

# GOUR MAHAVIDYALAYA, MANGALBARI, MALDA

**DEPARTMENT: MATHEMATICS**

**01.07.2019 to 30.06.2020**



**TEACHING AND LEARNING: USE OF ICT TOOLS**

**OFFLINE AND ONLINE CLASS : DOCUMENTS**

## ONLINE TEACHING AND LEARNING P:2019-20

### DOCUMENTS

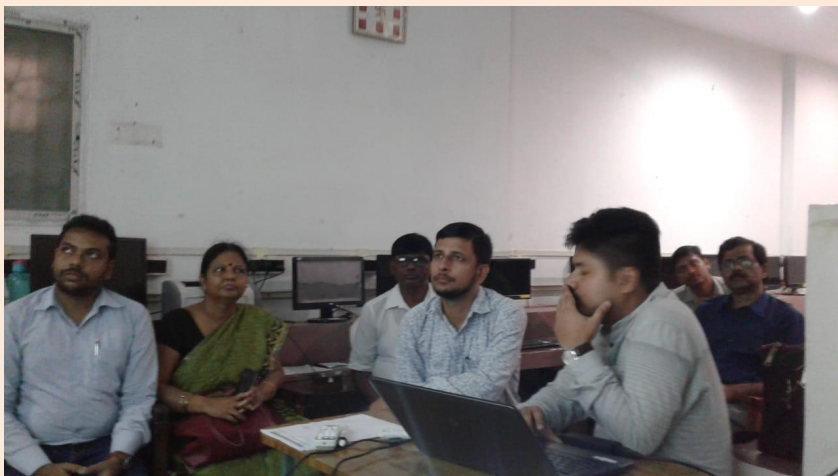
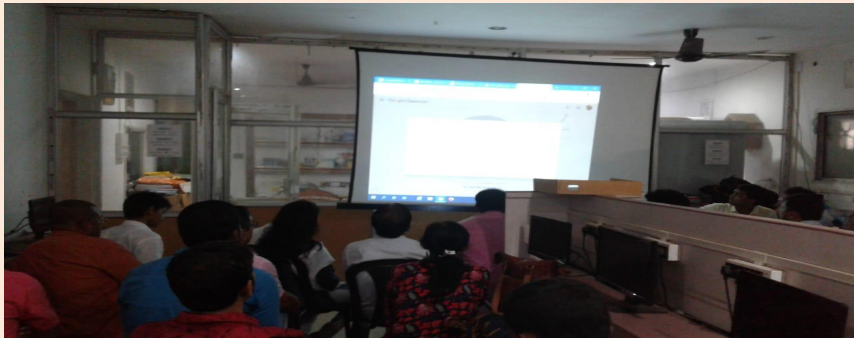
Name of Teacher and Department	Name of the Module	Platform on which module is developed	Date of launching offline and online classes
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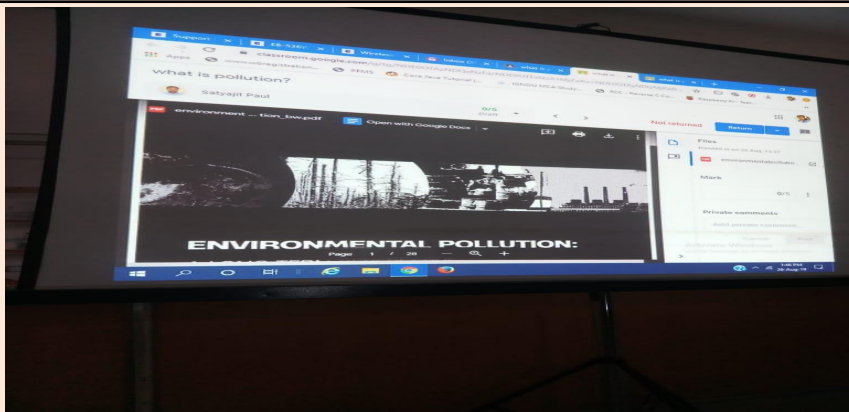
<b>1.MATHEMATICS: Rakesh Sarkar,Assistant Professor in Mathematics</b>	<b>Orientation,Class( Offline), Zoom Meeting, Google Meeting,Google Classroom,gmail.com,Whats App Group :uploading and sharing of relevant course/study materials and on line class( Offline:</b>	<b>Screen, Laptop, Projector ( Offline) Laptop, Mobile Online)</b>	<b>11.7.2019( Offline),2.4.2020 onwards( Online)</b>
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	<b>Laptop,Screen, Projector)</b>		
<b>2. Tilak Kumar Pal, State Aided College Teacher, Mathematics</b>	<b>Zoom Meeting, Google Meeting,Google Classroom,gmail.com,WhatsApp App Group :uploading and sharing of relevant course/study materials and on line class( Offline: Laptop,Screen, Projector)</b>	<b>Screen, Laptop, Projector ( Offline) Laptop, Mobile Online)</b>	<b>11.7.2019 ( Offline),2.4.2020 onwards( Online)</b>
<b>3.Poly Karmakar, State Aided College Teacher, Mathematics</b>	<b>Zoom Meeting, Google Meeting,Google Classroom,gmail.com,WhatsApp App Group :uploading and sharing of relevant course/study materials and on line class( Offline: Laptop,Screen, Projector)</b>	<b>Screen, Laptop, Projector ( Offline) Laptop, Mobile Online)</b>	<b>17.3.2020 onwards</b>
<b>4.Md Sahid Alam, State Aided College Teacher,</b>	<b>Zoom Meeting, Google Meeting,Google Classroom,gmail.com,WhatsApp App Group :uploading and sharing of</b>	<b>Screen, Laptop, Projector ( Offline) Laptop, Mobile Online)</b>	<b>8.4.2020 onwards</b>

<b>Mathematics</b>	<b>relevant course/study materials and on line class( Offline: Laptop,Screen, Projector)</b>		
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**Photo-Screen Shot -Online Class,Offline class- Use of ICT Tools:**





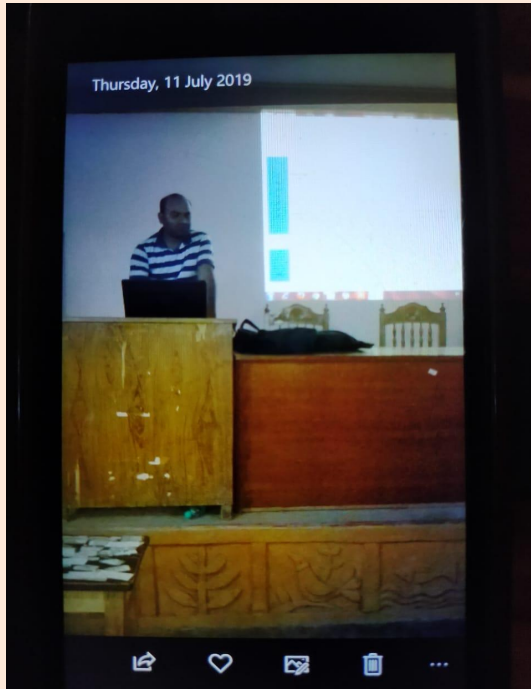
**Programme: Demonstration of Google Class Room :(a) Links of website/app for free tutorials and e- contents;(b)Creation of whatsApp group of students; (c)Use of Google classroom as learning management system;(d)Swayam poster**

**update:Demonstrators:**

**Syfujjaman Tarafder, Convenor of e- learning committee, Sri Arijit Bhattacharya, Assistant Professor in Computer Science, member of ICT committee, Mr Ekram Alam, Assistant Professor in Computer Science, member of ICT committee, Sri Akhil Das, Convenor, ICT Committee, Mursed Alam, Assistant Professor in English, Sri Satyajit Paul, Assistant Coordinator, IQAC: Venue: Department of Computer Science: Date: 26.8.2019 ( From 1 P.M. to 3 P.M.)**

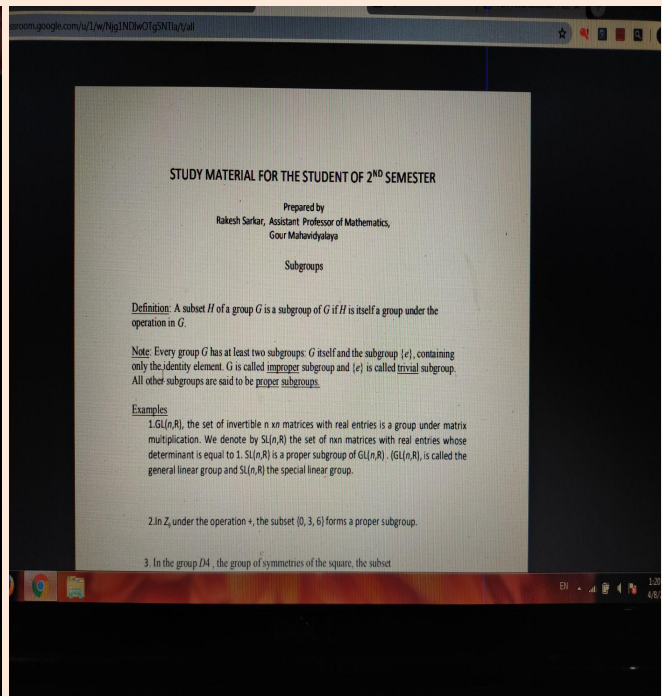
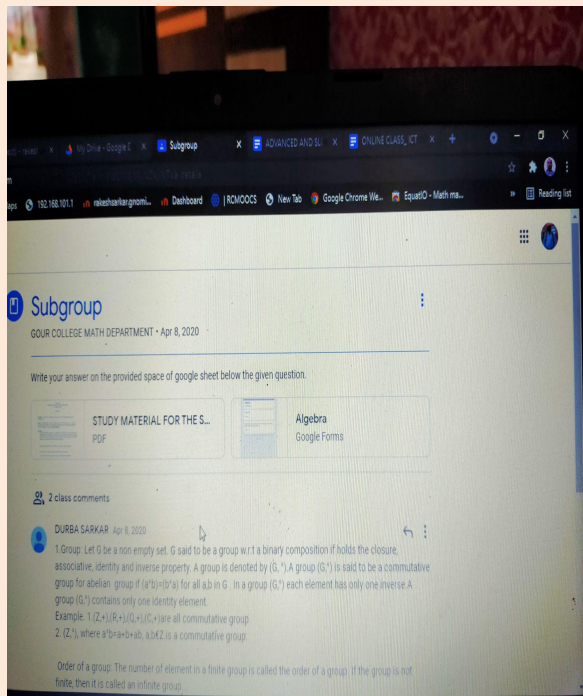


**( CBCS:Central Orientation of Programme:Dr.AnirbanRay,Member Academic Council,11.7.2019)**

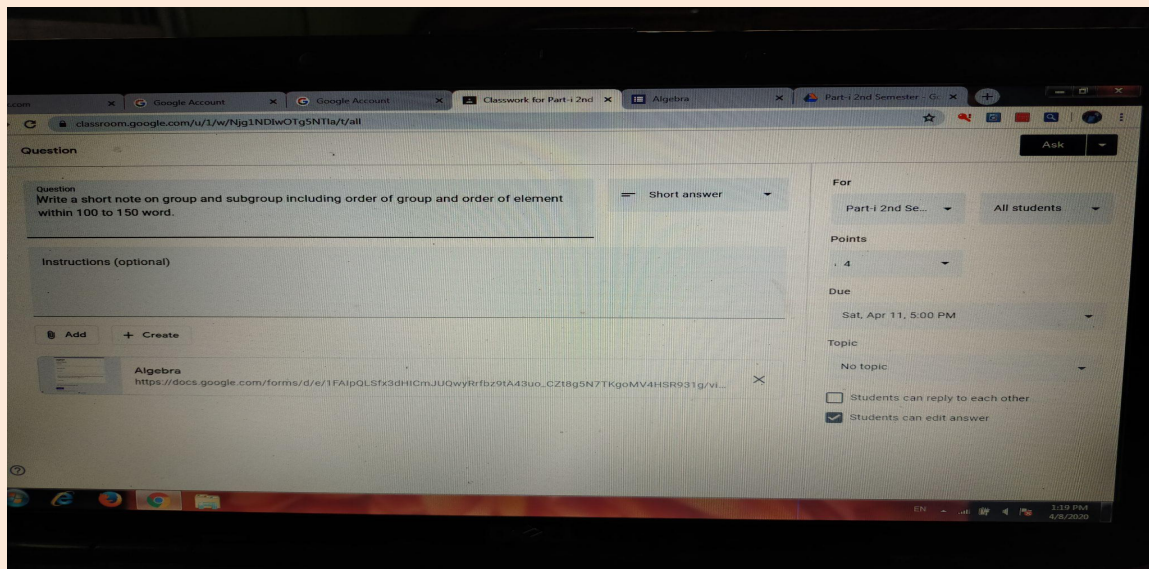


**Student Orientation Programme  
DEPARTMENT:- : MATHEMATICS  
, Rakesh Sarkar, Assistant Professor)  
Date:11.7.2019**

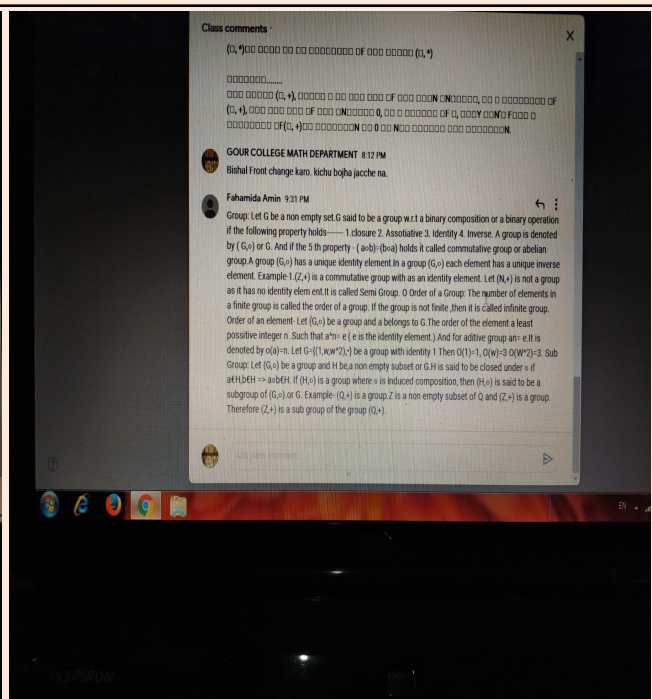
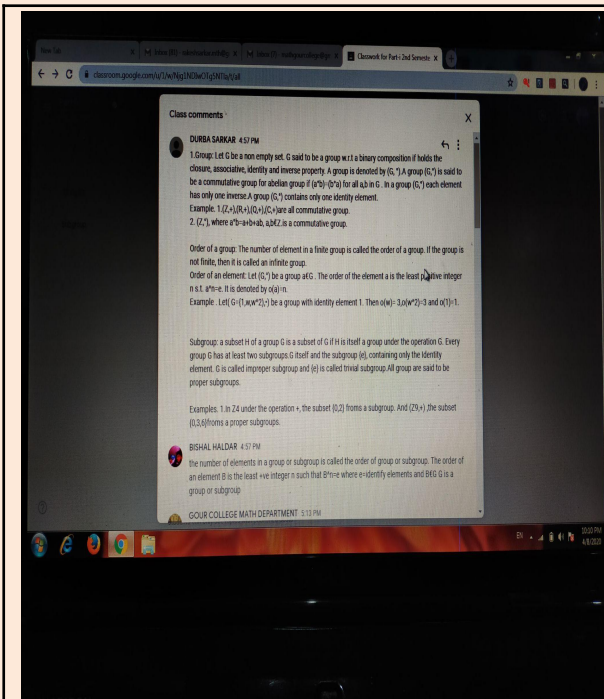
# ONLINE CLASS:



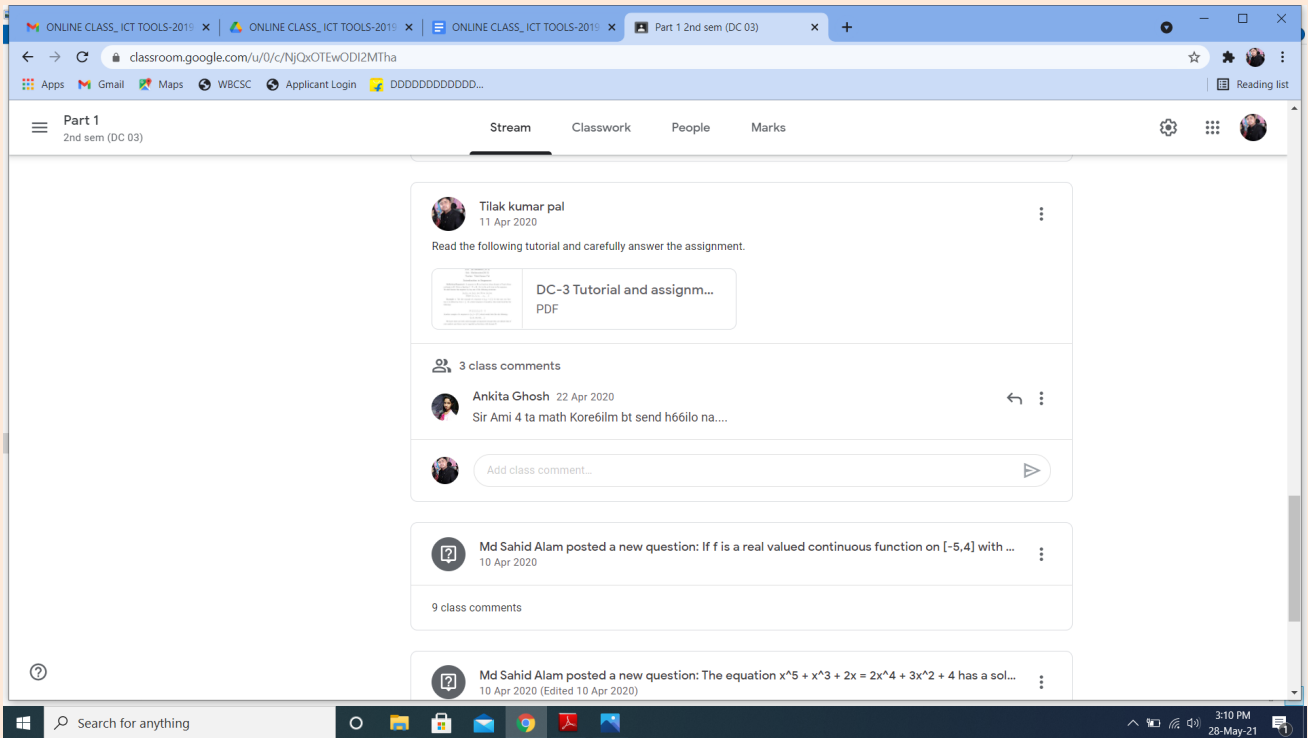
**Rakesh Sarkar submitted study material through Google Classroom on 08.04.2020**



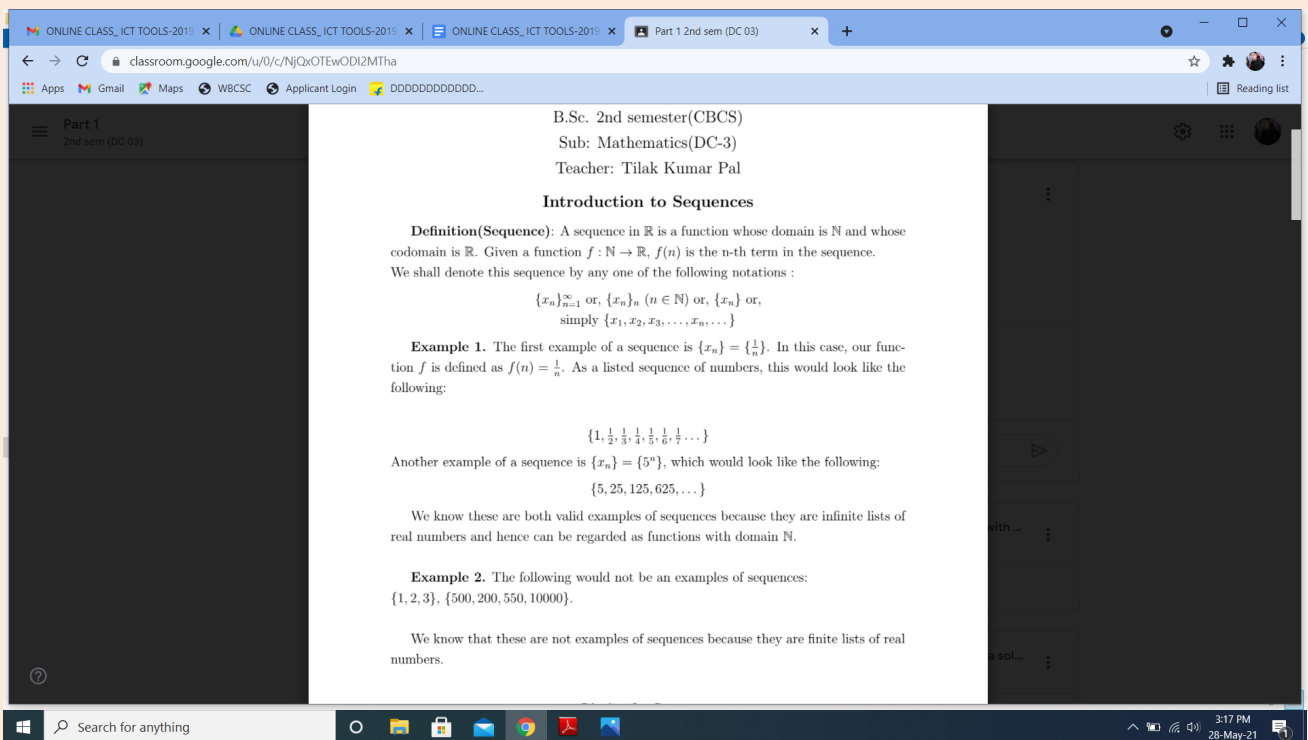
**Rakesh Sarkar posted Assignment question trough Google Classroom on 08.04.2020**



**Students submitted Assignment through Google Classroom**



**Tilak Kumar Pal submitted study material through Google classroom on 11-03-2020.**





Tilak Kumar Pal, Submitted tutorial through Google classroom on 15-03-2020.

**Assignment**

**Answer all the questions:**

1. Define the limit of a sequence. use your definition to show that
$$\lim_{n \rightarrow \infty} \frac{n^2+n+1}{3n^2+1} = \frac{1}{3}$$
2. Use sandwich theorem to prove that
$$\lim_{n \rightarrow \infty} \left( \frac{1}{\sqrt{n+1}} + \frac{1}{\sqrt{n+2}} + \dots + \frac{1}{\sqrt{n+n}} \right) = 1$$
3. Evaluate the limit
$$\lim_{n \rightarrow \infty} \sqrt[n]{n}$$
4. Use Limit theorem to show that
$$\lim_{n \rightarrow \infty} (\sqrt[n]{n+1} - \sqrt[n]{n}) = 0$$
5. Define convergence of a sequence in  $\mathbb{R}$ . To discuss the convergence of the sequence  $\{x_n\}$  where  $x_n = \frac{n-1}{2n}$ .

**Tilak Kumar Pal submitted Assignment through Google Classroom on 20-03-2020.**

**B.Sc. 2nd semester (CBCS)**  
**Sub: Mathematics (DC-3)**  
**Topic: Sequence in  $\mathbb{R}$**   
**Teacher: Tilak Kumar Pal**

**Theorem :** Every Convergent sequence is bounded.

**Proof:** Let  $\{x_n\}$  be a convergent sequence with limit  $l$ .  
Then, given any  $\epsilon > 0$  (take  $\epsilon = 1$ ),  $\exists$  a positive integer  $n_0$  such that
$$\forall n > n_0, |x_n - l| < 1.$$

Its follows that
$$|x_n| = |x_n - l + l| \leq |x_n - l| + |l| < 1 + |l|, \quad \forall n > n_0.$$

Let
$$k = \max\{|x_1|, |x_2|, \dots, |x_{n_0}|, |l| + 1\}.$$

Then clearly,
$$|x_n| \leq k, \quad \forall n.$$

i.e.,  $\{x_n\}$  is a bounded sequence.

**Observation :** Converse of this theorem is not true  
Every bounded sequence is not Convergent.  
For e.g.  $\{x_n\}$  where

## Tilak Kumar Pal submitted study material through Google Classroom on 11-04-2020.

The screenshot shows a Google Classroom interface for a class titled 'Part 1' (2nd sem (DC 03)). The assignment is 'sequence in R' with a value of 15 points. The student 'DURBA SARKAR' is marked and has submitted four handwritten images of their work. The submission times are: Apr 23, 2020 3:45:49 PM, Apr 23, 2020 3:47:13 PM, Apr 23, 2020 3:48:30 PM, and Apr 23, 2020 3:49:25 PM. A private comment from Durba Sarkar dated 23 Apr 2020 says 'Submit hoye6e sir'. The left sidebar shows a list of students: Fahamida Amin (15), Ankita Ghosh (4 Draft), sohel Ahamed (Missing), Sahin Ali (Missing), and MD ARIF (Missing).

## Tilak Kumar Pal, Students response sheets for Assignment through Google Classroom on 23-04-2020.

The screenshot shows a mathematics exam paper titled 'Gour Mahavidyalaya B.Sc. 3rd Year Examination 2020 Sub: Mathematics Six Paper Internal Assessment'. The instructions state: 'Answer any four questions: Marks: 4 x 5 = 20'. The questions are:

- The random variable  $X$  and  $Y$  have the joint density function
 
$$f(x, y) = \begin{cases} 6(1-x-y), & x > 0, y > 0, x+y < 1 \\ 0, & \text{elsewhere} \end{cases}$$
 Find the marginal distribution of  $X$  and  $Y$ . Are  $X$  and  $Y$  independent?
- If  $m$  and  $\mu_r$  denote the mean and central  $r$ -th moment of a poisson distribution, then prove that
 
$$\mu_{r+1} = r m \mu_{r-1} + m \frac{d\mu_r}{dm}$$
 and hence find  $\gamma_1$  and  $\gamma_2$ .
- Prove Schwartz's inequality for expectations that
 
$$[E(XY)]^2 \leq E(X^2)E(Y^2)$$
 and hence deduce that
 
$$-1 \leq \rho(X, Y) \leq 1$$
- Define divided difference of two arguments  $x_0, x_1$  and prove that

## Tilak Kumar Pal Post Internal examination Question Paper Through Google Classroom on 15-6-2020.

3rd Year Hons.-2019-20

Internal Assessment , Paper -VI

39 Handed in 8 Assigned

All

MD NOOR ALAM "Name : MD NOOR ALAM Reg... _ / 20	Sajahan Ali "Thank you for submitting yo... _ / 20	Umme Ayman "Thank you for submitting yo... _ / 20	Eshme Azam "Thank you for submitting yo... _ / 20	Krishna Basak "Thank you for submitting yo... _ / 20
Subhojit Biswas "SUBHOJIT BISWAS REG - 12... _ / 20	Internal assessment 2... Handed In	Document from Sajahan... Handed In	6th paper(modified).pdf Handed In	paper vi.pdf Handed In
	Document 2.pdf Handed In			

## Tilak Kumar Pal, Students Response Sheet of Internal Examination through Google Classroom on 20-06-2020.

2nd Year Hons -2020

Gour Mahavidyalaya  
B.Sc. 2nd Year  
Sub: Mathematics  
III & IV Paper  
Internal Assessment

Answer any four questions: Marks:  $4 \times 5 = 20$

- If in the differential equation,  $Mdx + Ndy = 0$ ,  

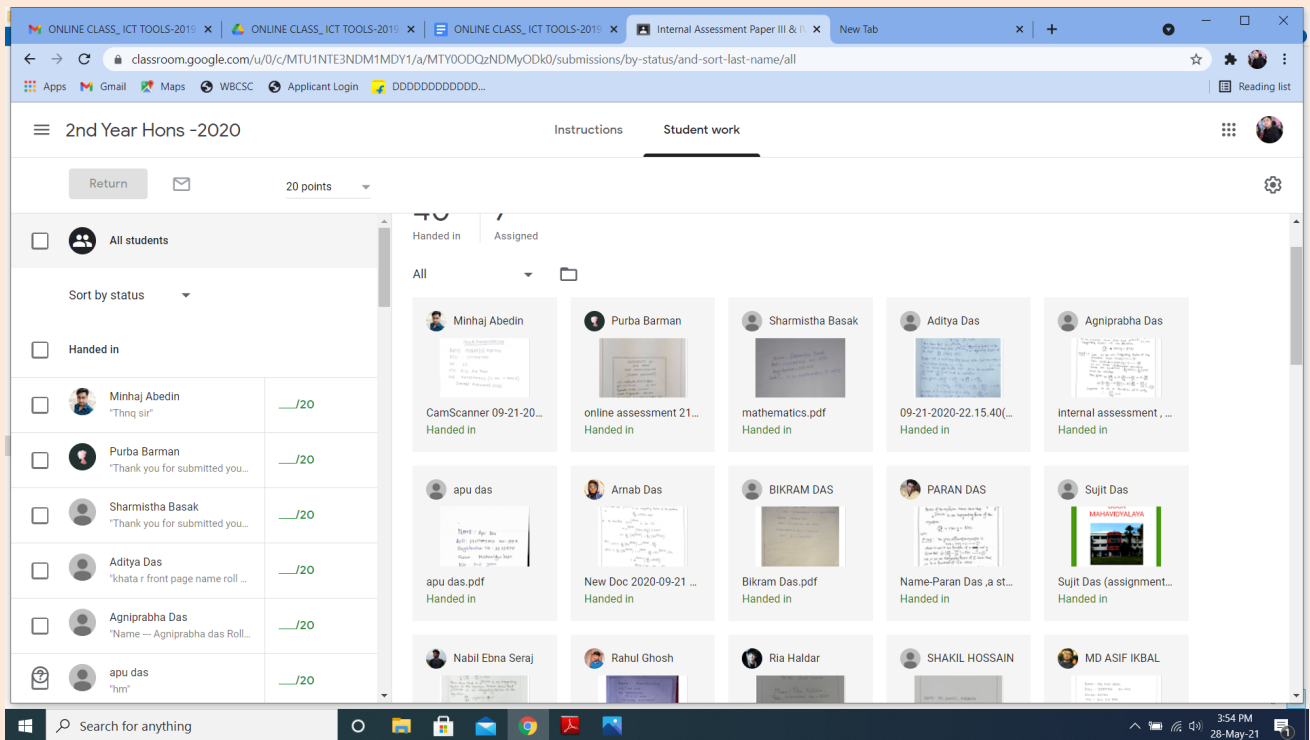
$$\frac{1}{N} \left( \frac{\partial M}{\partial y} - \frac{\partial N}{\partial x} \right) = f(x)$$
then show that  $\mu = e^{\int f(x)dx}$  is an integrating factor of the equation. Hence show that  $e^{\int P(x)dx}$  is an integrating factor of the equation  

$$\frac{dy}{dx} + P(x)y = Q(x).$$
- If  $\alpha$  be the angle between a pair of tangents of the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , then show that the locus of their point of intersection is  

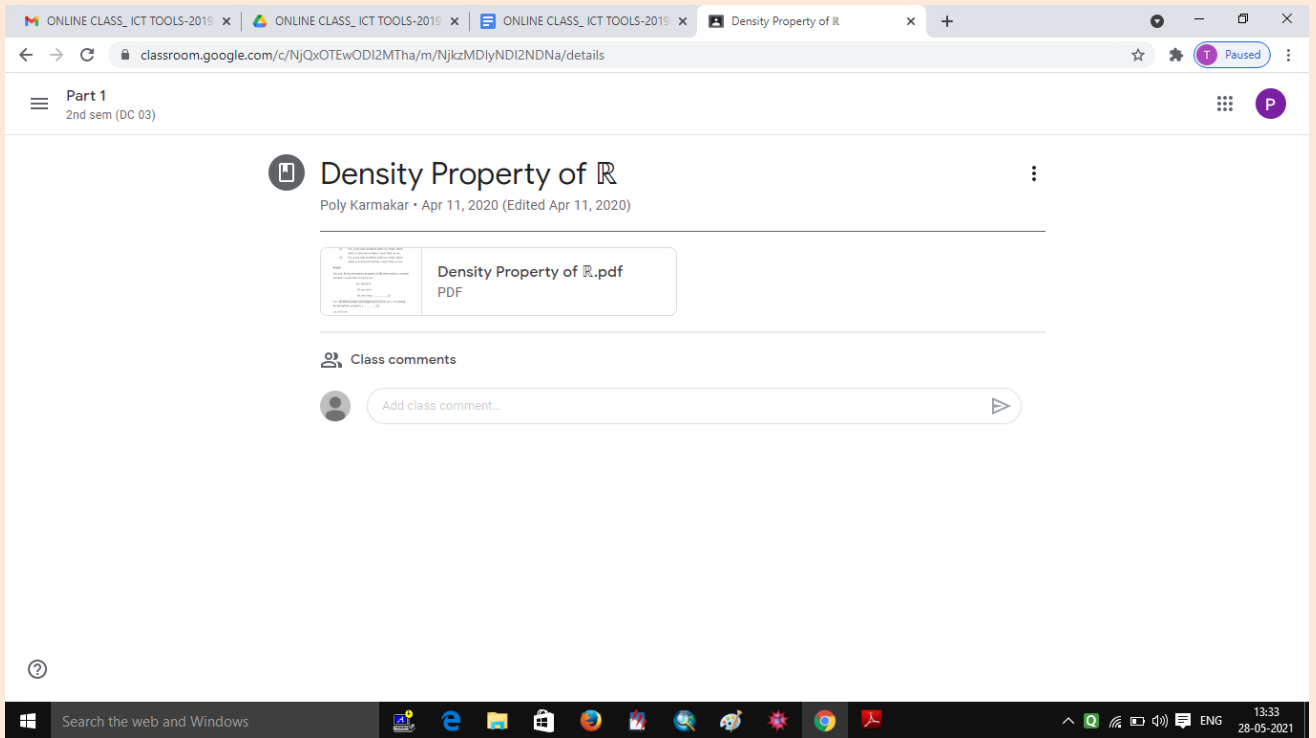
$$(x^2 + y^2 - a^2 - b^2)^2 \tan^2 \alpha = 4(b^2x^2 + a^2y^2 - a^2b^2).$$
- Reduce the equation  $6y^2 - 18yz - 6xz + 2xy - 9x + 5y - 5z + 2 = 0$  to the canonical form and state the nature of the surface represented by it.
- A particle of unit mass moves with a central acceleration  $F$  in a medium of which the resistance is  $k(\text{velocity})^2$ . Show that the equation to the path is  

$$\frac{d^2u}{h^2u^2} + u = \frac{F}{h^2u^2} e^{2ku}$$

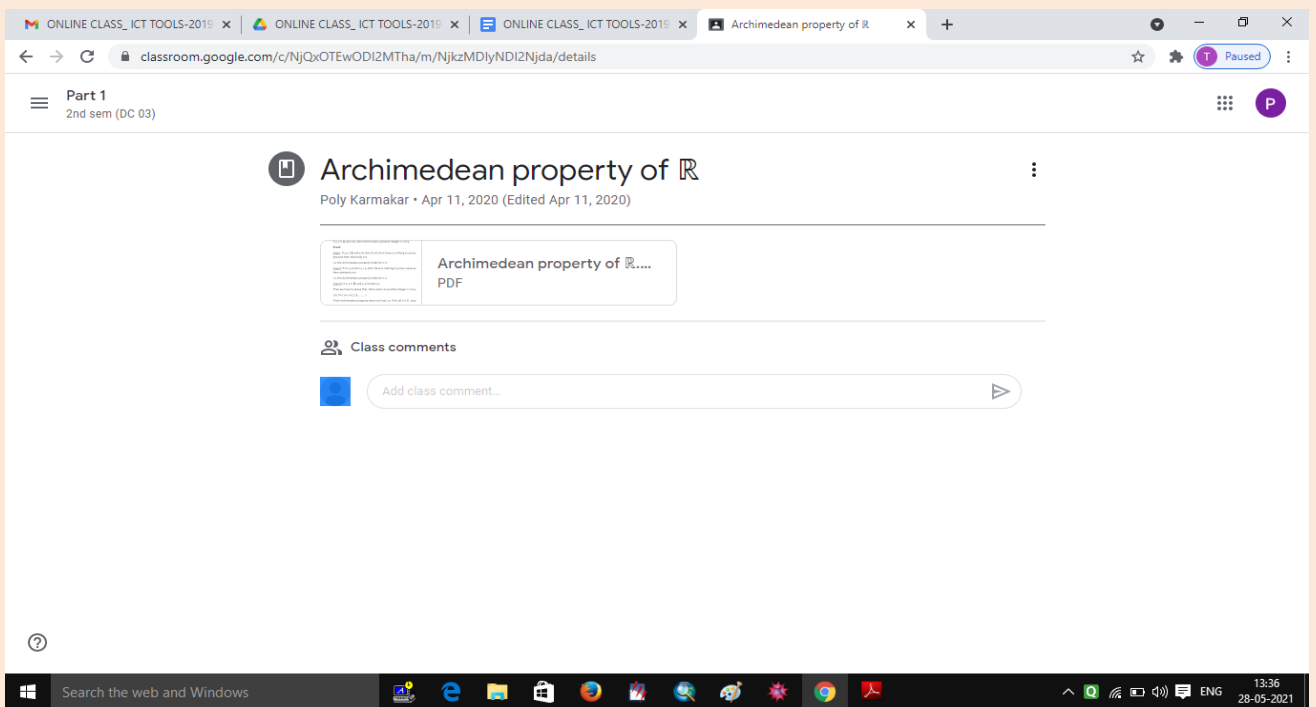
# Tilak Kumar Pal post B.sc 2nd year internal Examination question paper through Google classroom on 10-6-2020.



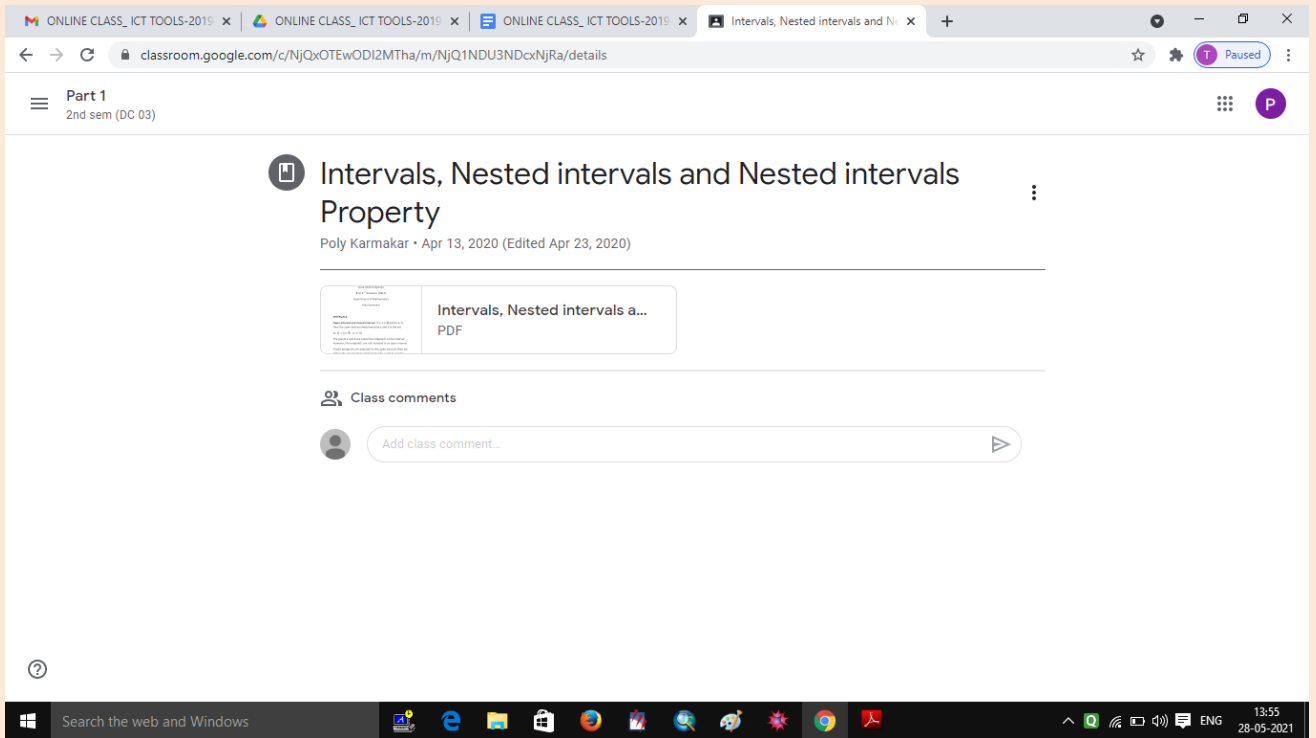
# Tilak Kumar Pal, received B.sc 2nd year internal examination answer paper through Google Classroom.



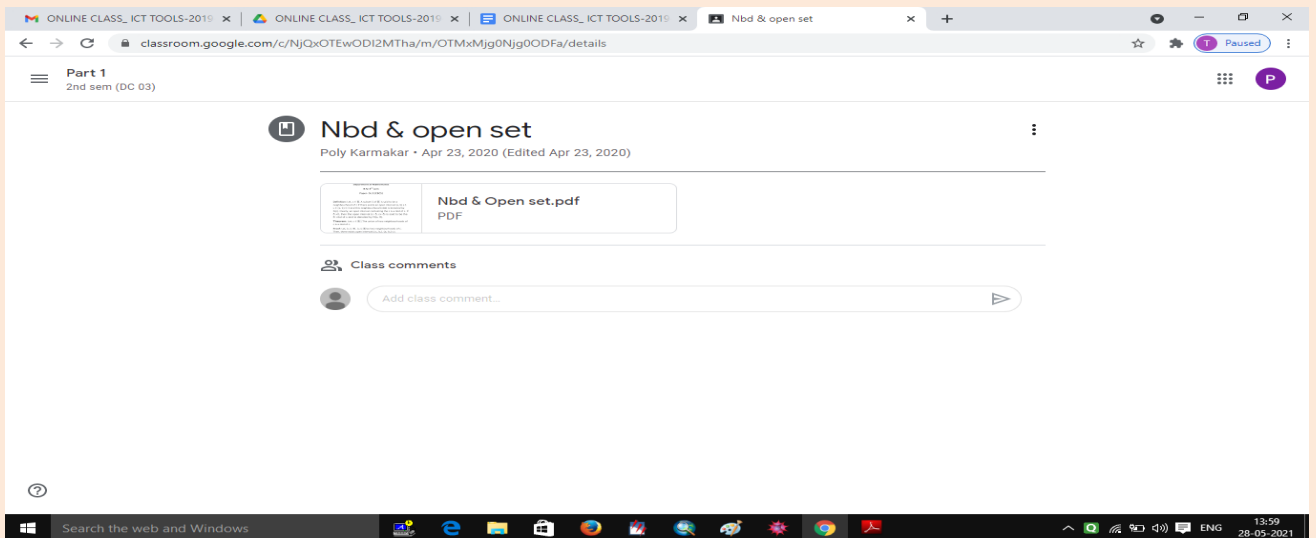
***Poly Karmakar submitted study material through Google Classroom on 11.04.2020.***



***Poly Karmakar submitted study material through Google Classroom on 11.04.2020.***

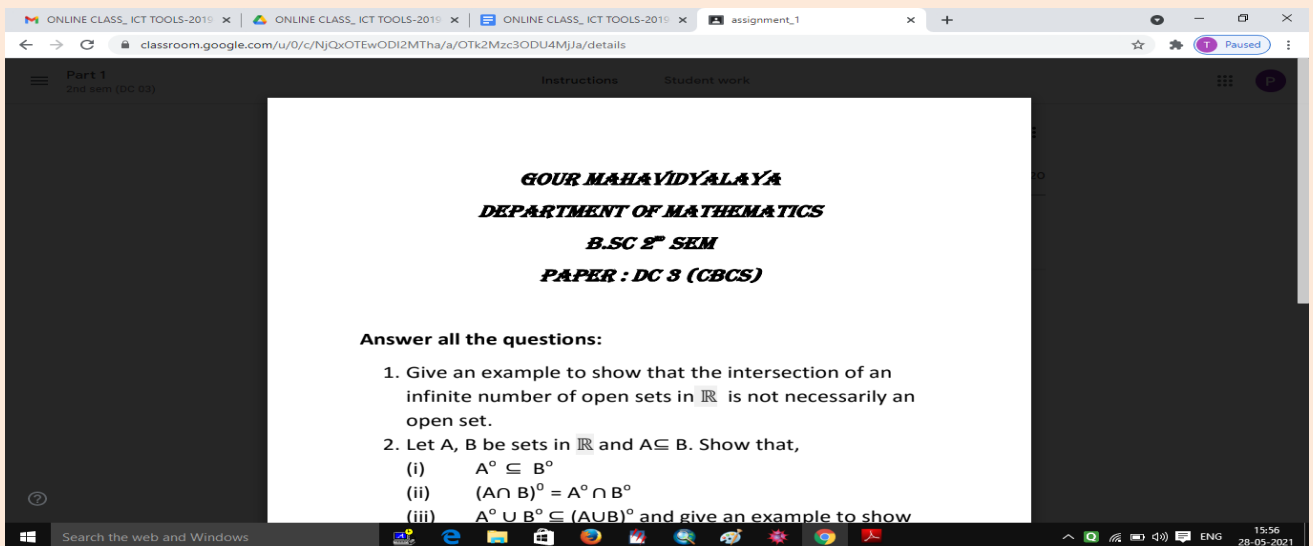
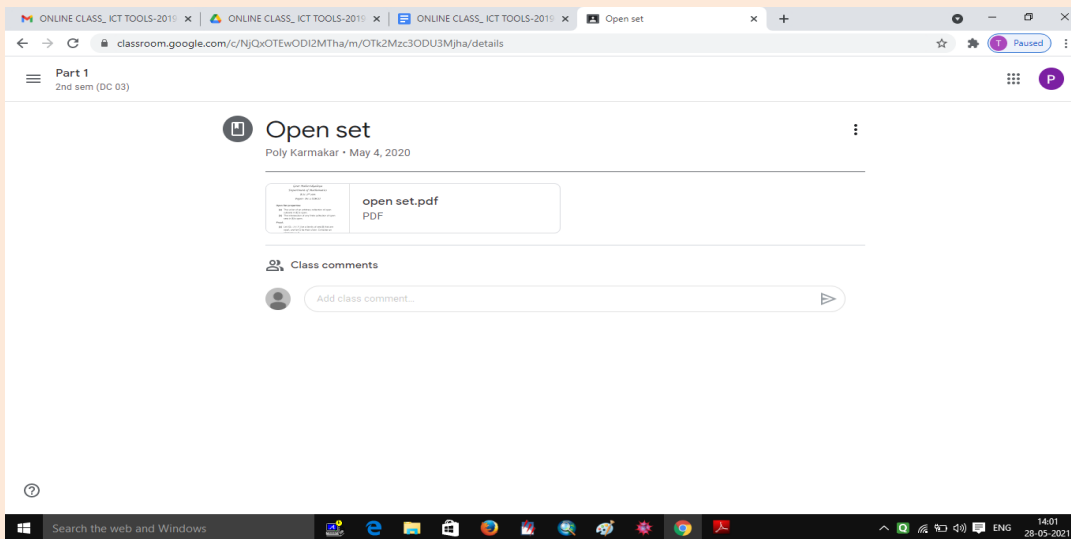


***Poly Karmakar submitted study material through Google Classroom on 13.04.2020.***

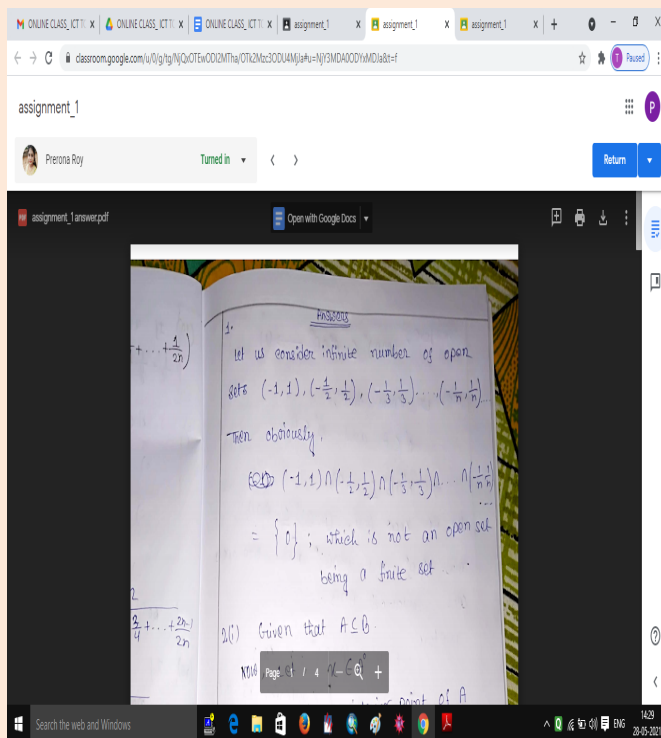
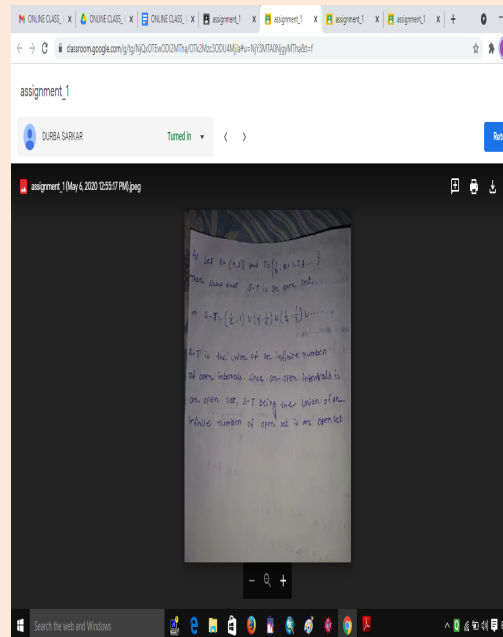
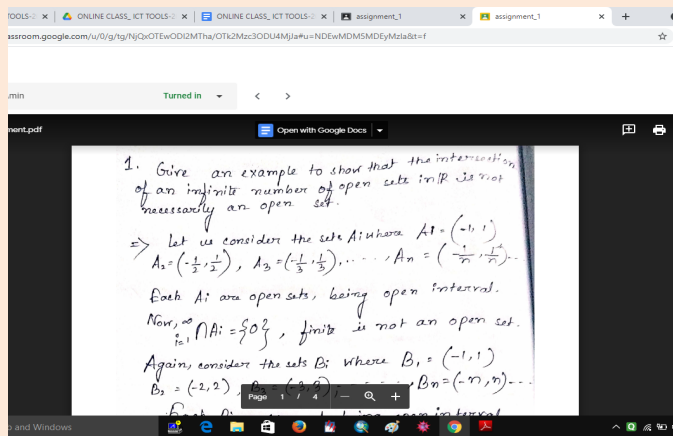


***Poly Karmakar submitted study material through Google***

## Classroom on 23.04.2020.

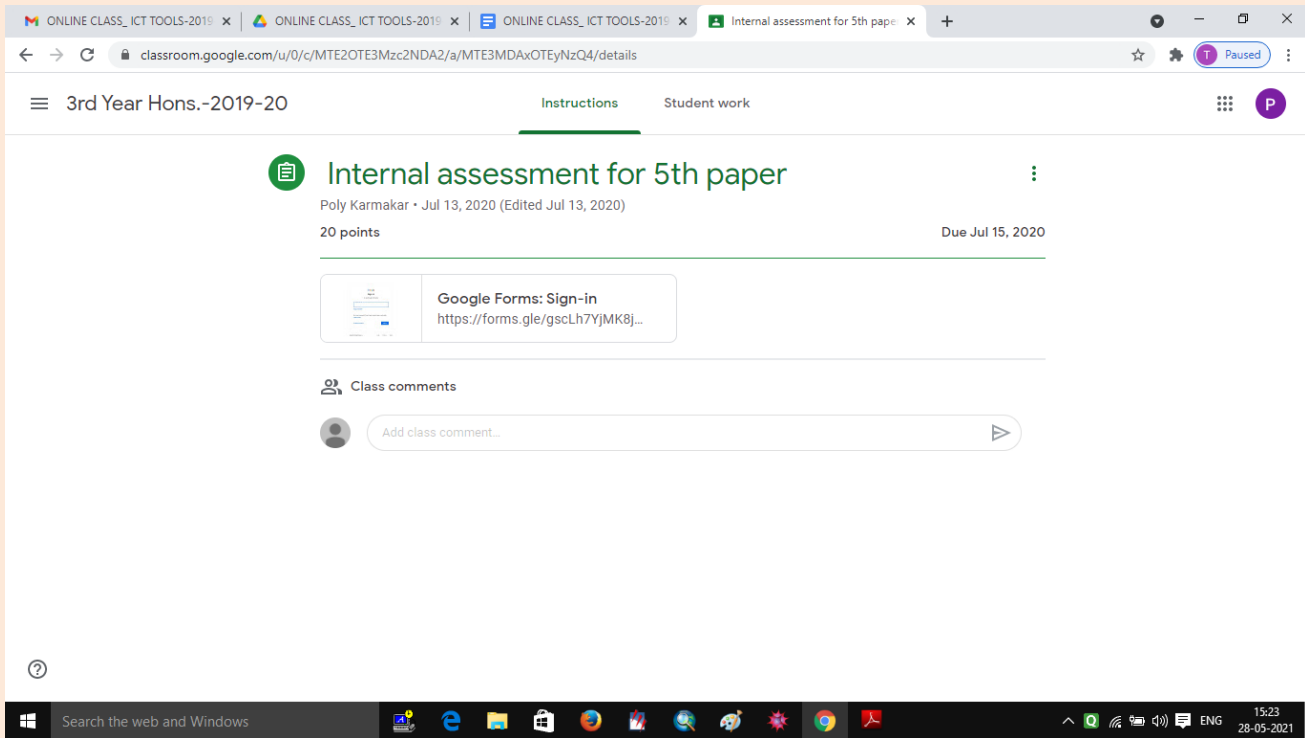


## Poly Karmakar posted an Assignment question through Google Classroom on 08.04.2020.

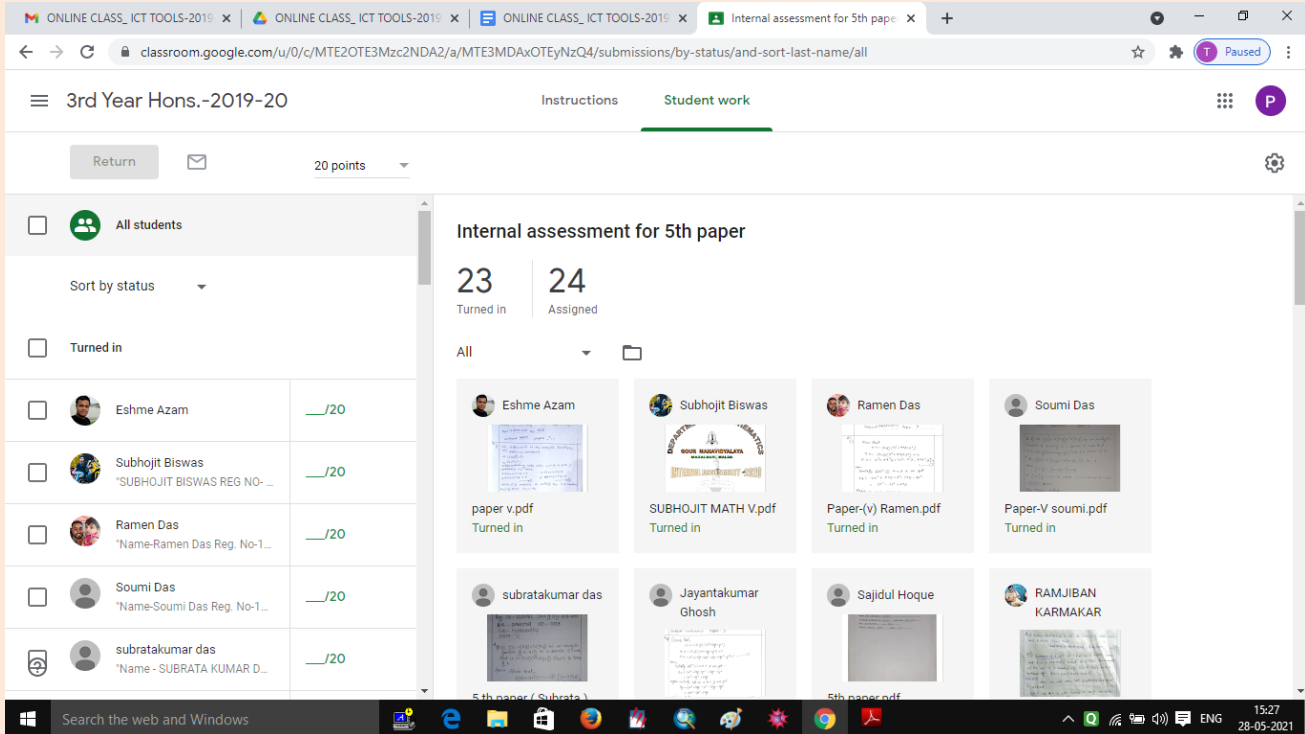


**Students submitted assignments through Google Classroom.**



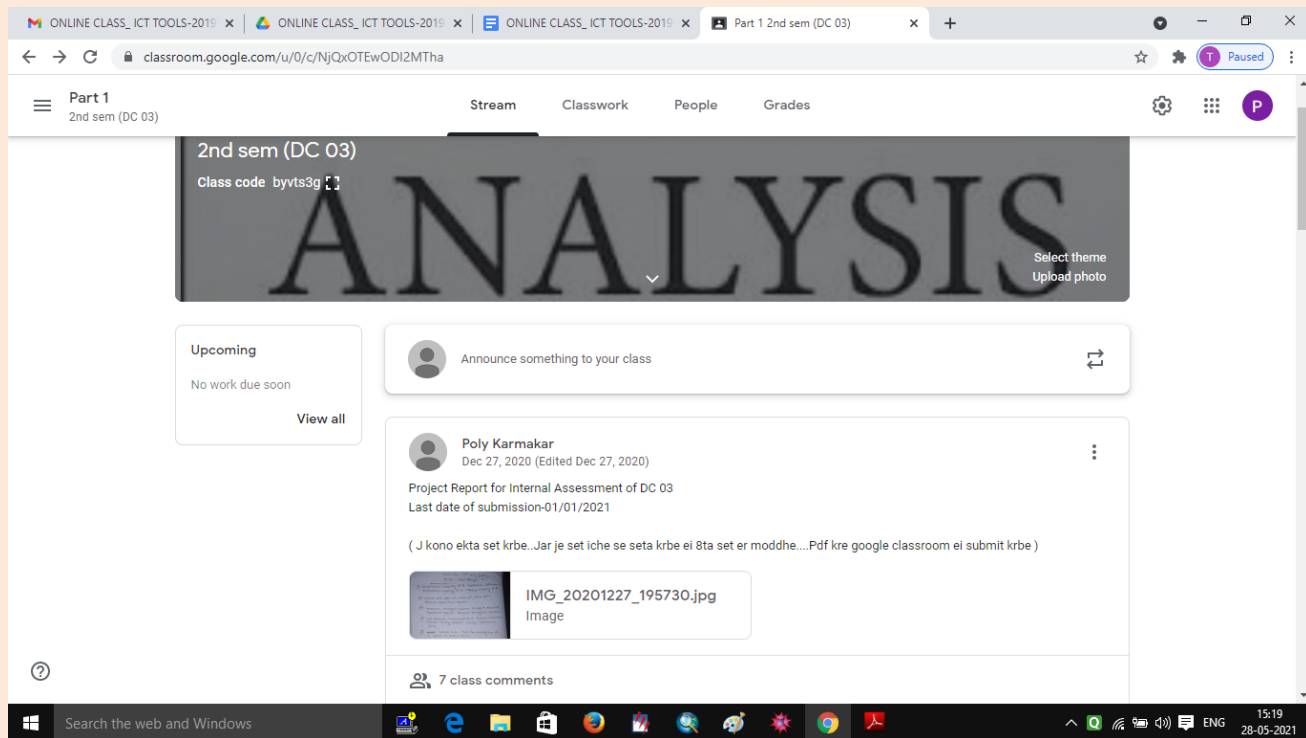


***Poly Karmakar posted an Assignment for internal assessment through Google Classroom.***

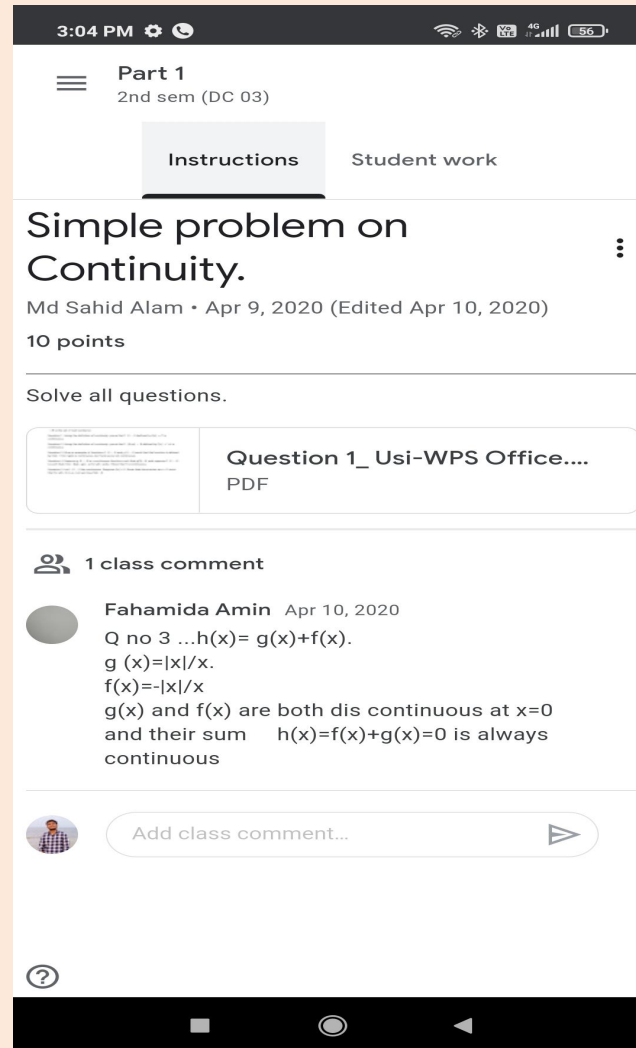


***Students submitted assignments through Google***

***Classroom.Poly Karmakar posted an questions papers for practical marks evaluation through Google Classroom on.***



***Poly Karmakar posted an Assignment for internal assessment through Google Classroom.***



*Md Sahid Alam submitted study material through Google Classroom on 09.04.2020.*

3:07 PM

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Open with Google Docs

### Bolzano's intermediate value theorem

**Lemma 1:** Suppose that  $f(x)$  is a continuous function on a closed interval  $[a, b]$  and takes the values of the opposite sign at the extremes, and there is at least one  $c$  in  $(a, b)$  such that  $f(c) = 0$ .

**Proof:** without loss of generality let  $f(a) < 0$  and  $f(b) > 0$ . We define two sequences  $\{a_n\}$  and  $\{b_n\}$  inductively:

- Let  $a_1 = a$  and  $b_1 = b$ .
- If  $f((a_n+b_n)/2) < 0$ , let  $a_{n+1} := a_n$  and  $b_{n+1} := (a_n+b_n)/2$ .
- If  $f((a_n+b_n)/2) > 0$ , let  $a_{n+1} := (a_n+b_n)/2$  and  $b_{n+1} := b_n$ .

((Figure: Finding roots (bisection method). See Figure for an example defining the first five steps.))

If  $a_n < b_n$ , then  $a_n < (a_n+b_n)/2 < b_n$ . So  $a_{n+1} < b_{n+1}$  for all  $n$ . Furthermore, as  $a_n \leq a_{n+1}$  and  $b_n \geq b_{n+1}$  for all  $n$ , that is the sequences are monotone. As  $a_n < b_n \leq b = b$  and  $b_n > a_2 = a$  for all  $n$ , the sequences are also bounded. Therefore, the sequences converge. Let  $c := \lim a_n$  and  $d := \lim b_n$ , where also  $a \leq c \leq d \leq b$ . We need to show that  $c = d$ . Notice

$$b_n - a_n = (b - a) / 2^{n-1}$$

By induction,  $b_n - a_n = (b - a) / 2^{n-1}$ . As  $2^{n-1} \rightarrow \infty$  as  $n \rightarrow \infty$ , we take the limit as  $n$  goes to infinity to get  $d - c = \lim_{n \rightarrow \infty} (b_n - a_n) = \lim_{n \rightarrow \infty} (b - a) / 2^{n-1} = 0$ .

In other words  $d = c$ . By construction, for all  $n$  we have  $f(a_n) < 0$  and  $f(b_n) > 0$ . Since  $\lim a_n = \lim b_n = c$  and as  $f$  is continuous, we may take limits in those inequalities:  $f(c) = \lim f(a_n) \leq 0$  and  $f(c) = \lim f(b_n) \geq 0$ . As  $f(c) \leq 0$  and  $f(c) \geq 0$ , we conclude  $f(c) = 0$ . Thus also  $c = a$  and  $c = b$ , so  $a < c < b$ .

**NOTE:** The Bolzano's theorem does not indicate the value or values of  $c$ , it only confirms their existence.

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3:08 PM

Part 1  
2nd sem (DC 03)

## bolzano's intermediate value theorem

Md Sahid Alam · Apr 10, 2020 (Edited Apr 10, 2020)

We proved the bolzano's intermediate value theorem. And further more we added two example according to this theorem.

IVT.pdf  
PDF

Class comments

Add class comment...

**Md Sahid Alam submitted study material through Google Classroom on 10.04.2020.**

3:10 PM

solution in the open interval  $(n, n + 1)$  where  $n$  is the positive integer .  
What is the value of  $n$ ?

Md Sahid Alam · Apr 10, 2020 (Edited Apr 10, 2020)

2 points

Hint: Use intermediate value theorem.

6 class comments

**BISHAL HALDAR** Apr 10, 2020  
n=2

**DURBA SARKAR** Apr 11, 2020  
The value off n is...2

**Fahamida Amin** Apr 12, 2020  
 $F(x)=x^5+x^3+2x-2x^4-3x^2-4$ .  
Then  $F(2)<0$   $F(3)>0$ .....so open interval(2,3).  
Therefore  $n=2$ .

**Ankita Ghosh** Apr 14, 2020  
n=2

**Sourav Ghosh** Apr 21, 2020  
n=2

**Abhishek Raha** Apr 21, 2020  
n=2

Add class comment...

3:10 PM

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Part 1  
2nd sem (DC 03)

Question Student answers

The equation  $x^5 + x^3 + 2x = 2x^4 + 3x^2 + 4$  has a solution in the open interval  $(n, n + 1)$  where  $n$  is the positive integer .  
What is the value of  $n$ ?

Md Sahid Alam · Apr 10, 2020 (Edited Apr 10, 2020)

2 points

Hint: Use intermediate value theorem.

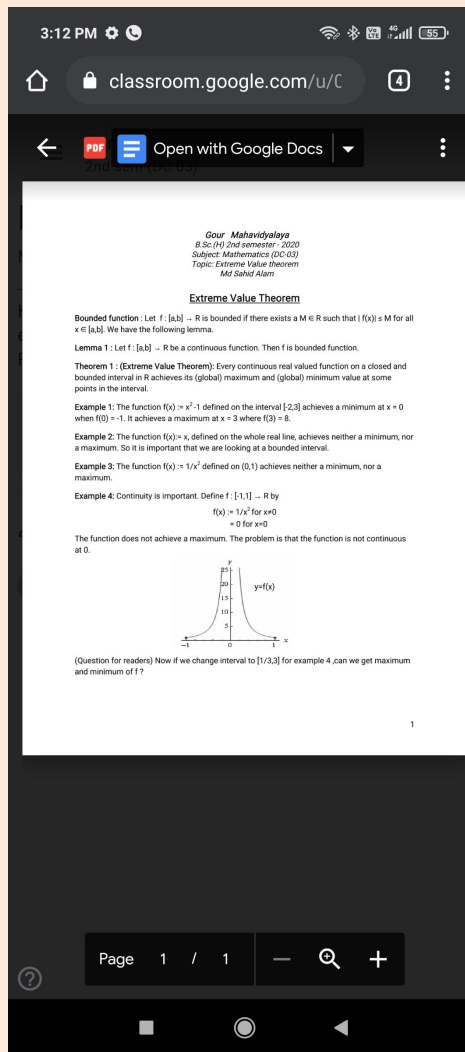
6 class comments

**BISHAL HALDAR** Apr 10, 2020  
n=2

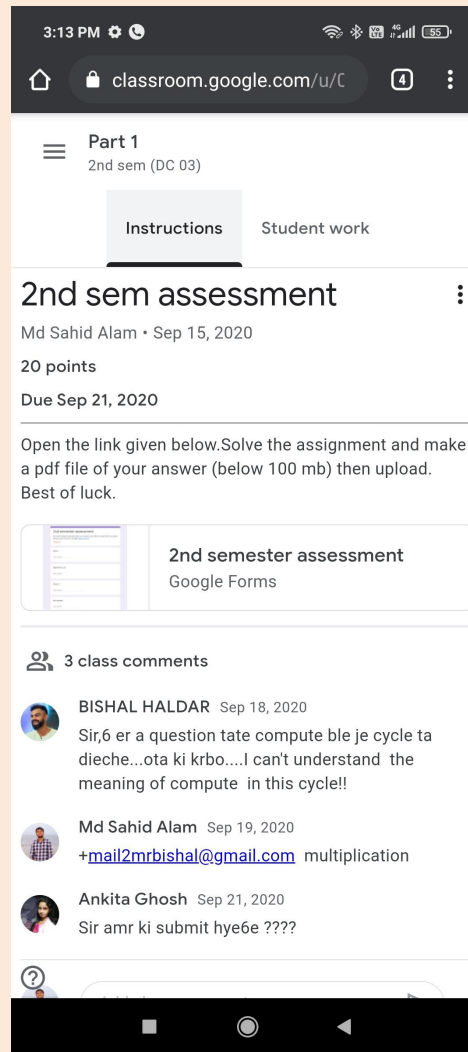
**DURBA SARKAR** Apr 11, 2020  
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 $F(x)=x^5+x^3+2x-2x^4-3x^2-4$ .  
Then  $F(2)<0$   $F(3)>0$ .....so open interval(2,3).  
Therefore  $n=2$ .

***Md Sahid Alam submitted questions through Google Classroom on 10.04.2020 and students answer.***

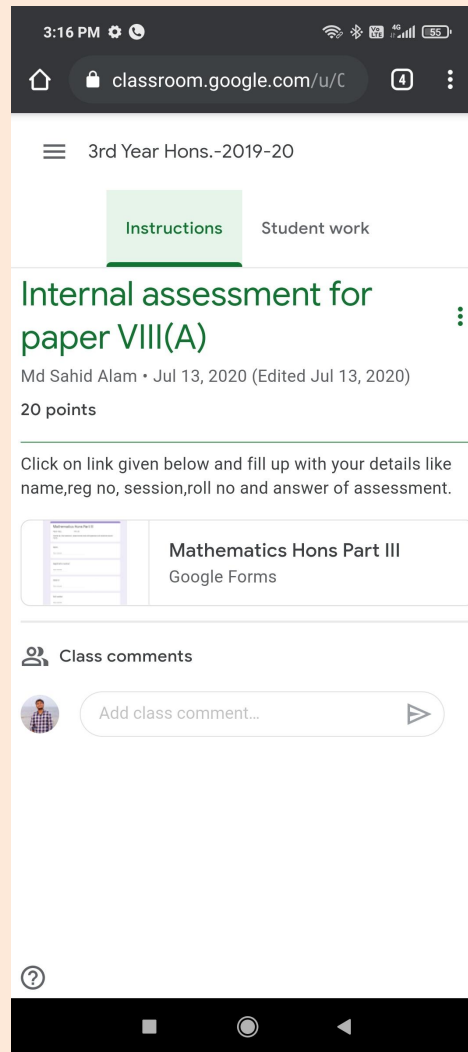


**Md Sahid Alam submitted study material through Google Classroom on 11.04.2020.**

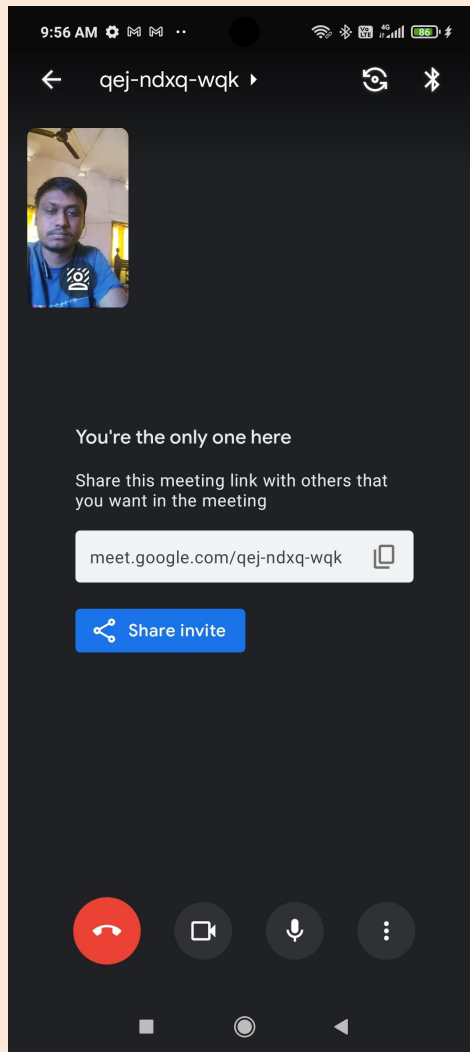


***Md Sahid Alam submitted assignment through Google Classroom .***

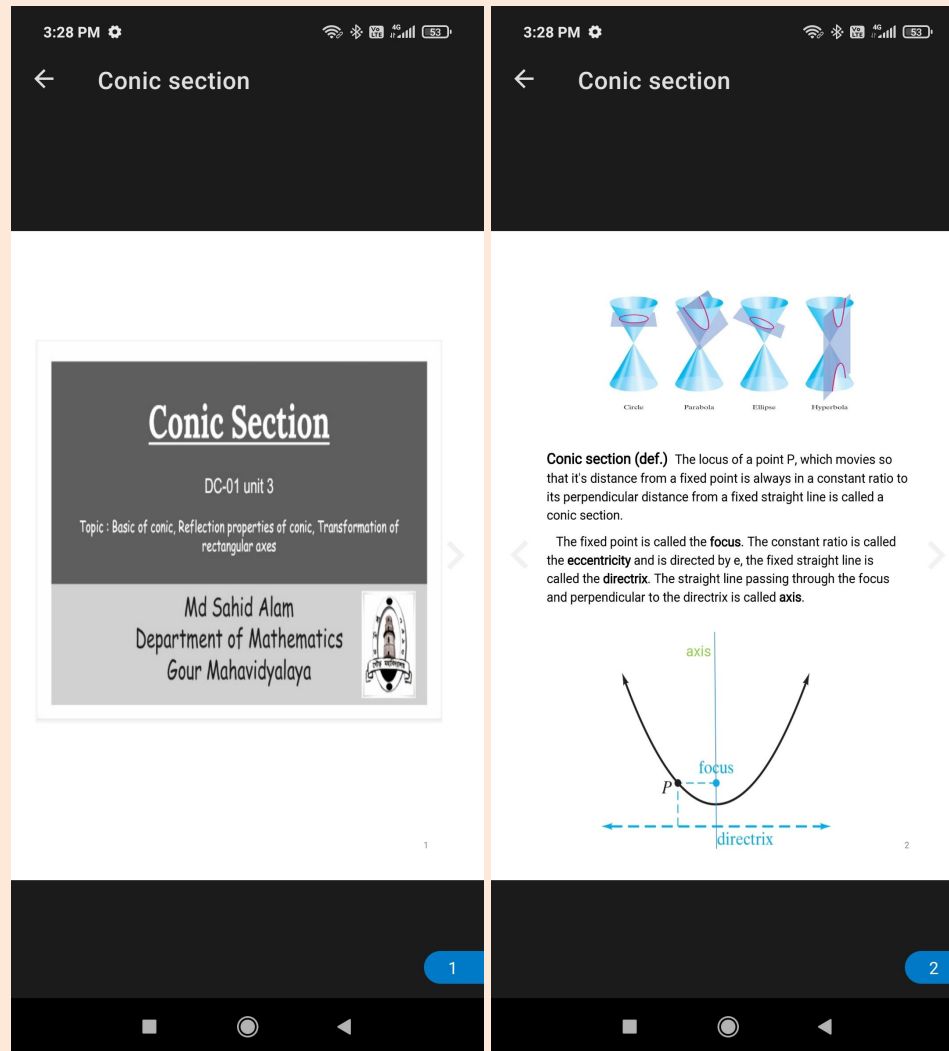




***Md Sahid Alam submitted assessment through Google Classroom .***



***Md Sahid Alam took class through Google meet .***



***Md Sahid Alam submitted study materials through teachmint app .***

3:28 PM

← Conic section

**Reflection properties of conic (visualizations):**

**Parabola:** any ray parallel to the axis of the parabola will bounce off the parabola and pass through the focus. Conversely, any ray passing through the focus will reflect off the parabola in a line parallel to the axis of the parabola (so that light emanating from the focus will reflect in a straight line parallel to the axis).

10

*Md Sahid Alam submitted study materials through teachmint app.*

3:29 PM

← Conic section

**Problem 1:** A ray emanating from the point  $(-4,0)$  is incident on the ellipse mirror  $9x^2+25y^2=225$  at the point  $p$  with abscissa 3, then the equation of the reflected ray after first reflection is  $ax+by=c$  ( $\text{hcf}(a,b,c)=1$ ), find  $|b|$ .

$9x^2 + 25y^2 = 225$   
 $\Rightarrow \frac{x^2}{25} + \frac{y^2}{9} = 1$   
 $a=5, b=3$   
 $e = \sqrt{1 - \frac{b^2}{a^2}} = \sqrt{1 - \frac{9}{25}} = \frac{4}{5}$

$F_1(0,0)$   
 $F_2(\pm 4,0)$   
 $P(3, \frac{12}{5})$   
 $(3, \frac{12}{5})$   
 $(3, -\frac{12}{5})$

$\frac{x}{5} + \frac{y}{3} = 1$   
 $m = \frac{-\frac{12}{5}}{3-4} = \frac{12}{5}$   
 $y - 0 = \frac{12}{5}(x - 4)$   
 $\Rightarrow y = \frac{12}{5}x - \frac{48}{5}$   
 $\Rightarrow 12x + 5y = -48 \quad |b| = 5$

12

3:29 PM

← Conic section

**Problem 2:** Let the focus of the parabola  $x^2=4y$  be  $F_1$  and let a point on the line  $y=1$  be  $F_2$  suppose an ellipse has its foci at  $F_1, F_2$  and is tangent to the parabola. if the tangency point has the same  $y$  value as  $F_1$ . find the distance of  $F_1F_2$ .

$x^2 = 4y$   
 $\Rightarrow x = \pm 2\sqrt{y}$   
 focus of parabola  $(0,1)$   
 Now,  $a^2 = 4$   
 $\Rightarrow x = \pm 2$   
 tangency point  $(-1, 1)$

$F_2 = (-1, 1)$   
 Since  $F_1$  is focus of parabola, light reflecting on it parallel to its axis.

$F_1F_2 = \sqrt{(0+1)^2 + (1-1)^2} = \sqrt{1} = 1$

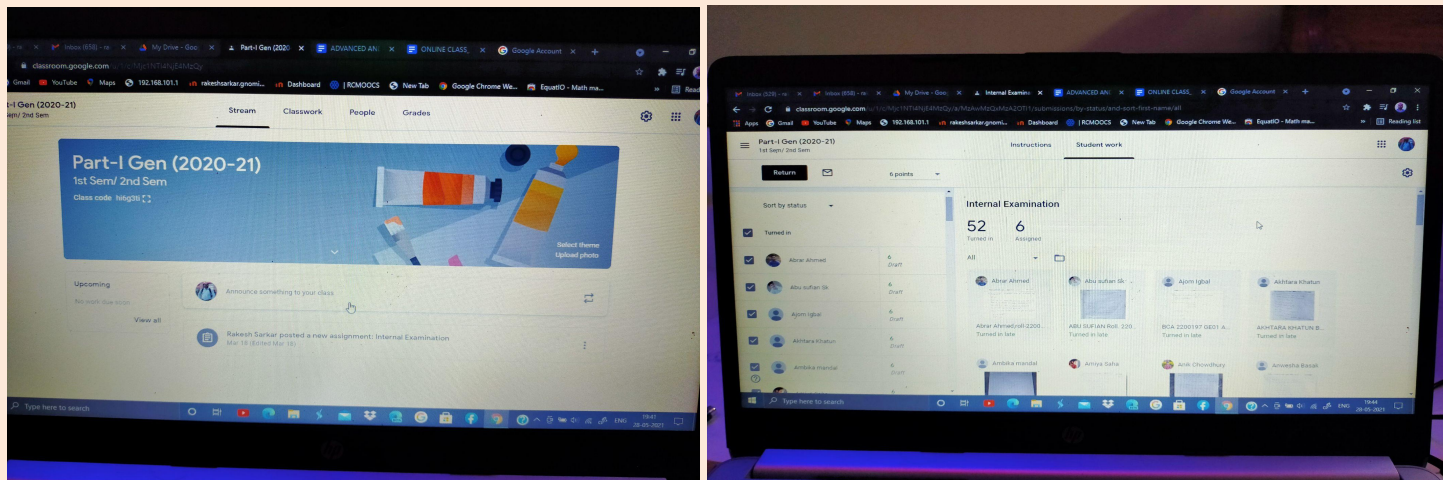
13

**Md Sahid Alam taken online class through teachmint app.**

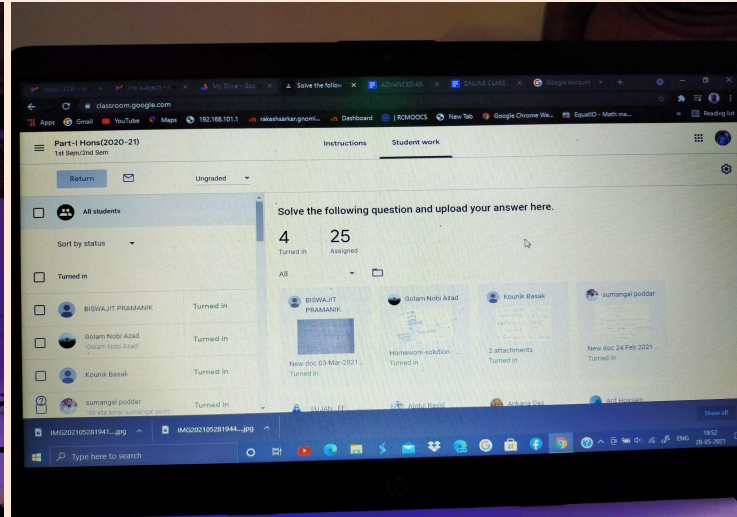
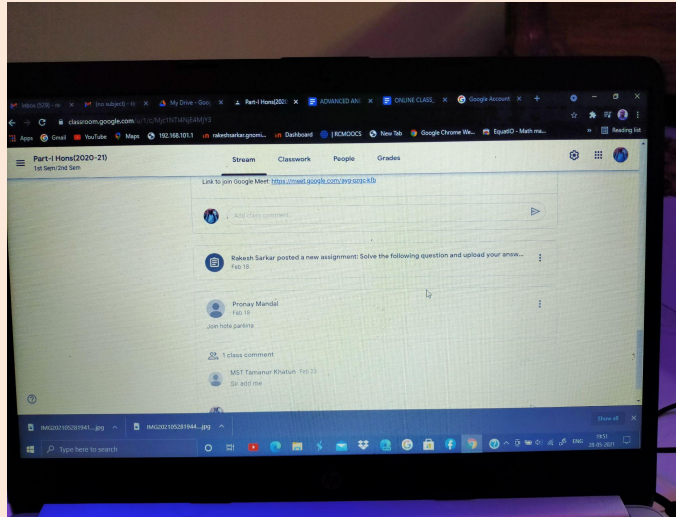
# TEACHING AND LEARNING:USE OF ICT TOOLS

## OFFLINE AND ONLINE CLASS DOCUMENTS

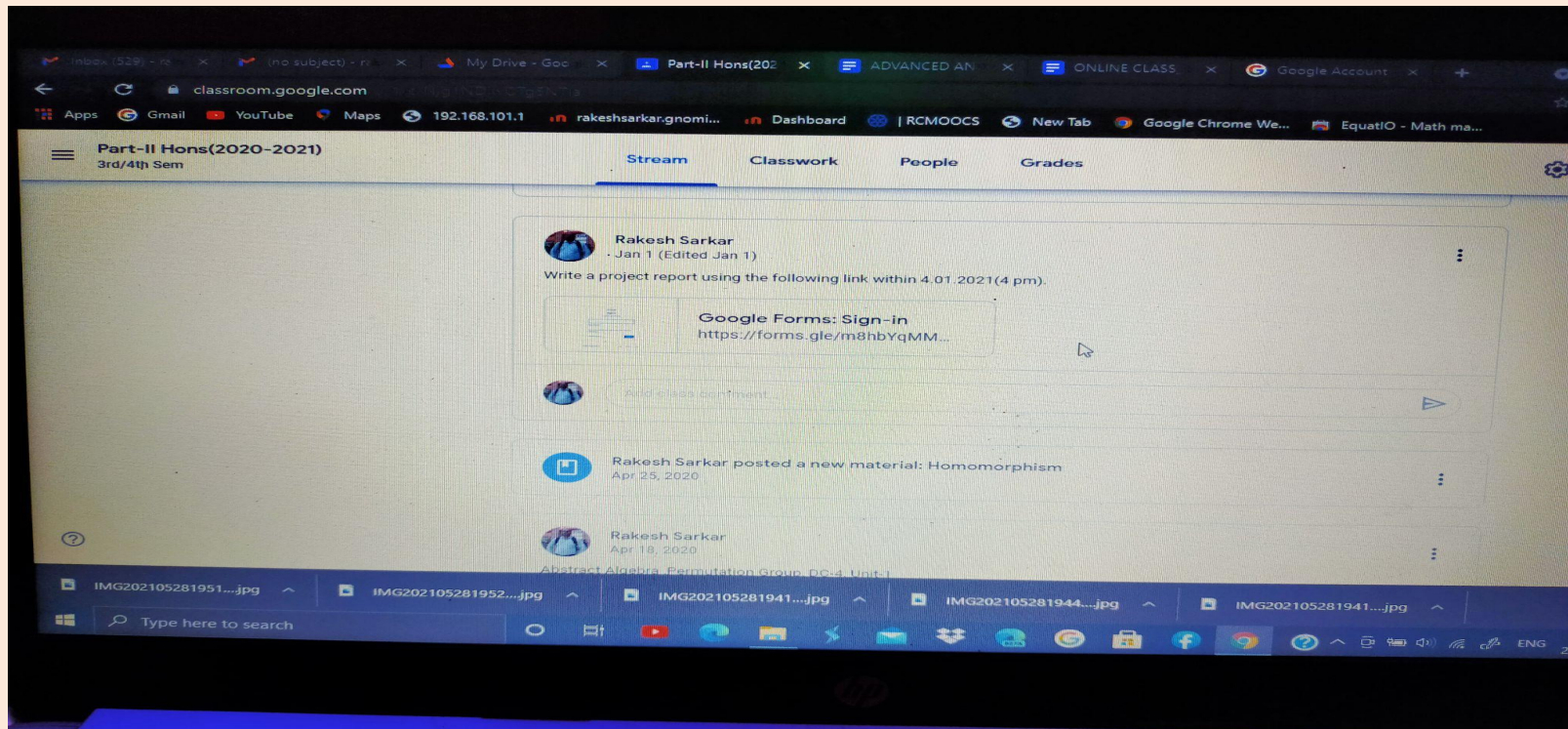
### SESSION:2020-21



**Rakesh Sarkar posted study material through Google Classroom and took the assignment on 18.03.2020**



**Rakesh Sarkar posted study material through Google Classroom and took the assignment on 18.02.2020**



**Rakesh Sarkar collected project report using Google form through Google Classroom on  
01.01.2021**



12:21

(21.05.21) 4th Sem Hons Class

You

Abhishek

Ankita

Gobinda

M 13 others

13:22

(22.05.21) 2nd Sem Hons Class

You

Prantik

Kounik

Golam Nobi

sc 7 others

13:57

(22.05.21) 2nd Sem Hons Class

You

Rejaul

Sumi

sumangal

SU 10 others

12:38

(24.05.21) 4th Sem Hons Class

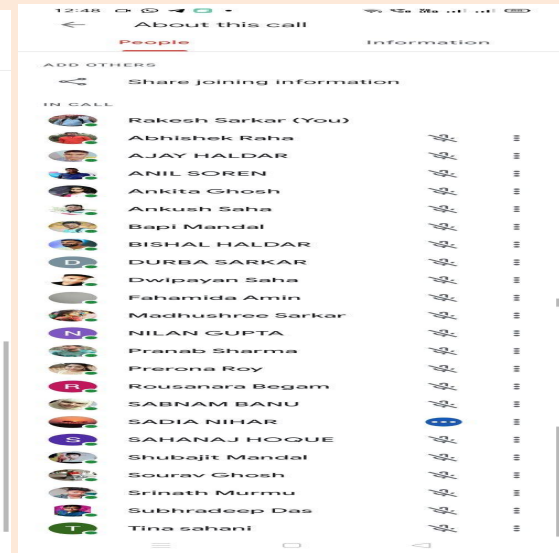
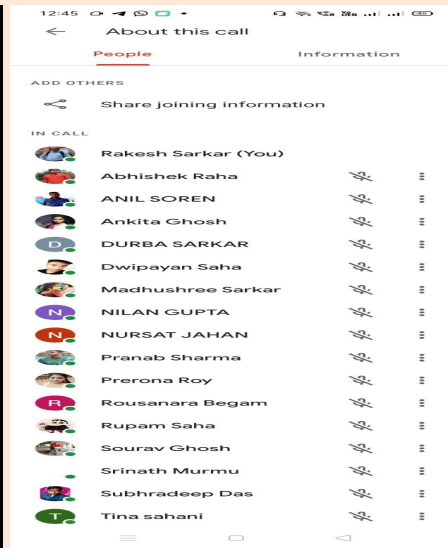
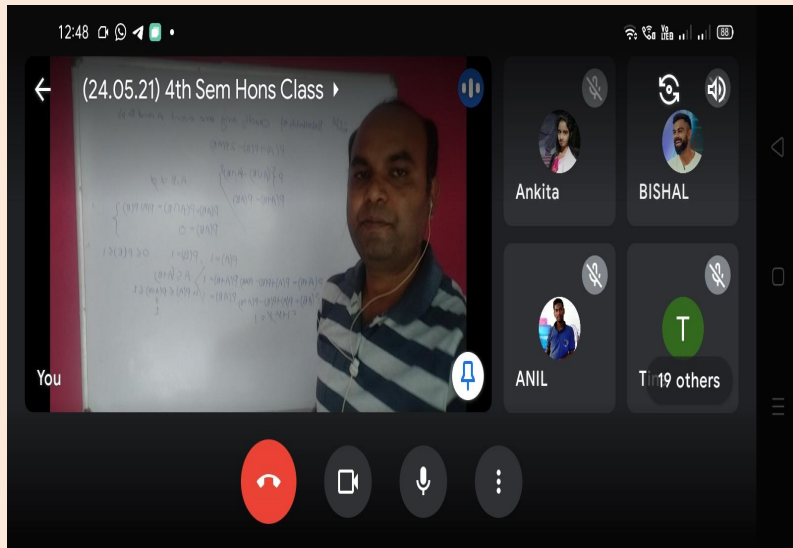
You

Ankita

BISHAL

ANIL

T 19 others



13:43

2nd Sem General Class

Mostakim

Suman

Tanbeer

And 8 others

You

Call controls: End call, Video, Microphone, More options

11:23

3rd Year General Class

Nayana

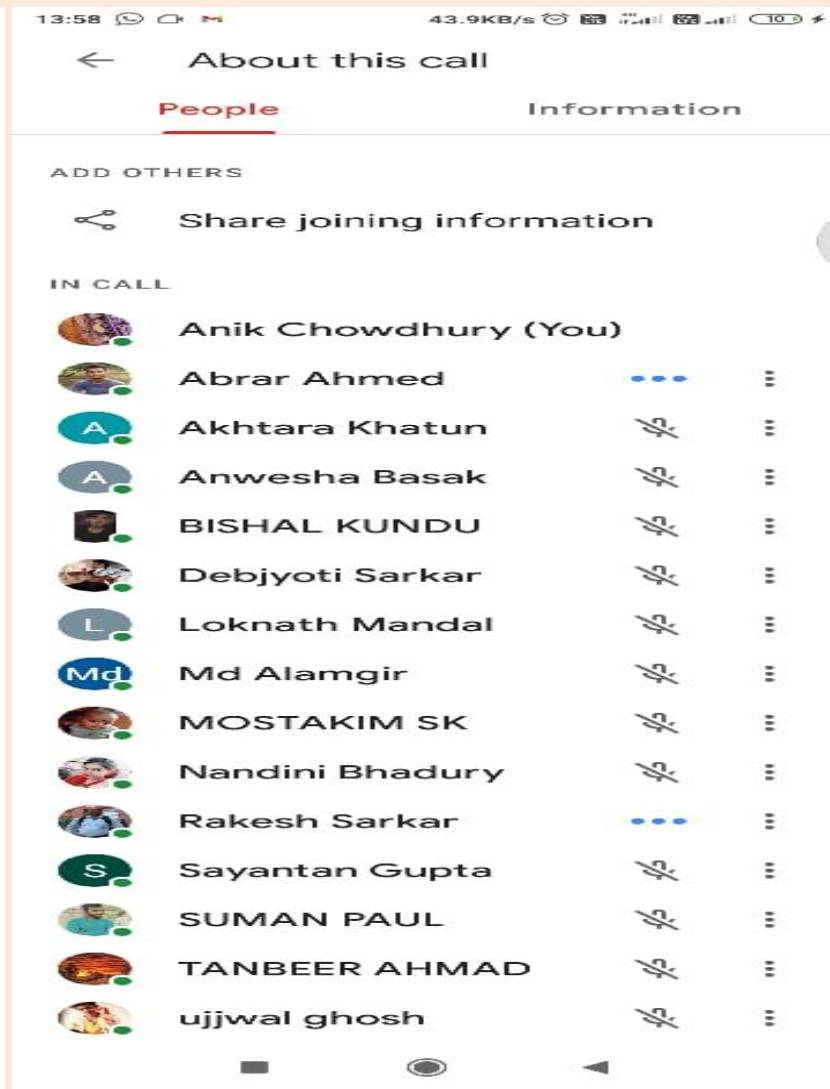
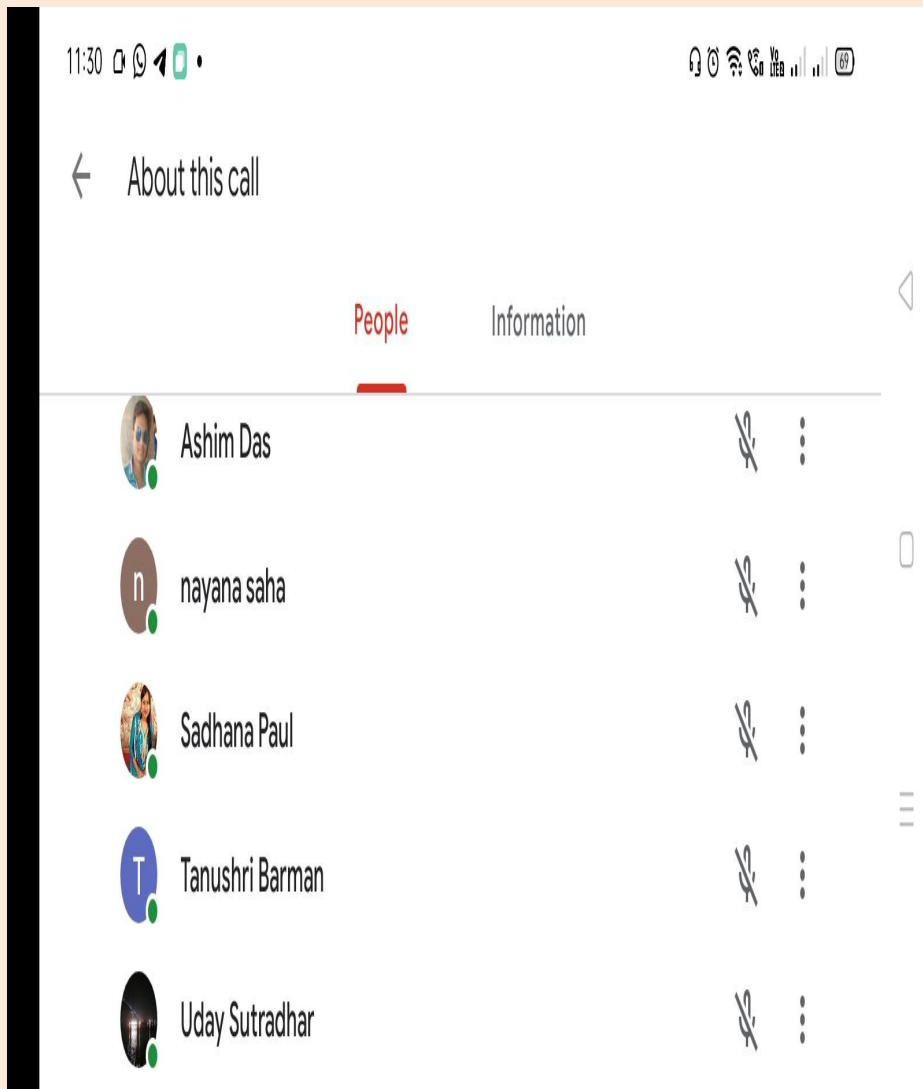
Sadhana

Tanushri

3 others

Rakesh Sarkar

Call controls: End call, Video, Microphone, More options



**Rakesh Sarkar took the online classes through Google Meet as recorded in the picture.**

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1 (1 of 18) 177%


Tools Sign Comment

Mathematics (Hons.) 2nd semester, 2020-2021.

# MATH-H-DC04 Group Homomorphisms

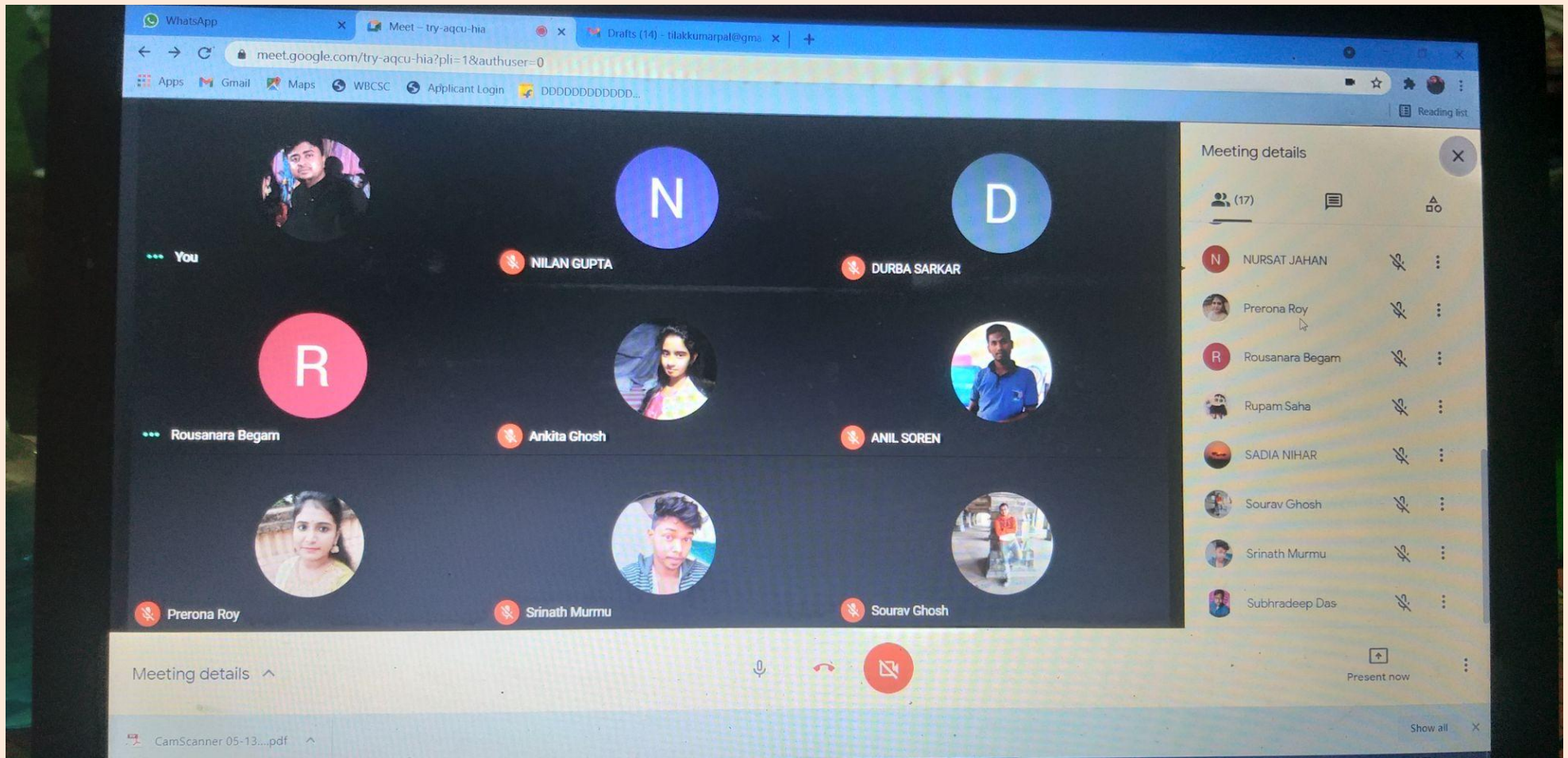
Course code: MATH-H-DC04

Online class presented  
by  
**Tilak Kumar Pal**  
Department of Mathematics  
Date: 21-05-2021



Windows taskbar: Search for anything, File Explorer, Mail, Photos, DVI, PDF, Chrome, 3:51 PM, 21-May-21

**Tilak Kumar Pal taken class through Google meet on 21-5-2021.**



**Tilak Kumar Pal took class through Google meet on 05-04-2021.**

Grid view of a Google Meet session with 9 participants:

- Top-left: You (video on)
- Top-middle: Placeholder (grey circle)
- Top-right: Pranab Sharma (video on)
- Middle-left: Abhishek Raha (video on)
- Middle-middle: NILAN GUPTA (video off, blue circle with 'N')
- Middle-right: NURSAT JAHAN (video off, red circle with 'N')
- Bottom-left: MD ARIF (video off, blue circle with 'MD')
- Bottom-middle: Rousanara Begam (video off, pink circle with 'R')
- Bottom-right: Prerona Roy (video on)

### Meeting details

(18) [chat icon] [share icon]

+ Add people

IN CALL

- Tilak kumar pal (You) [more icon] [mute icon]
- Abhishek Raha [mute icon] [more icon]
- Ankita Ghosh [mute icon] [more icon]
- Azad Hossain [mute icon] [more icon]
- BISHAL HALDAR [mute icon] [more icon]
- DURBA SARKAR [mute icon] [more icon]
- Dwipayan Saha [mute icon] [more icon]
- Fahamida Amin [mute icon] [more icon]

Meeting details ^ [mute icon] [video off icon] [present now icon]

# Tilak Kumar Pal taken class through Google meet on 06-05-2021

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2 (2 of 18) 177%

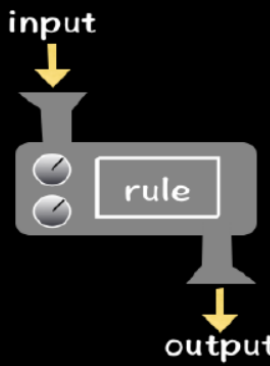
Tools Sign Comment

Mathematics (Hons.) 2nd semester, 2020-2021.

What is a functions

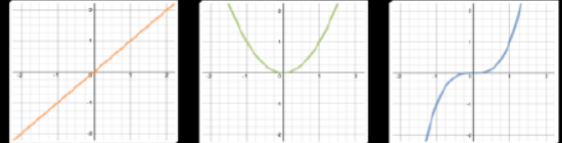
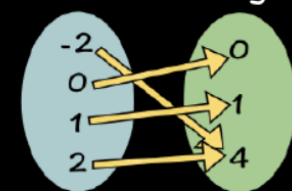
## Function

### What is a function?



x	y
-2	-3
-1	-1
0	1
1	3
2	5

domain range



$f(x) = 2x + 1$

mathycathy.com/blog

9:07 PM 28 May-21



**Tilak Kumar Pal took class through Google Meet on 02-03-2021.**

Drafts (26) - tilakkumarpal@gmail.com x ONLINE CLASS\_ ICT TOOLS-2019 x ONLINE CLASS\_ ICT TOOLS-2019 x (1) WhatsApp x Part-II Hons(2020-2021) 3rd/4th Sem x

classroom.google.com/u/0/c/Njg1NDlwOTg5NTla

Apps Gmail Maps WBCSC Applicant Login DDDDDDDDDDD...

Part-II Hons(2020-2021)  
3rd/4th Sem

Stream Classwork People Marks

Tilak kumar pal  
13 May

All the students of 4th sem (Hons.) are requested to attend online class through Google meet on 13th may at 1:00 PM.  
Course - DC 08  
Topic -Differential equations (unit - 1)  
Link should be provided on that time.

Add class comment...

Tilak kumar pal  
8 May

All the students of 4th sem (Hons.) are requested to attend online class through Google meet on 8th may at 3:00 PM.  
Course - DC 08  
Topic -Differential equations (unit - 1)  
Link should be provided on that time.

Add class comment...

Tilak kumar pal  
6 May

Search for anything

8:33 PM  
28-May-21

***Tilak Kumar Pal, Announcement for class through Google Meet on 08-05-2021.***



7:33 PM

← internal dc 01 2021n.pdf

**Gour Mahavidyalaya**  
Department of mathematics  
Internal examination  
Time : 1 hour Paper : DC 01 FM 20

**Group A** 1x10=10

(1) Given  $7x \leq f(x) \leq 3x^2+2$  for all  $x$ , then limit  $f(x)$  at 2  
(a) 0 (b) 7 (c) 14 (d) 21.

(2) For what value of  $x$ ,  $f(x) = 3x^4-4x^2$  is continuous?  
(a) (-1,1) (b) (0,∞) (c) (-∞,0) (d) (-∞,∞).

(3) Inflection points and interval of concave upward of  $f(x)=2x^3-12x^2+4x+27$  are respectively  
(a) 2 and (2,∞) (b) 2 and (-∞,2) (c) 3 and (3,∞) (d) 3 and (-∞,3).

(4)  $\Gamma(1/2) =$  (a)  $\pi$  (b)  $\sqrt{\pi}$  (c)  $\sqrt{2\pi}$  (d)  $2\pi$ .

(5) limit of  $x/\tan x$  as  $x$  approaches 0 is (a) 0 (b) 1 (c) 2 (d) 4

(6) if under rotation  $ax^2 + 2hxy + by^2 + 2gx + 2fy + c$  takes the form  $a'x'^2 + 2h'xy' + b'y'^2 + 2g'x' + 2f'y' + c'$  then (a)  $a'+b'=a+b$  (b)  $a'a' = b'b'$  (c)  $ab-h^2 = a'b'-h'^2$  (d)  $h'h'$ .

(7)  $x^2+kxy-2y^2+3y-1=0$  represents a pair of straight lines, value of  $k$  is  
(a) 0 (b) 1 (c) 2 (d) 3.

(8) Polar form of the equation  $x^2+y^2-2ax=0$  is  
(a)  $r = a \cos \theta$  (b)  $r = a \cos 2\theta$  (c)  $r = 2a \cos \theta$  (d)  $r = 2a \cos 2\theta$ .

(9)  $9x^2-6xy+y^2-14x+2y+12=0$  represents  
(a) parabola (b) ellipse (c) pair of straight lines (d) hyperbola.

(10) centre and radius of the sphere  $x^2+y^2+z^2+2x-4y+6z+5=0$  are respectively  
(a) (-1,2,3), 2 units (b) (-1,2,3), 3 units (c) (1,-2,3), 2 units (d) (1,-2,3), 3 units

**Group B**  
(Answer any two) 5x2=10

7:33 PM

← internal dc 01 2021n.pdf

**Group B**  
(Answer any two) 5x2=10

(1) If  $I_n = \int \tan^n x dx$  then show that  $I_n + I_{n-2} = \tan^{n-1} x / (n-1)$

(2)  $y = e^m \sin(ax+b)$  then find the value of  $y$ .

(3) (a) the origin shifted to the (3,-1) and co-ordinate axes are then rotated through an angle  $\tan^{-1} 3/4$ . find the coordinates of the point (5,2) in the new co-ordinate system.  
(b) Find the equation of the plane passing through (2,3,10) and through z-axis.

(4) If one of the straight lines  $ax^2 + 2hxy + by^2 = 0$  coincides with one of the straight lines  $ax^2 + 2h'xy + b'y^2 = 0$  and remaining two straight lines are at right angle so that  $h(1/b - 1/a) = h'(1/b' - 1/a')$ .

2/2

7:33 PM

←

Instructions Student work

**Internal examination**  
20 points

Submit hard copy of your answer script.

**Attachments**

Time	Name	Internal examination	Page	DC 01	FM 20
10:00:00	10:00:00	10:00:00	10:00:00	10:00:00	10:00:00










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Add class comment

7:33 PM 📶 4G 59%

← 20 points ▾ 🔄 ⋮

Instructions Student work

21	8
Handed in	Assigned
<input type="checkbox"/>	HANDED IN
<input type="checkbox"/> 	Abdul Rasid <span>Handed in</span>
<input type="checkbox"/> 	Ankana Das <span>Handed in</span>
<input type="checkbox"/> 	BISWAJIT PRAMANIK <span>Handed in</span>
<input type="checkbox"/> 	Ekta Talukdar <span>Handed in</span>
<input type="checkbox"/> 	Golam Nobi Azad <span>Handed in</span>
<input type="checkbox"/> 	Khalid Hasan <span>Handed in</span>
<input type="checkbox"/> 	Kounik Basak <span>Handed in</span>
<input type="checkbox"/> 	Kunal Roy <span>Handed in</span>
<input type="checkbox"/> 	

— 

7:39 PM

← Conic section

Problem 2 If by rotation of the rectangular axes the equation  $14x^2 - 4xy + 11y^2 = 60$  reduces to the form  $\frac{x'^2}{a} + \frac{y'^2}{b} = 1$ , find  $a$  and  $b$ ; find also the angle through which the axes are rotated.

Solution.

Let  $\theta$  be the angle of rotation. Then by usual transformation rule

$$\begin{aligned} x &= x' \cos \theta - y' \sin \theta \\ y &= x' \sin \theta + y' \cos \theta \end{aligned}$$

Putting these values of  $x, y$  in the equation  $14x^2 - 4xy + 11y^2 = 60$ , we get

$$14(x' \cos \theta - y' \sin \theta)^2 - 4(x' \cos \theta - y' \sin \theta)(x' \sin \theta + y' \cos \theta) + 11(x' \sin \theta + y' \cos \theta)^2 = 60$$

or,  $14(x'^2 \cos^2 \theta + y'^2 \sin^2 \theta - x'y' \sin 2\theta) - 4\left(\frac{x'^2}{2} \sin 2\theta - x'y' \cos 2\theta - \frac{y'^2}{2} \sin 2\theta\right) + 11(x'^2 \sin^2 \theta + y'^2 \cos^2 \theta + x'y' \sin 2\theta) = 60$

or,  $x'^2 \{14 \cos^2 \theta - 2 \sin 2\theta + 11 \sin^2 \theta\} + y'^2 \{14 \sin^2 \theta + 2 \sin 2\theta + 11 \cos^2 \theta\} - x'y' \{4 \cos 2\theta + 3 \sin 2\theta\} = 60$

Since the equation reduced to the form

$$\frac{x'^2}{a} + \frac{y'^2}{b} = 1 \quad (1)$$

the coefficients of  $x'y'$  must vanish.

Hence

$$\begin{aligned} 4 \cos 2\theta + 3 \sin 2\theta &= 0 \\ \text{or } \frac{\sin 2\theta}{4} &= \frac{\cos 2\theta}{-3} = \frac{1}{5} \end{aligned} \quad (2)$$

So

$$\sin 2\theta = \frac{4}{5}, \quad \cos 2\theta = -\frac{3}{5}, \quad \frac{\pi}{2} < 2\theta < \pi$$

19

7:39 PM

← DC01

Chat Notice Board **Assignments** Study Material

+

Post assignments and see what's due in the coming week

Create Assignment

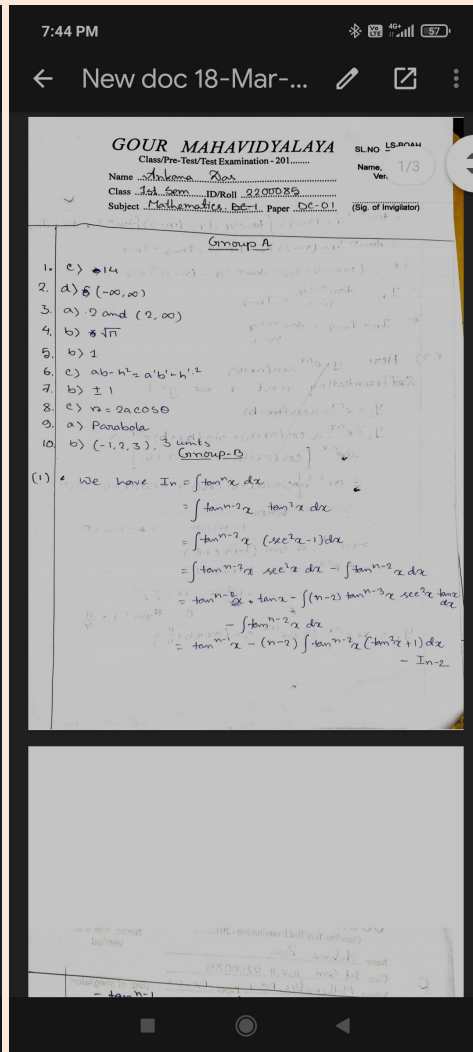
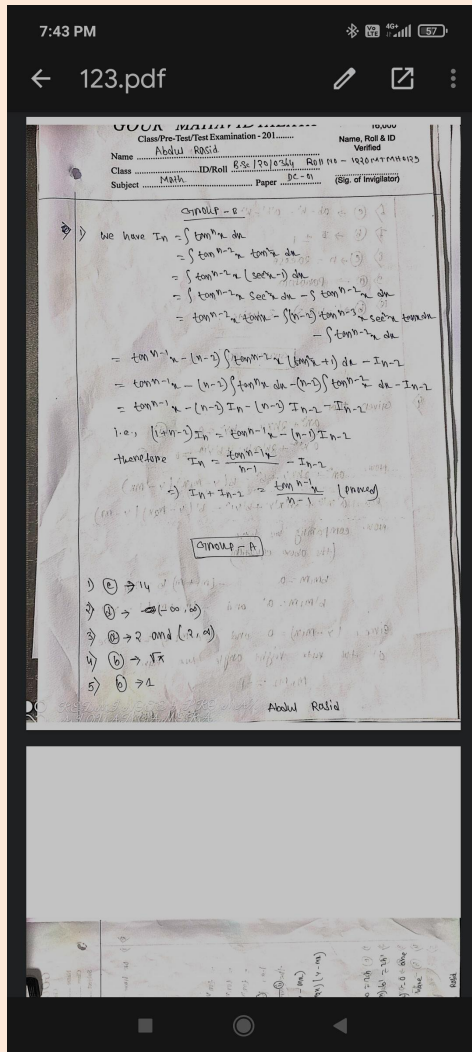
Transformation Of Rectangular Axes.

06 Mar 2021 11:59 pm

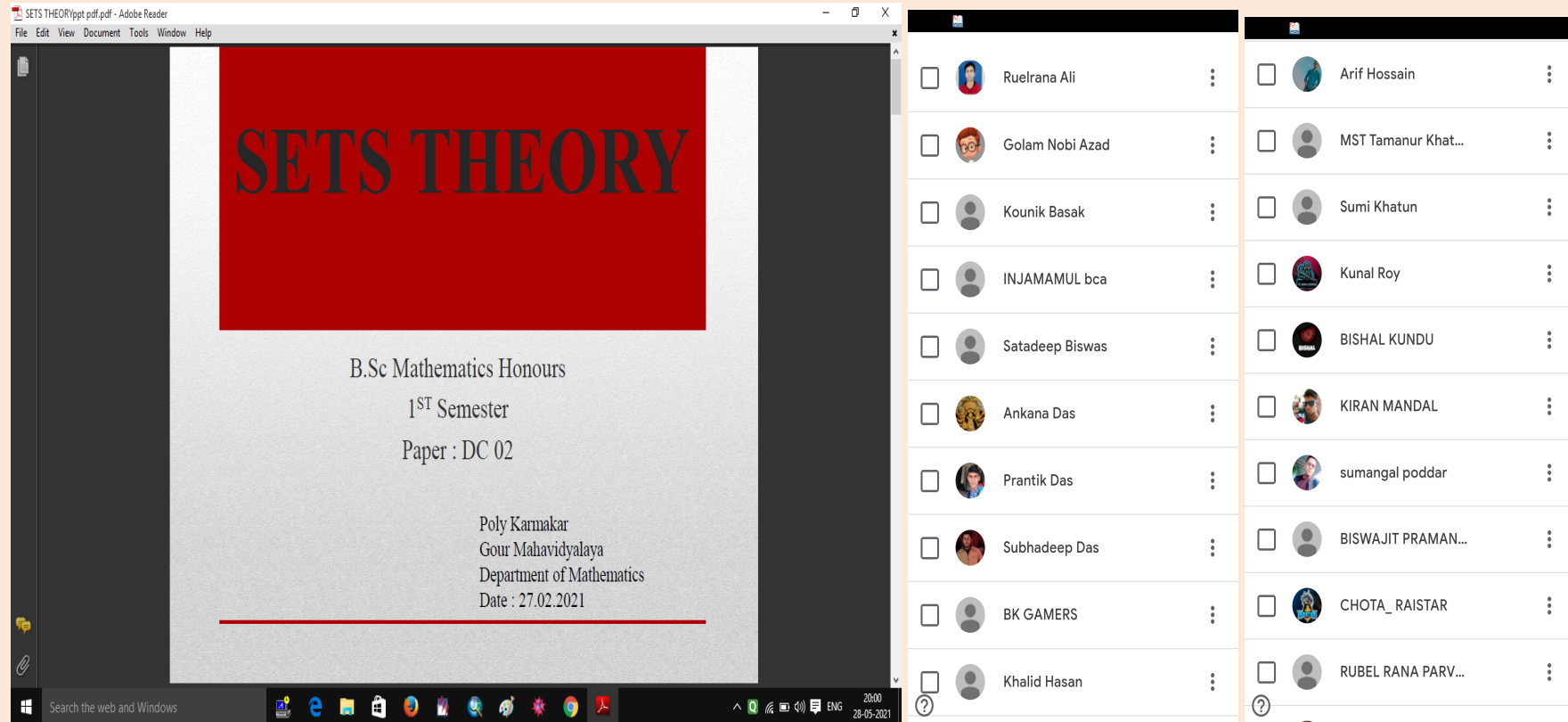
Max Marks: 20

View Submissions Add/Edit Solution

**Md Sahid Alam took class on teachemint app on 06.03.2021**



***Students submitted answer scripts through google classroom.***



***Poly Karmakar took class through Google Meet on 27.02.2021.***




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Mathematics (Hons.) 2nd Sem, 2020-2021.

# DC 03 Limits

Online class presented  
by  
**Poly Karmakar**  
Department of Mathematics  
Gour Mahavidyalaya  
Date : 12.05.2021



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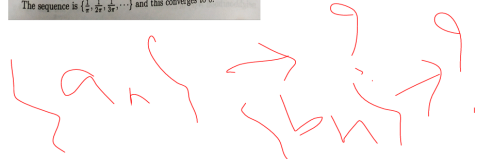
Comment

Mathematics (Hons.) 2nd Sem, 2020-2021.  
Limits

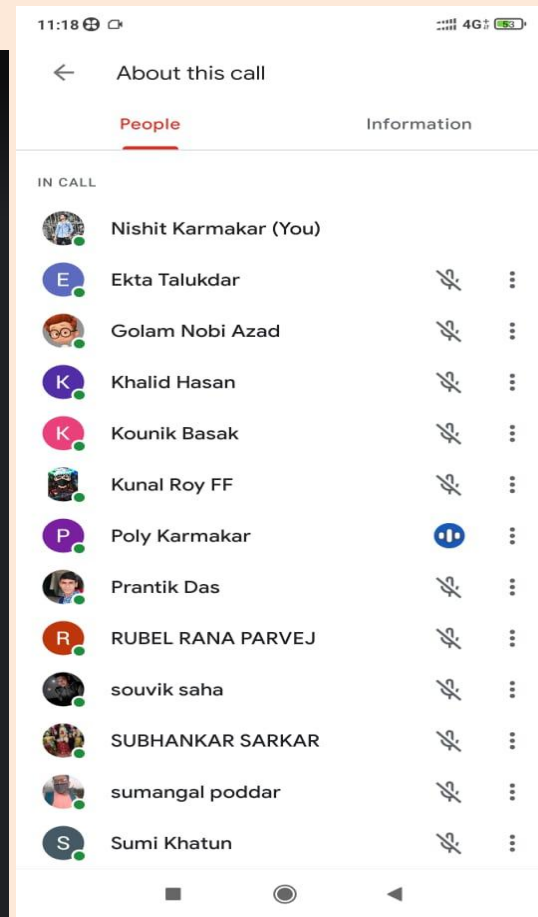
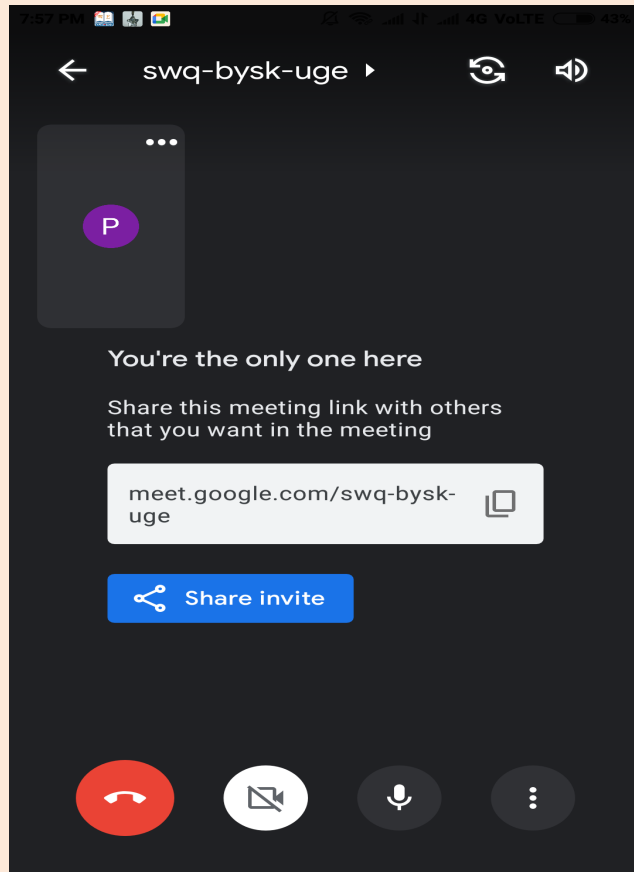
### Example

4. Prove that  $\lim_{x \rightarrow 0} f(x)$  does not exist where  $f(x) = \sin \frac{1}{x}$ ,  $x \neq 0$ .

Here the domain  $D$  of  $f$  is  $\mathbb{R} - \{0\}$ . 0 is a limit point of  $D$ .  
Let us consider the sequence  $\{x_n\}$  in  $D$  defined by  $x_n = \frac{2}{(n-1)\pi}$ ,  $n \in \mathbb{N}$ .  
The sequence is  $\{\frac{2}{\pi}, \frac{2}{2\pi}, \frac{2}{3\pi}, \dots\}$  and this converges to 0.  
The sequence  $\{f(x_n)\}$  is  $\{\sin \frac{\pi}{2}, \sin \frac{\pi}{3}, \sin \frac{\pi}{4}, \dots\}$ , i.e.,  $\{1, 1/2, 1/3, \dots\}$  and this converges to 0.  
Let us consider the sequence  $\{y_n\}$  in  $D$  defined by  $y_n = \frac{1}{(n-1)\pi}$ ,  $n \in \mathbb{N}$ .  
The sequence is  $\{\frac{1}{\pi}, \frac{1}{2\pi}, \frac{1}{3\pi}, \dots\}$  and this converges to 0.



11



*Poly Karmakar took class through Google Meet on 12.05.2021.*

SETS THEORYppt 1.pdf - Adobe Reader

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# SETS THEORY

B.Sc Mathematics (General)  
4th Semester  
Course : SEC-02 (Unit-2 & Unit-3)

Online class presented by  
**Poly Karmakar**  
Department of Mathematics  
Gour Mahavidyalaya  
Date : 15.05.2021

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11:12  
15-05-2021

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11:09 AM

MIRIDUL MANDAL, Poly Karmakar, Ranjit Soren, Bijoy Mondal, Tapash Sarkar, Anup Sarkar, Barnali paul, Afa Anjum, Manoranjan Sen

Meeting details

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11:09 15-05-2021

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11:09 AM

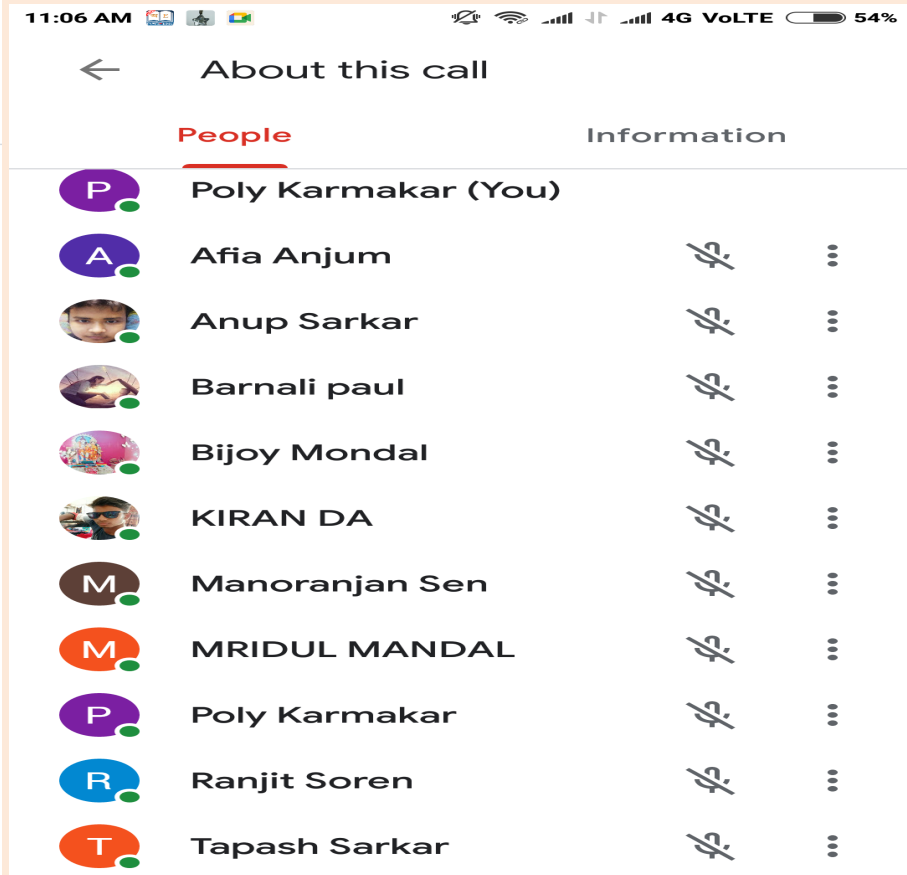
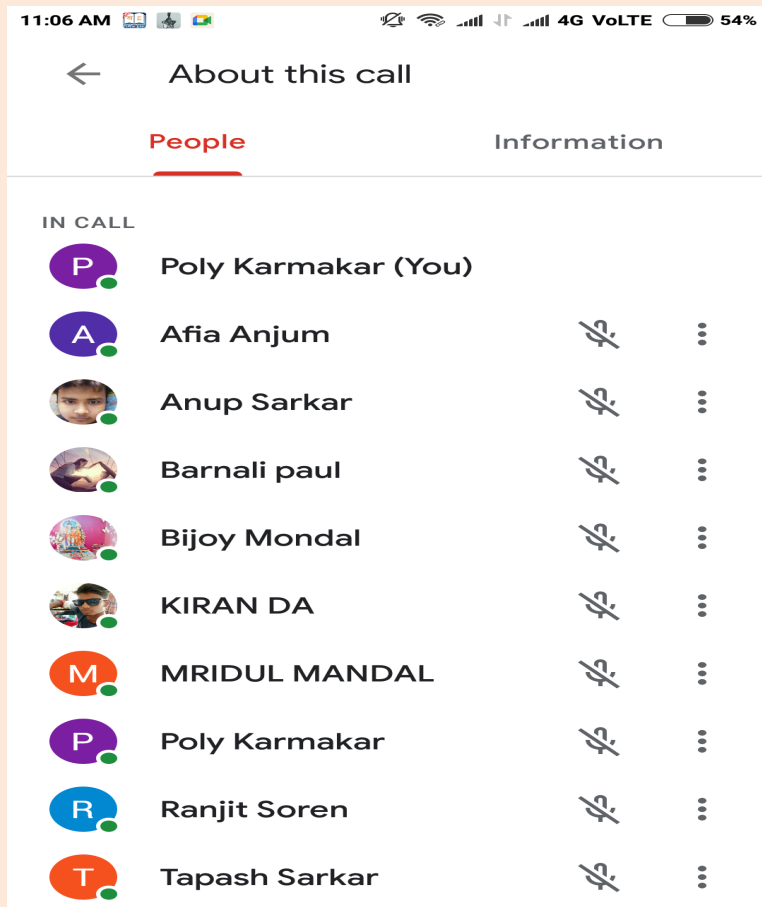
MIRIDUL MANDAL, Poly Karmakar, Ranjit Soren, Bijoy Mondal, Tapash Sarkar, KIRAN DA, Afa Anjum, Manoranjan Sen

Joining info  
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Meeting details

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Mathematics (General) 4th semester, 2021.

# Paper-SEC- 02 Relation

Online class presented  
by  
**Poly Karmakar**  
Department of Mathematics  
Gour Mahavidyalaya



Date- 21/05/2021

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21-05-2021

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Meeting details

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11:10 21-05-2021

meet.google.com/goa-qaiu-end

11:10 AM

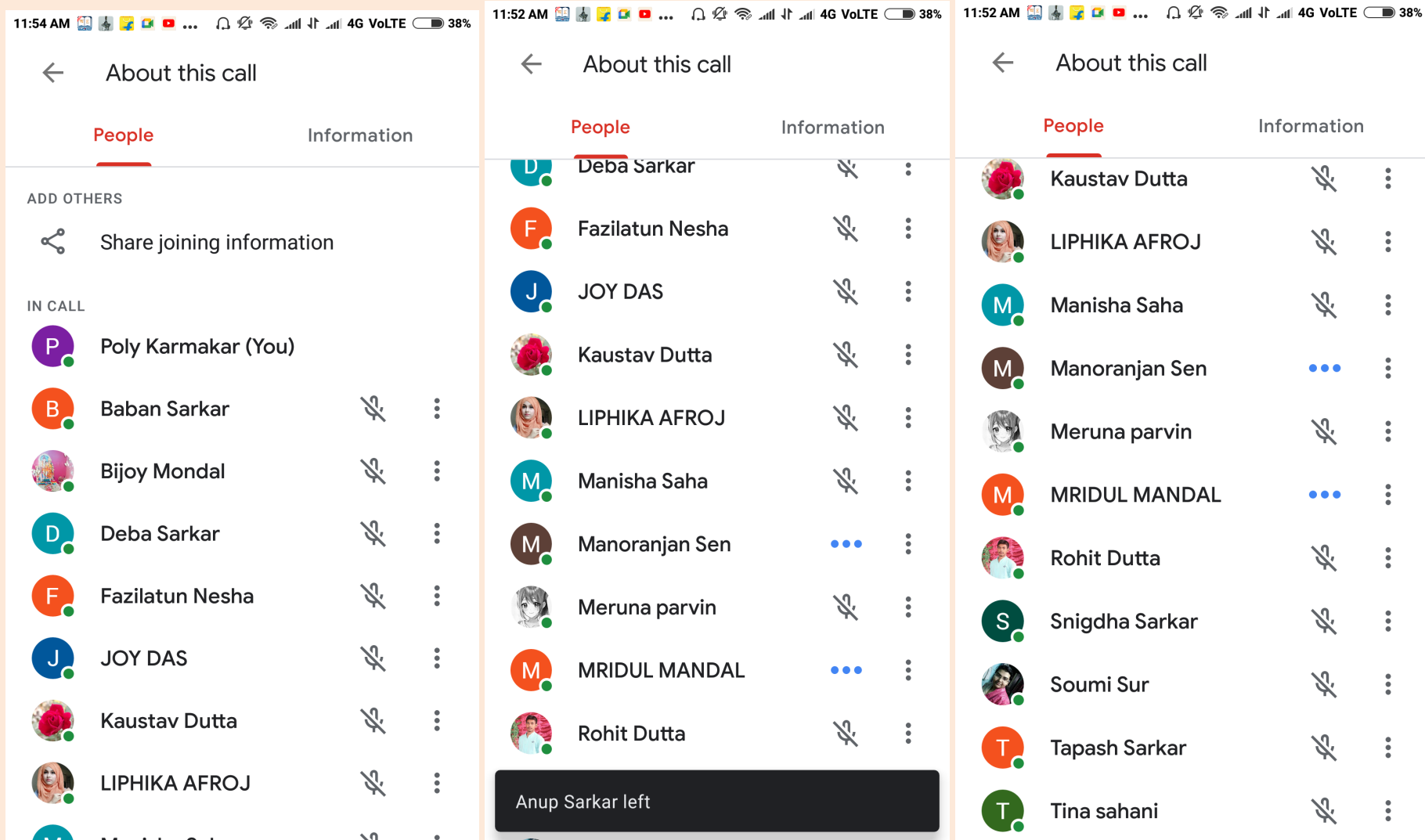
To see more people, change your layout to show more tiles

Change layout

Meeting details

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11:10 21-05-2021



*Poly Karmakar took class through Google Meet on 21.05.2021.*

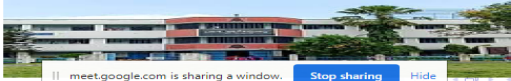


4th sem.pdf - Adobe Reader  
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Mathematics (Hons.) 4th semester, 2020-2021.

**DISCIPLINE CORE COURSE-08(DC-08)**  
**Differential Equations**  
**Unit-4**

Online class presented  
by  
**Poly Karmakar**  
Department of Mathematics  
Gour Mahavidyalaya  
**Date- 22/05/2021**



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22-05-2021

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Subhradeep Das Poly Karmakar DURBA SARKAR Dwipayen Saha

Gobinda Das AJAY HALDAR saeda tabassum

Meeting details ^

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11:03 22-05-2021

meet.google.com/cww-tjgi-cjq 11:08 AM

Subhradeep Das NURSAT JAHAN Gobinda Das

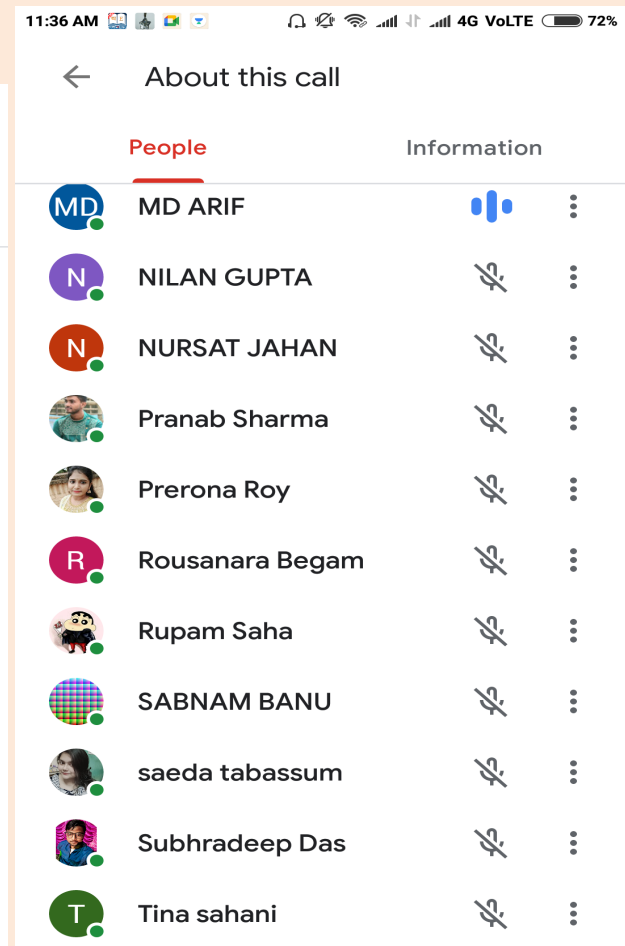
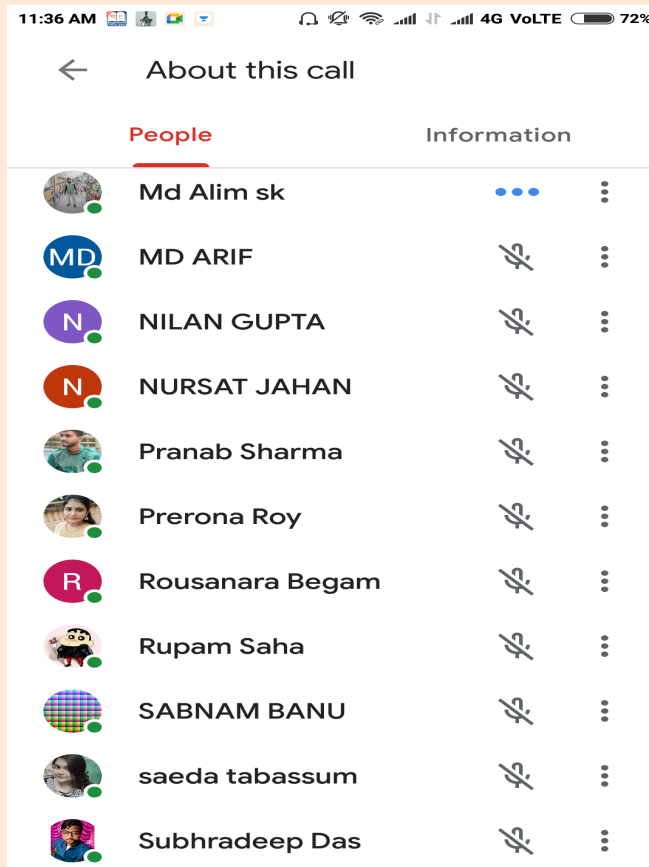
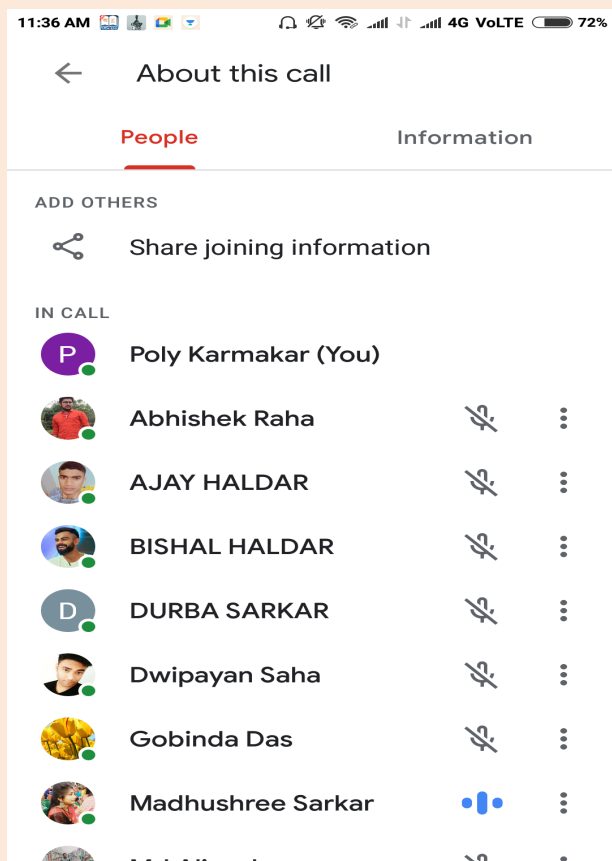
AJAY HALDAR Tina sahani Abhishek Raha

Sourav Ghosh Poly Karmakar saeda tabassum

Meeting details ^

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11:08 22-05-2021



*Poly Karmakar took class through Google Meet on 22.05.2021.*

Rakesh Samra  
27. 05. 2021

Tilak Kumar Pal  
27/05/2021

Poly karmakar.

27.05.2021

Md Sabid Alam

27.05.21

