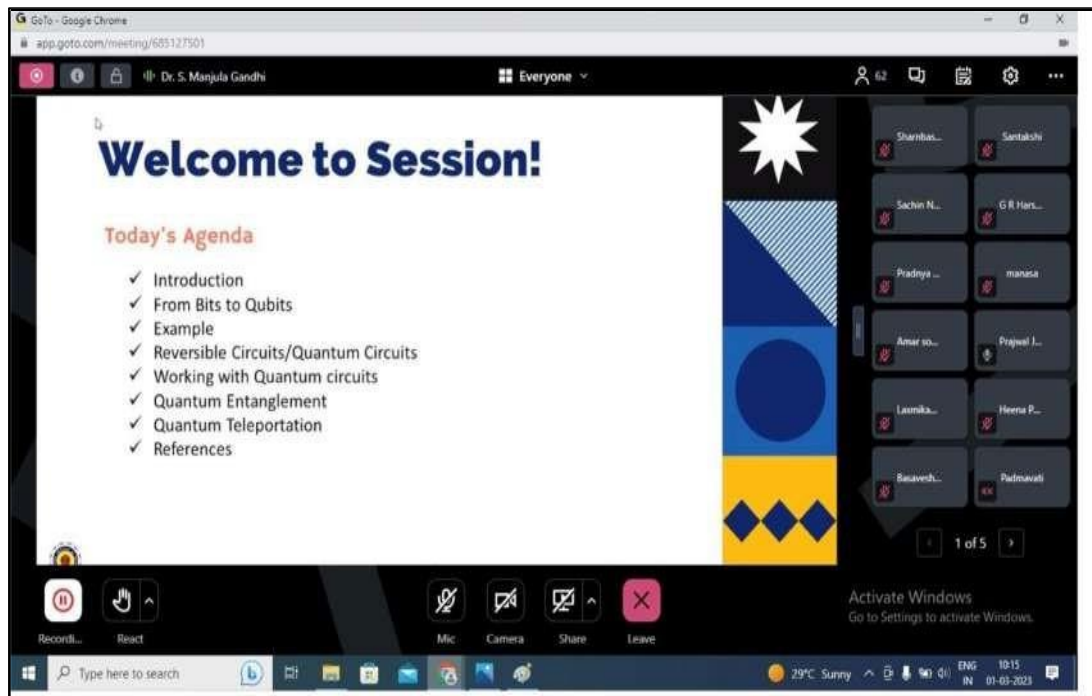
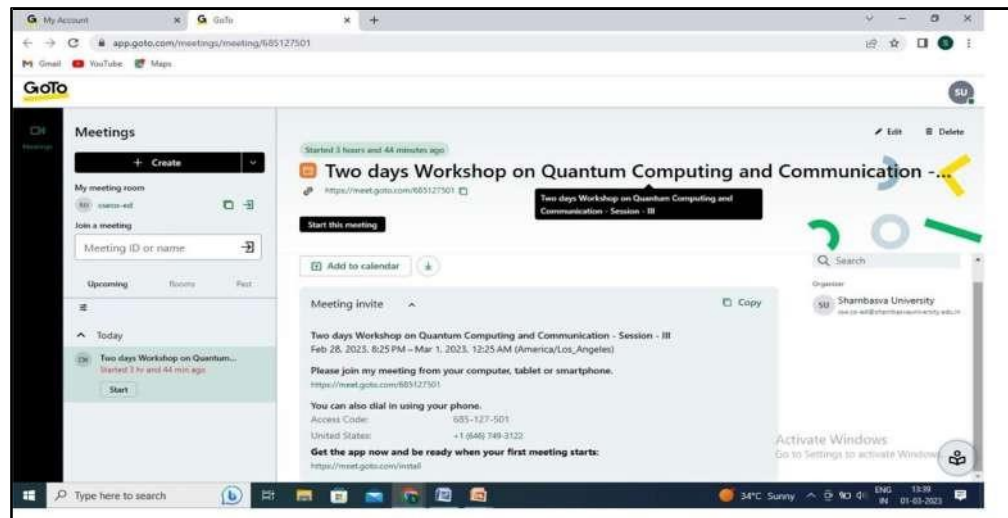
<https://docs.google.com/forms/d/1XHbEDHJJHk01hD3IXGxrCJkfpz5ZyS-K0aPJkX6-IOW/edit>

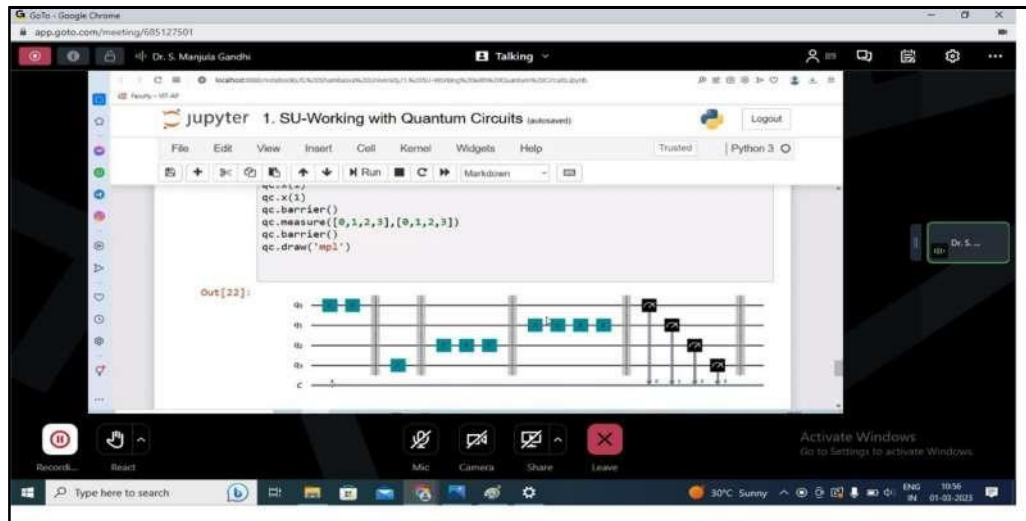
145 Responses

	Feedback form for two days online workshop asharanispatti@gmail.com (not shared) Switch account Email Id Your answer Name Your answer Organization Your answer How satisfied were you with the work shop? Choose Would you attend this workshop in future? ☐ yes ☐ No How satisfied were you with the workshop speakers? Choose Any suggestions? Your answer Submit Clear form Never submit passwords through Google Forms. This content is neither created nor endorsed by Google. Report Abuse · Terms of Service · Privacy Policy Google Forms
Day – II Session – III	Two days' Workshop on Quantum Computing and Communication - Session - III

10:00a.m to 12:00 Noon Resource Person – Dr. S. Manjula Gandhi	Feb 28, 2023, 8:25 PM – Mar 1, 2023, 12:25 AM (America/Los_Angeles) Please join my meeting from your computer, tablet or smartphone. https://meet.goto.com/685127501 You can also dial in using your phone. Access Code: 685-127-501 United States: +1 (646) 749-3122 - One-touch: tel:+16467493122,,685127501# Get the app now and be ready when your first meeting starts: https://meet.goto.com/install
	<u>Working with Quantum Circuits – Quantum Entanglement.</u> Quantum entanglement is a quantum mechanical phenomenon in which the quantum states of two or more objects have to be described with reference to each other, even though the individual objects may be spatially separated Quantum entanglement is at the heart of quantum physics. It offers unique insights into the fundamental principles of our physical world and it provides at the same time the basis of novel communication protocols, which allow efficient communication and computation beyond the capabilities of their classical counterparts. Prominent examples are quantum cryptography, the simultaneous distribution of a cryptographic key that is ultimately secured by the laws of quantum physics, quantum dense coding, a protocol to double the classically allowed capacity of a communication channel by encoding 2 bits of information per bit sent, or quantum teleportation/ the remote transfer of an arbitrary quantum state between distant locations. Further examples include entanglement-assisted classical communication to enhance the communication capacity in a noisy environment or methods to exploit the computational advantages provided by quantum entanglement for communication complexity problems. These quantum communication protocols utilize entanglement as a resource and form the basis for a new emerging quantum

information technology. To achieve quantum communication within a network it is a central task to be able to distribute and manipulate quantum entanglement, in principle up to a global scale. At present, the only suitable system for transmitting information in long-distance quantum communication is photons.





Two days Workshop on Quantum Computing and Communication - Session - IV

Mar 1, 2023, 12:15 – 4:15 AM (America/Los_Angeles)

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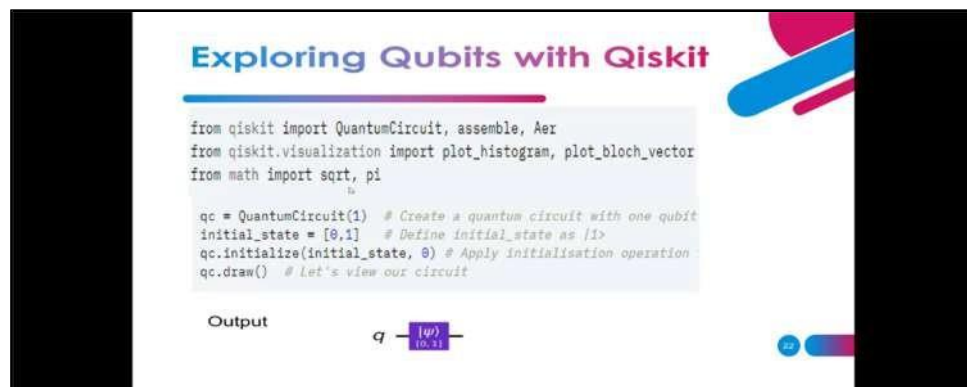
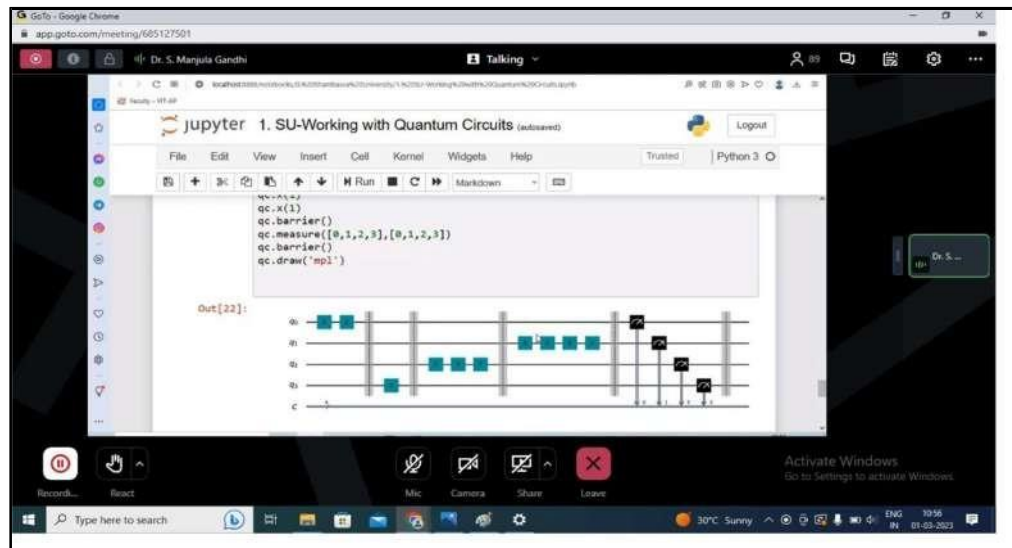
Day – II
Session – IV
2:00p.m to 3:30p.m

Resource Person –
Dr. S. Manjula
Gandhi

Quantum Teleportation & Multi Qubits and its Simulation

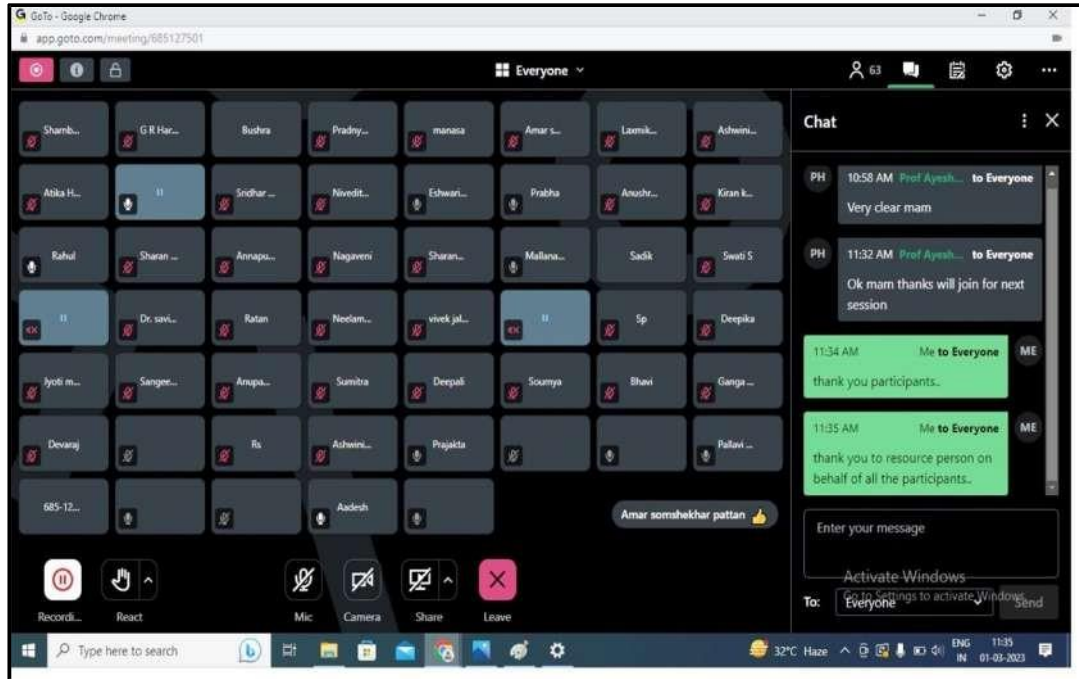
Quantum teleportation: a quantum information protocol by which the unknown quantum state of one particle can be transferred to another distant particle, using a pair of entangled particles, a projective measurement, and exchange of two bits of classical information

Quantum algorithms can be exemplified as quantum circuits, merely comparable to conventional computing. Every qubit may be signified as a line, as the usual bits are, and they can be operated and entangled with each other across the routine of quantum gates, corresponding to logic gates.



Queries and Feedback – Day - II

Few questionnaires' and queries were made.



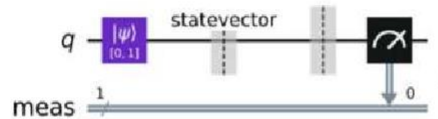
The screenshot shows a Google Meet session with 63 participants. The chat window on the right displays the following messages:

- 10:58 AM Prof Ayesha... to Everyone: Very clear mam
- 11:32 AM Prof Ayesha... to Everyone: Ok mam thanks will join for next session
- 11:34 AM Me to Everyone: thank you participants...
- 11:35 AM Me to Everyone: thank you to resource person on behalf of all the participants.

The bottom of the screen shows the Windows taskbar with the date 01-03-2023 and time 11:35.

Using Qiskit's simulators - Aer

Output



```
qobj = assemble(qc)
result = sim.run(qobj).result()
counts = result.get_counts()
plot_histogram(counts)
```

**Feedback Link –
Day – II**

<https://forms.gle/2si7BdA767wvkdh2A>

140 Responses

Two days Online Workshop on Quantum Computing and Communication - New Paradigm - Day - II

Feedback form for two days online workshop

asharanispattil@gmail.com [Switch account](#)

* Required

Email *

Your email

Name

Your answer

Organization

Your answer

How satisfied were you with the work shop?

Choose

Would you attend this workshop in future?

☐ yes

☐ No

How satisfied were you with the workshop speakers?

Choose

Any suggestions?

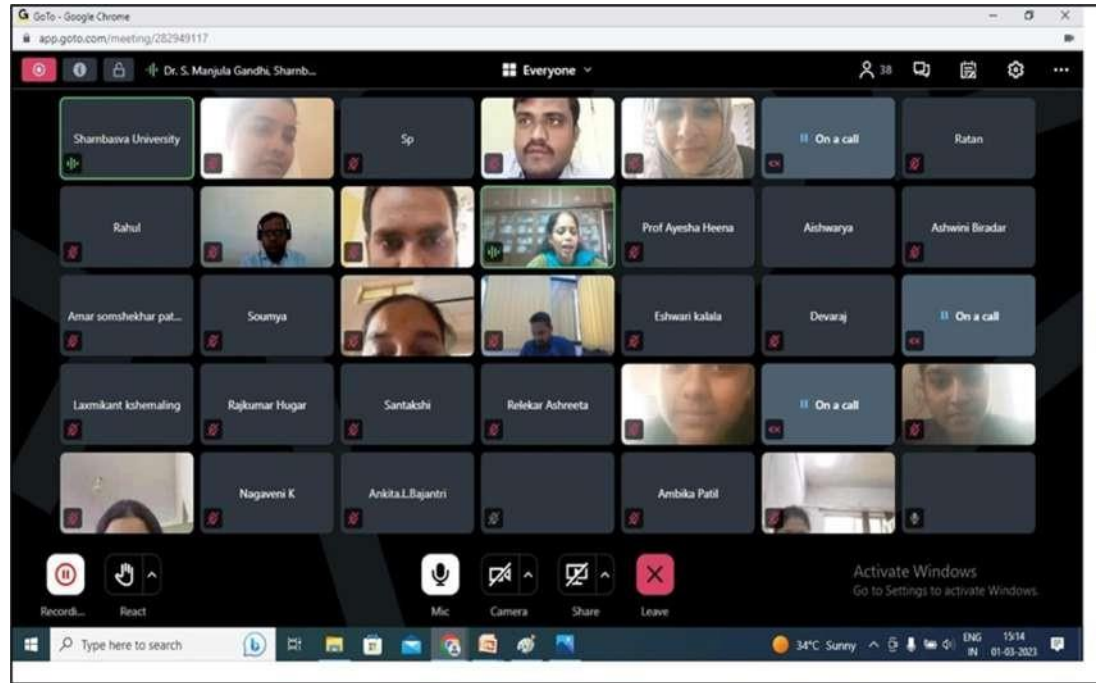
Your answer

[Submit](#) [Clear form](#)

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Photo Session – Day – II



Questions as feedback

1. A qubit is the basic unit of information in quantum computing.
☐ Correct ☐ Wrong
2. Superposition means a qubit can be in more than one state at the same time.
☐ Correct ☐ Wrong
3. Quantum entanglement allows particles to stay connected so that the state of one affects the other instantly.
☐ Correct ☐ Wrong
4. In quantum communication, Quantum Key Distribution (QKD) is used for secure data transfer.
☐ Correct ☐ Wrong
5. The no-cloning theorem means we can make perfect copies of any quantum state.
☐ Correct ☐ Wrong

Appreciation Letter Thanking Letter Attendance Letter	The entire three letters with certificate as resource person along the remuneration were provided to both the resource person.
Feedback Link with E-Certificate	https://forms.gle/LUafzHSXo2Bw1Ljq8 155 Certificates were Downloaded
E-Certificate	

Centenary Celebrated Sharnbasveshwar Vidya Vardhak Sangha's

ಶರಣಬಸವ ವಿಶ್ವವಿದ್ಯಾಲಯ
Sharnbasva University

Kalaburagi-585 103, Karnataka - India | Estd.: 2017

(Under the aegis of centenary Celebrated Sharnbasveshwar Vidya Vardhak Sangha, Kalaburagi - 585103, Karnataka, India)

Two Day Online Workshop on
"Quantum Computing and Communication: New Paradigm"
On the view of
"DigitALL: Innovation & Technology for Gender Equality" -
International Women's Day Week 2023 Celebration
In association with IEEE WIE Affinity Group Bangalore Section, IEEE Bangalore Section,
On 28th February 2023 & 1st March 2023

CERTIFICATE

This is to Certify that Mr./Ms./Mrs./Dr./Prof./ Asharani Patil of Sharnbasva University Kalaburagi attended and participated in Two Day Online Workshop on **"Quantum Computing and Communication: New Paradigm"** On the view of **"DigitALL: Innovation & Technology for Gender Equality"** - International Women's Day Week 2023 Celebration in association with IEEE WIE Affinity Group Bangalore Section, IEEE Bangalore Section Karnataka, India Organized by Department of Electronics & Communication Engg., Faculty of Engineering & Technology - Exclusively for Women, Sharnbasva University, Kalaburagi, Karnataka India. Certificate ID CVERCQ-CE000010

DEAN REGISTRAR VICE-CHANCELLOR CHANCELLOR

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Centenary Celebrated Sharnbasveshwar Vidya Vardhak Sangha's

ಶರಣಬಸವ ವಿಶ್ವವಿದ್ಯಾಲಯ
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On 28th February 2023 & 1st March 2023

CERTIFICATE

This is to certify **Dr. S Manjula Gandhi**, Associate Professor, Department of Computing, Coimbatore Institute of Technology, Coimbatore, Tamil Nadu, India have been as Resource Person-Speaker in Two Day Online Workshop on **"Quantum Computing and Communication: New Paradigm"** On the view of **"DigitALL: Innovation & Technology for Gender Equality"** - International Women's Day Week 2023 Celebration in association with IEEE WIE Affinity Group Bangalore Section, IEEE Bangalore Section Karnataka, India Organized by Department of Electronics & Communication Engg., Faculty of Engineering & Technology - Exclusively for Women, Sharnbasva University, Kalaburagi, Karnataka India.

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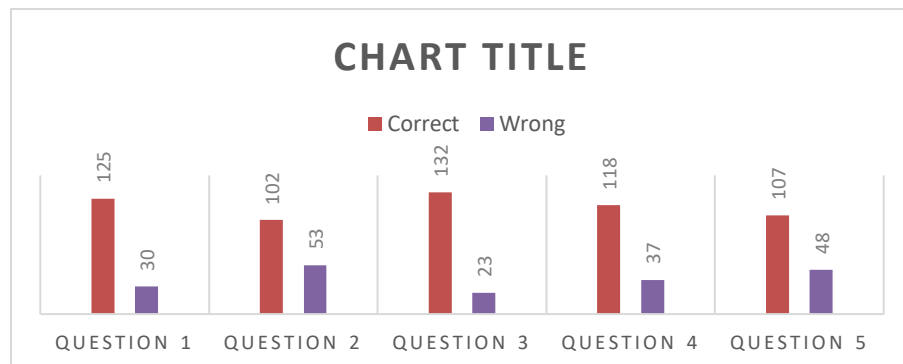
CO's, PO's and PSO's Correlation

CO's	CO Defined	Relevance to PO's and PSO'S
Course Outcome	Understand the fundamental concepts of quantum computing and quantum mechanics. Differentiate classical computing from quantum computing. Explore quantum algorithms and their real-world applications	PO1,PO2 PO6, PO7 PO8, PO10, PO12

Title of the Event: Online Two Days Workshop On “Quantum Computing and Communications: New Paradigm”

Number of Student: 155

Q. No	Correct	Wrong	Total Score	%Attainment = (Total score/ Total no. Students attended)	Average percentage Attainment	Attainment levels	Mapped POs	Mappe d PSOs
1	125	30	125	96.2	96	3	PO1,PO2 PO6, PO7, PO8,PO10 , PO12	PSO1, PSO2, PSO3
2	102	53	102	92.30	92	2		
3	132	23	132	94.23	94	3		
4	118	37	118	92.30	92	2		
5	107	48	107	94.23	94	2		



Impact Analysis Table

Name & Signature of Organizing Coordinator	Name & Signature of Organizing Department Chairman	DEAN & IEEE Branch Counselor