

## Department of Electronics & Telecommunication Engineering

Academic Year – 2020-21	Class: Second Year
Semester – I	Date : 05-10-2020
CO: 3	PO: 1,2,8,10,12

### Innovative Teaching Methods

#### Title of Innovation method/activity: Collaborative Jigsaw

1. **Name of Faculty:** Mr. Viraj R Sonawane.

2. **Subject:** System Programming and Operating System

#### 3. Objective of Method:

1. Acquire the various Concept of Combinational circuit and ability to share acquired knowledge.
2. Analyze, design and implement combinational logic circuits.

#### 4. Topic Covered through Activity:

Combinational Circuits

CODE	Topic	BT Level
T1	Adders and their use as subtractor Design 4-bit Binary subtractor using IC-74LS83.	6
T2	Design 1-digit BCD adder using IC-74LS83.	6
T3	Digital Comparator Design and Implement 8-bit Comparator IC-74LS85	6
T4	Parity generators/checkers, Design Parity generator for 3 bit variable using Multiplexer	6
T5	Multiplexers and their use in combinational logic designs, multiplexer trees Design 8:1 MUX using IC-74LS153	6
T6	De-multiplexers and their use in combinational logic designs, Decoders, Demultiplexer trees Design & Implement 3-bit code converter using IC-74LS138. (Gray to Binary)	6

#### 5. Description of method with Benefits (8 – 10 lines) :

- Jigsaw is a collaborative learning technique that gives students practice in the **acquisition** and **presentation of new material**, in **review**, and in **informed debate**. **Interdependence** and **status equalization** are developed.
- **The method :**
  - Each student on the team becomes an “expert” on one topic
  - “Experts” group with members from other teams assigned the corresponding expert topic.
  - Upon returning to their teams, each one, in turn, teaches the group.

### **Roles and Responsibilities**

- **Teacher**
  - Provide the Introduction to all the topic.
  - Aware the student about the length, Breadth, Depth of Topic
  - Provide the Study Material and appropriate guide lines at every stage
  - Remain available all the time during all stages of process.
  - Prepare assessment methodology.
- **Student**
  - Go through all the material provided on particular topic
  - Once topic assigned understand and gain expertise on topic through collaboration.
  - Actively participate in group and contribute by means of discussion, hand-out
  - Share the expertise topic when joins a new group.
- **Group**
  - Develop the guidelines to establish group.(i.e. Decide the roll of all participants)
  - Every group should gain the expertise on particular topic.
  - Prepare at least one page Hand-out / Report which cover all the details corresponding to the topic.
  - While preparing the report make sure all the content are covered.
  - Appropriate references should be given.
  - Grammatical mistake should be checked.
  - Develop the guidelines with which every group member can share the topic they learn

### **6. Assessment Tools & Rubrics :**

- **Quiz (60 %)**
  - Individual performance would be checked through the quiz.
- **One Page Report / Hand out / Presentation Video (20 %)**
  - Group Report would be checked by teacher according to the rubrics.
- **Polling (20 %)**
  - Every student would rate understanding of all topics which reflect the communication skill of particular group through polling.

- **Overall Individual Performance**

- Final Marks Obtained =  $(0.6 * (\text{Quiz Marks} / 30) + 0.2 * \text{Report\_Marks} + 0.2 * \text{Polling Marks})$

**Rubrics for Assessment of One Page Report / Hand out**

Criteria	Excellent (10-9)	High(8-7)	Moderate(6-5)	Slight (4-1)
<b>Topic Content (60 %)</b>	Highly relevant and concise	Highly Relevant	Moderately Relevant	Slightly Relevant
<b>References (20 %)</b>	Highly Relevant References used along with own comment	Highly Relevant	Moderately Relevant or improperly written	No / Wrong References
<b>Presentation and Writing Skill (20 %)</b>	Neat , Clean Diagrams & Grammatically Correct	Diagrams & Grammatically Correct	Diagrams included	Poorly Written

Marks for One page Report:

<b>OUT OF 10 MARK</b>					
SN	Group No	Topic Content (60 %)	References (20 %)	Presentation and Writing Skill (20 %)	Final Marks (100 %)
1.	T1	10	5	10	9
2.	T2	10	5	8	8.6
3.	T3	9	5	8	8
4.	T4	10	7	9	9.2
5.	T5	8	5	6	7
6.	T6	6	6	7	6.2

## Polling Marks

OUT OF 10 MARK				
SN	Group No	How Much do you find explanation or notes or presentation material OR Video of particular topic helpful (CO3)	How Much do would rate understanding of topic (CO3)	Final Marks (100 %)
1.	T1	4.15	4.00	8.15
2.	T2	4.17	4.23	8.40
3.	T3	4.09	3.96	8.04
4.	T4	4.21	4.30	8.51
5.	T5	4.09	4.06	8.15
6.	T6	4.23	4.17	8.40

## 7. Evaluation Sheet

$$\text{Final Marks} = 0.2 * \text{Polling} + 0.2 * \text{Report} + 0.6 * (\text{Quiz} / 30)$$

OUT OF 10 MARK						
Sn	Name	Topic Code	Group Polling Marks (20 %)	Report (20 %)	Quiz (60 %)	Final Marks (100 %)
1	Apurva Jitendra Sali	1	8.15	9	10	9.43
2	Jagruti Pratap Borse	1	8.15	9	10	9.43
3	Jaydip Gorakshanath Pathak	1	8.15	9	10	9.43
4	Nikita Ravindragir Gosavi	1	8.15	9	10	9.43
5	Dhirajkumar Saindani	1	8.15	9	10	9.43
6	Nikita Raosaheb Navale	1	8.15	9	10	9.43
7	Priyanka Janardhan Borse	1	8.15	9	9	8.83
8	Ishwar Changdev Devkar	1	8.15	9	8	8.23
9	Ayush Prashant Jadhav	1	8.15	9		3.43
10	Vishe Janhavi Sunil	1	8.15	9		3.43
11	Dipak Namdev Jadhav	2	8.4	8.6	10	9.4
12	Pooja Sandeep Kalgude	2	8.4	8.6	10	9.4
13	Siddhi Hemant Bafana	2	8.4	8.6	10	9.4
14	Vaishali Dnyaneshwar Mogal	2	8.4	8.6	10	9.4
15	Payal Chaudhari	2	8.4	8.6	10	9.4
16	Sanika Yogesh Suryawanshi	2	8.4	8.6	10	9.4
17	Prachi Govind Jorwar	2	8.4	8.6	9	8.8
18	Avhad Komal Govind	3	8.04	8	10	9.208

19	Dhvani Sanjay Patel	3	8.04	8	10	9.208
20	Durva Jivanchandra Kansepatil	3	8.04	8	10	9.208
21	Hemant Gotiram Jadhav	3	8.04	8	10	9.208
22	Rituja Sunil Bedse	3	8.04	8	10	9.208
23	Manisha Anil Tipare	3	8.04	8	10	9.208
24	Jayesh Pramod Gharate	3	8.04	8	9	8.608
25	Yash Rakesh Bhavsar	3	8.04	8	6	6.808
26	Aditya Sanjay Gangurde	4	8.51	9.2	10	9.542
27	Dipali Babasaheb Gore	4	8.51	9.2	10	9.542
28	Kaveri Govindrao Kardile	4	8.51	9.2	10	9.542
29	Tanvi Mahendra Patil	4	8.51	9.2	10	9.542
30	Nikhil Bhagwat Patil	4	8.51	9.2	10	9.542
31	Gayatri Sanjay Jadhav	4	8.51	9.2	9	8.942
32	Yash Vijay Gabale	4	8.51	9.2		3.542
33	Hemant Vilas Pelmahale	5	8.15	7	10	9.03
34	Parth Jitendra Patil	5	8.15	7	10	9.03
35	Dhake Niket Ravindra	5	8.15	7	8	7.83
36	Kamlesh Raju Gorade	5	8.15	7	7	7.23
37	vaishnavi bhavsar	5	8.15	7	6	6.63
38	Nimish Rajesh Bhangale	5	8.15	7	3	4.83
39	Aditya Shamrao Patil	5	8.15	7		3.03
40	Jadhav Shubham Pravin	5	8.15	7		3.03
41	Sonawane Anushka Ramesh	5	8.15	7		3.03
42	Yash Yatin Yeola	5	8.15	7		3.03
43	priyanka chaudhari	5	8.15	7		3.03
44	Janhvi Bharatkumar Desale	6	8.4	6.2	10	8.92
45	Madhura Nitin Birari	6	8.4	6.2	10	8.92
46	Sakshi Dipak Shewale	6	8.4	6.2	10	8.92
47	Aarti Sharad Shirsat	6	8.4	6.2	9	8.32
48	Gautami Anil Patil	6	8.4	6.2	9	8.32
49	Gayatri Bhavrao Bhamare	6	8.4	6.2	9	8.32
50	Dhanashri Sharad Sonawane	6	8.4	6.2		2.92
51	Rutuja Dattu Pingle	6	8.4	6.2		2.92
52	Sagar Rajendra Aher	6	8.4	6.2		2.92
53	Sonawane Vaishnavi	6	8.4	6.2		2.92
54	Atharva Sanjay Kothawade				10	6
55	Bodke Dipendra Uttam				10	6
56	Shivani Kundan Phadtare				10	6
57	Srushti Somnath Adhav				10	6
58	Sunny Ambadas Andhalkar				10	6
59	ansushka sonawane				10	6
60	Chaitrali Mukund Gaikwad					
61	Chetan Dilip Patil					

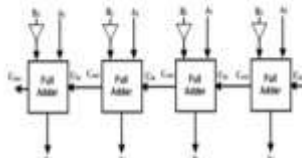

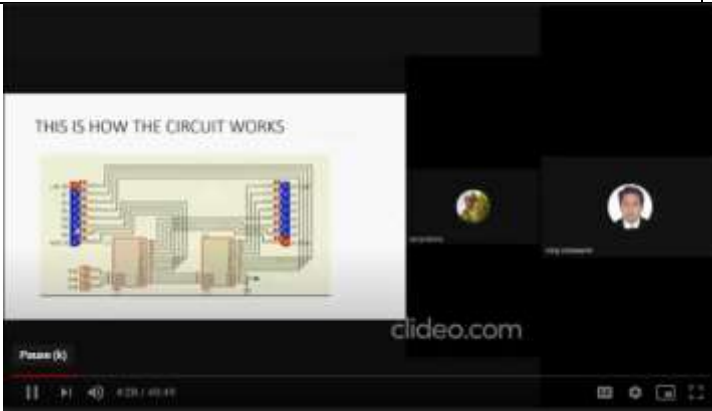
<b>62</b>	Mandar Narendra Tayade					
<b>63</b>	Sagar Jaysing Bharwad					
<b>64</b>	Sakshi Shailendra Udawant					

<b>SN</b>	<b>Result Analysis</b>	
<b>1</b>	<b>Total Student Present Student</b>	<b>59</b>
<b>2</b>	<b>Number of Student Scoring above 60%</b>	<b>46</b>
<b>3</b>	<b>Percentage of student Scoring above 60%</b>	<b>78%</b>

### 8. Impact Analysis

<b>SN</b>	<b>4- Excellent</b>	<b>3- High</b>	<b>2- Moderate</b>	<b>1- Slight</b>
<b>Do you find Methodology Helpful</b>	27	14	6	0
<b>Does this helps for building a good team</b>	36	7	4	0
<b>Does the content covered are relevant</b>	27	15	5	0
<b>Are you able to understand the concept and design of combinational circuits (CO3)</b>	26	16	5	0
<b>Would You Like To Participate in This Methodology again</b>	47-YES	0 - NO		

## 9. Activity Picture

<p><b>n-bit parallel Subtractor(Use of Adder as a Subtractor)</b></p> <p><b>Block Diagram</b></p>  <ul style="list-style-type: none"><li>• The number to get subtracted (B) is first passed through inverters to obtain its <b>1's Complement</b>. One inverter per bit of B is used so that all the bits of B get inverted.</li><li>• Then, <b>this 1's complement is added with the 1</b> i.e. <math>C_{in} = 1</math> (Carry in = 1). Hence, in this manner we get <b>2's complement of B</b>.</li><li>• This 4-bit parallel adder then adds A with 2's complement in order to produce subtraction at its sum outputs <math>S_3, S_2, S_1, S_0</math>.</li></ul>	
	<p>Activity Video Link :</p> <p><a href="https://classroom.google.com/c/MTI4NzMxMTkzNzNm4/m/MTgzODE4MzQ1ODMw/details">https://classroom.google.com/c/MTI4NzMxMTkzNzNm4/m/MTgzODE4MzQ1ODMw/details</a></p>

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