

ST. THOMAS COLLEGE, PALAI

**UGC APPROVED COLLEGE WITH POTENTIAL FOR EXCELLENCE
RE-ACCREDITED BY NAAC WITH 'A++' GRADE (CGPA 3.56)**

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GRIEVANCE MECHANISM ; INTERNAL EVALUATION 2020-2021

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EXAMINATION CALENDAR 2020-2021

EXAMINATION CALENDAR 2020-2021

EXAMINATION CALENDAR FOR THE AY 2019-2020					
<i>Sl. No.</i>	<i>Name of the Course</i>	<i>Class</i>	<i>First/ Second Internal/ Model</i>	<i>Date of Uty. Exam</i>	<i>Date of Announcement of Results</i>
1.	UG (Supply)	4 th Semester Supply Examination (Old Scheme)	-	01/07/2020	12/11/2020
2.	UG (R/S)	4 th Semester Examination	08/06/2020	01/07/2020	09/11/2020
3.	PG	4 th Semester Examination	08/06/2020	01/07/2020	26/10/2020
4.	PG(R/S)	4 th Semester Examination	09/06/2020	02/07/2020	26/10/2020
5.	UG(Supply)	4 th Semester Supply Examination (Old Scheme)	-	03/07/2020	12/11/2020
6.	UG(R/S)	4 th Semester Examination	09/06/2020	03/07/2020	09/11/2020
7.	UG (R/S)	4 th Semester Examination	10/06/2020	06/07/2020	09/11/2020
8.	PG	4 th Semester Examination	10/06/2020	06/07/2020	26/10/2020
9.	PG(R/Imp)	4 th Semester Examination	11/06/2020	07/07/2020	26/10/2020
10.	PG(R/Imp)	4 th Semester Examination	12/06/2020	08/07/2020	26/10/2020
11.	PG(R/Imp)	4 th Semester Examination	15/06/2020	09/07/2020	26/10/2020
12.	PG(R)	4 th Semester Examination	16/06/2020	10/07/2020	26/10/2020
13.	PG (R)	4 th Semester Examination	17/06/2020	15/07/2020	26/10/2020
14.	PG (R)	4 th Semester Examination	18/06/2020	16/07/2020	26/10/2020
15.	PG (R)	4 th Semester Examination	19/06/2020	17/07/2020	26/10/2020
16.	PG (R)	4 th Semester Examination	22/06/2020	23/07/2020	26/10/2020
17.	PG (R)	4 th Semester Examination	24/06/2020	24/07/2020	26/10/2020
18.	PG (R)	4 th Semester Examination	25/06/2020	27/07/2020	26/10/2020
19.	PG (S)	1 st Semester Supply Examination	-	04/11/2020	09/03/2021
20.	UG(B. Voc)	1 st Semester Regular Examination	05/10/2020	04/11/2020	22/03/2021
21.	PG (S)	1 st Semester Supply Examination	-	06/11/2020	09/03/2021
22.	UG(B. Voc)	1 st Semester Regular Examination	06/10/2020	06/11/2020	22/03/2021
23.	PG (S)	1 st Semester Supply Examination	-	09/11/2020	09/03/2021
24.	UG(B. Voc)	1 st Semester Regular Examination	07/10/2020	09/11/2020	22/03/2021
25.	PG (S)	1 st Semester Supply Examination	-	11/11/2020	09/03/2021
26.	UG(B. Voc)	1 st Semester Regular Examination	08/10/2020	11/11/2020	22/03/2021
27.	PG (S)	1 st Semester Supply Examination	-	13/11/2020	09/03/2021
28.	UG(B. Voc)	1 st Semester Regular Examination	09/10/2020	13/11/2020	22/03/2021
29.	UG(R/S/P)	2 nd Semester Examination	26/10/2020	25/11/2020	05/04/2021
30.	UG(R/S/P)	2 nd Semester Examination	27/10/2020	27/11/2020	05/04/2021
31.	UG(R/S/P)	2 nd Semester Examination	28/10/2020	30/11/2020	05/04/2021
32.	PG(R/S)	2 nd Semester Regular Examination	03/11/2020	30/11/2020	29/03/2021
33.	UG(R/S/P)	2 nd Semester Regular Examination	29/10/2020	01/12/2020	05/04/2021
34.	UG (Supply)	6 th Semester Botany Mercy Chance	-	02/12/2020	02/02/2021
35.	UG(R/S/P)	2 nd Semester Examination	30/10/2020	02/12/2020	05/04/2021
36.	PG(R/S)	2 nd Semester Regular Examination	04/11/2020	02/12/2020	29/03/2021
37.	UG(R/S/P)	2 nd Semester Regular Examination	03/11/2020	03/12/2020	05/04/2021
38.	UG(R/S/P)	2 nd Semester Examination	04/11/2020	29/12/2020	05/04/2021
39.	PG(R/S)	2 nd Semester Regular Examination	05/11/2020	29/12/2020	29/03/2021
40.	UG(R/S/p)	2 nd Semester Regular Examination	05/11/2020	30/12/2020	05/04/2021
41.	PG(R/S)	2 nd Semester Regular Examination	06/11/2020	31/12/2020	29/03/2021

42	UG(R/S/p)	2 nd Semester Regular Examination	06/11/2020	01/01/2021	05/04/2021
43	PG(R/S)	2 nd Semester Regular Examination	09/11/2020	01/01/2021	29/03/2021
44	UG(R/S/p)	2 nd Semester Regular Examination	09/11/2020	05/01/2021	05/04/2021
45	UG(R/S/p)	2 nd Semester Regular Examination	10/11/2020	07/01/2021	05/04/2021
46	PG	2 nd Semester Imp & Supply Examination	11/11/2020	14/01/2021	29/03/2021
47	UG (B. Voc)	3 rd Sem B. Voc UG Examination	03/12/2020	20/01/2021	22/04/2021
48	BA/B. Com	3 rd Semester BA /B. Com Pvt Examination	-	20/01/2021	21/04/2021
49	UG (B. Voc)	3 rd Sem B. Voc UG Examination	04/12/2020	22/01/2021	22/04/2021
50	BA (PVT)	3 rd Semester BA Pvt Examination	-	22/01/2021	21/04/2021
51	UG (B. Voc)	3 rd Sem B. Voc UG Examination	07/12/2020	27/01/2021	22/04/2021
52	BA/B. Com	3 rd Semester BA /B. Com Pvt Examination	-	27/01/2021	21/04/2021
53	UG (B. Voc)	3 rd Sem B. Voc UG Examination	08/12/2020	29/01/2021	22/04/2021
54	B. Com (PVT)	3 rd Semester B. Com Pvt Examination	-	29/01/2021	21/04/2021
55	UG(R/Imp)	5 th Semester UG (R/Imp) Examination	11/01/2021	01/02/2021	03/05/2021
56	UG(PVT)	3 rd Semester UG Examination	-	01/01/2021	21/04/2021
57	UG(B. Voc)	3 rd Sem B. Voc UG Examination	09/12/2020	01/01/2021	22/04/2021
58	UG(R/IMP)	5 th Semester UG Examination	12/01/2021	03/02/2021	03/05/2021
59	UG (B. Voc)	3 rd Sem B. Voc UG Examination	10/12/2020	03/02/2021	22/04/2021
60	UG(PVT)	3 rd Semester UG Examination	-	03/02/2021	21/04/2021
61	UG(R/IMP)	5 th Semester UG Examination	13/01/2021	05/02/2021	03/05/2021
62	UG (B. Voc)	3 rd Sem B. Voc UG Examination	11/12/2020	05/02/2021	22/04/2021
63	UG(PVT)	3 rd Semester UG Examination	-	05/02/2021	21/04/2021
64	UG(R/IMP)	3 rd Semester UG Examination	14/12/2020	09/02/2021	21/04/2021
65	UG (S)	2 nd Semester UG Examination	-	10/02/2021	02/04/2021
66	UG(PVT)	4 th Semester UG Examination	-	10/02/2021	07/05/2021
67	UG(R/IMP)	5 th Semester UG Examination (Open Course)	15/12/2020	12/02/2021	03/05/2021
68	UG(PVT)	4 th Semester UG Examination	-	12/02/2021	07/05/2021
69	UG(S&M)	2 nd Semester UG Examination (Supply & Mercy)	-	15/02/2021	22/04/2021
70	UG(PVT)	4 th Semester UG Examination	-	15/02/2021	07/05/2021
71	UG(S&M)	2 nd Semester UG Examination (Supply & Mercy)	-	17/02/2021	22/04/2021
72	UG(PVT)	4 th Semester UG Examination	-	17/02/2021	07/05/2021
73	UG(B. Voc)	2 nd Semester B. Voc Examination	18/01/2021	18/02/2021	06/05/2021
74	UG(S&M)	2 nd Semester UG Examination (Supply & Mercy)	-	19/02/2021	22/04/2021
75	UG(PVT)	4 th Semester UG Examination	-	19/02/2021	07/05/2021
76	UG(S&M)	2 nd Semester UG Examination (Supply & Mercy)	-	22/02/2021	22/04/2021
77	UG(B. Voc)	2 nd Semester B. Voc Examination	19/01/2021	22/02/2021	06/05/2021
78	UG(PVT)	4 th Semester UG Examination	-	22/02/2021	07/05/2021
79	UG(B. Voc)	2 nd Semester B. Voc Examination	20/01/2021	24/02/2021	06/05/2021
80	UG(B. Voc)	2 nd Semester B. Voc Examination	21/01/2021	26/02/2021	06/05/2021
81	UG(S)	2 nd Semester UG Supply Examination	-	26/02/2021	22/04/2021
82	PG(PVT)	3 rd Semester PG Examination	-	26/02/2021	21/05/2021
83	UG(PVT)	1 st Semester UG Examination	-	27/02/2021	07/05/2021
84	UG(B. Voc)	2 nd Semester B. Voc Examination	22/01/2021	01/03/2021	06/05/2021
85	UG(B. Voc)	2 nd Semester B. Voc Examination	25/01/2021	01/03/2021	06/05/2021
86	UG(S)	2 nd Semester UG Supply Examination	-	01/03/2021	22/04/2021
87	PG(PVT)	3 rd Semester PG Examination	-	01/03/2021	21/05/2021
88	UG(PVT)	1 st Semester UG Examination	-	01/03/2021	04/07/2021
89	PG(PVT)	3 rd Semester PG Examination	-	03/03/2021	21/05/2021
90	UG(PVT)	1 st Semester UG Examination	-	03/03/2021	04/07/2021
91	PG(PVT)	3 rd Semester PG Examination	-	05/03/2021	21/05/2021

92	UG(PVT)	1 st Semester UG Examination	-	05/03/2021	04/06/2021
93	UG(PVT)	4 th Semester UG PVT Examination	-	08/03/2021	11/06/2021
94	UG(PVT)	1 st Semester UG Examination	-	08/03/2021	04/06/2021
95	UG(PVT)	1 st Semester UG Examination	-	10/03/2021	04/06/2021
96	UG(PVT)	3 rd Semester UG PVT Examination	-	10/03/2021	10/06/2021
97	UG(PVT)	4 th Semester UG PVT Examination	-	10/03/2021	11/06/2021
98	PG(PVT)	4 th Semester PG PVT Examination	-	12/03/2021	29/06/2021
99	UG(S)	3 rd Semester UG Supply Examination	-	12/03/2021	10/06/2021
100	UG(PVT)	1 st Semester UG PVT Examination	-	12/03/2021	04/06/2021
101	PG	3rd Semester PG Examination	15/02/2021	15/03/2021	16/07/2021
102	PG(PVT)	4 th Semester PG PVT Examination	-	15/03/2021	29/06/2021
103	UG(Imp/S)	3 rd Semester UG Examination	-	15/03/2021	10/06/2021
104	UG(PVT)	1 st Semester UG Examination	-	15/03/2021	04/06/2021
105	UG(B. Voc)	4 th Semester B. Voc Examination	15/02/2021	16/03/2021	07/07/2021
106	UG(Imp/S)	3 rd Semester UG Examination	-	16/03/2021	10/06/2021
107	PG(PVT)	4 th Semester PG PVT Examination	-	17/03/2021	29/06/2021
108	UG(Imp/S)	3 rd Semester UG Examination	-	17/03/2021	10/06/2021
109	UG(PVT)	1 st Semester UG Examination	-	17/03/2021	04/06/2021
110	PG	3rd Semester PG Examination	16/02/2021	18/03/2021	16/07/2021
111	UG(B. Voc)	4 th Semester B. Voc Examination	16/02/2021	18/03/2021	07/07/2021
112	UG(Imp/S)	3 rd Semester UG Examination	-	18/03/2021	10/06/2021
113	PG(PVT)	4 th Semester PG PVT Examination	-	19/03/2021	29/06/2021
114	UG(PVT)	1 st Semester UG Examination	-	19/03/2021	04/06/2021
115	UG(B. Voc)	4 th Semester B. Voc Examination	17/02/2021	20/03/2021	07/07/2021
116	UG(Imp/S)	3 rd Semester UG Examination	-	20/03/2021	10/06/2021
117	PG(PVT)	4 th Semester PG PVT Examination	-	22/03/2021	29/06/2021
118	PG	3rd Semester PG Examination	17/02/2021	22/03/2021	16/07/2021
119	UG(B. Voc)	4 th Semester B. Voc Examination	18/02/2021	22/03/2021	07/07/2021
120	UG(Imp/S)	3 rd Semester UG Examination	-	22/03/2021	10/06/2021
121	UG(PVT)	1 st Semester UG Examination	-	22/03/2021	05/08/2021
122	PG(PVT)	4 th Semester PG PVT Examination	-	23/03/2021	29/06/2021
123	UG(S/imp)	5 th Semester UG Examination	-	23/03/2021	18/06/2021
124	UG(B. Voc)	4 th Semester B. Voc Examination	19/02/2021	24/03/2021	07/07/2021
125	PG(PVT)	4 th Semester PG PVT Examination	-	24/03/2021	29/06/2021
126	UG(PVT)	2 nd Semester UG PVT Examination	-	24/03/2021	06/08/2021
127	PG(R/imp)	3 rd Semester PG Examination	19/02/2021	25/03/2021	16/07/2021
128	PG(PVT)	4 th Semester PG PVT Examination	-	25/03/2021	29/06/2021
129	UG (B. Voc)	1 st Semester UG B. Voc Examination	01/03/2021	27/03/2021	05/08/2021
130	PG(R/imp)	3 rd Semester PG Examination	22/02/2021	29/03/2021	16/07/2021
131	UG(S)	5 th Semester UG Supply Examination	-	29/03/2021	18/06/2021
132	UG (B. Voc)	1 st Semester UG B. Voc Examination	02/03/2021	29/03/2021	05/08/2021
133	PG(PVT)	4 th Semester PG PVT Examination	-	30/03/2021	29/06/2021
134	UG(S/imp)	4 th Semester UG Supply /Imp Examination	-	30/03/2021	02/07/2021
135	PG(PVT)	3 rd Semester PG PVT Examination	-	31/03/2021	16/07/2021
136	UG(S/imp)	5 th Semester UG Supply Examination	-	31/03/2021	18/06/2021
137	UG (B. Voc)	1 st Semester UG B. Voc Examination	03/03/2021	31/03/2021	05/08/2021
138	UG (PVT)	1 st Semester PVT Examination	-	31/03/2021	05/08/2021
139	UG (B. Voc)	1 st Semester UG B. Voc Examination	04/03/2021	08/04/2021	05/08/2021
140	UG(S/imp)	4 th Semester UG Supply /Imp Examination	-	09/04/2021	02/07/2021
414	UG (B. Voc)	1 st Semester UG B. Voc Examination	05/03/2021	12/04/2021	05/08/2021
142	UG(S/imp)	4 th Semester UG Supply /Imp Examination	-	13/04/2021	02/07/2021
143	UG(S/imp)	4 th Semester UG Supply /Imp Examination	-	15/03/2021	02/07/2021
144	UG (B. Voc)	4 th Semester UG B. Voc Examination	15/03/2021	16/04/2021	07/07/2021

145	PG(PVT)	4 th Semester PG PVT Examination	-	16/04/2021	29/06/2021
146	UG(S/imp)	4 th Semester UG Supply /Imp Examination	-	16/04/2021	02/07/2021
147	UG(PVT)	2 ND Semester UG PVT Examination	-	16/04/2021	06/08/2021
148	UG(S/imp)	4 th Semester UG Supply /Imp Examination	-	17/04/2021	02/07/2021
149	UG(R/S/PVT)	6 th Semester UG Examination (R/IMP/PVT)	22/03/2021	28/06/2021	03/09/2021
150	UG (B. Com)	6 th Semester UG B. Com Examination	15/03/2021	29/06/2021	03/09/2021
151	UG(R/S/PVT)	6 th Semester UG Examination (R/IMP/PVT)	16/03/2021	30/06/2021	03/09/2021



MODEL ANSWER SCRIPT

2020-2021

Name of the Student: Liya Babu

Class Number: 67

Name of the Programme: M.Sc. Physics

Name of the Course: Mathematical Physics - I

Date: 18. 01. 2021



ST. THOMAS COLLEGE, PALA

PG INTERNAL / MODEL EXAMINATION

Name of the student : Liya Babu Class Number : 67

Name of the Programme : M.Sc. Physics Semester : I

Name of the Course : Mathematical Physics - I Date : 18.01.2021

GRADE (To be filled by the Examiner)

A

Question Numbers	Grade Awarded	Grade Points	Weight	Weighted Grade Points
1	A+	5	1	5
2	A+	5	1	5
3	A+	5	1	5
4	A	4	1	4
5	A+	5	1	5
6	A	4	1	4
7	A	4	1	4
8	A	4	1	4
9	A	4	2	8
10	A+	5	2	10
11	A+	5	2	10
12	A+	5	2	10
13	A	4	2	8
14	C	2	2	4
15	A+	5	5	25
16	A	4	5	20
17				
18				
19				
20				
21				
22				
23				
24				
				131
<u>Sum of the weighted grade points</u> Total Weight				<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> $\frac{131}{150}$ </div> 4.36

Signature of the Examiner : D. Job Mathen D.K. Job Mathen

Signature of the Student : Liya Babu

Signature of the Parent : [Signature]

Part-A

1. We consider a function called inner product by which we can ~~find~~ ^{make} the numbers from vectors. A vector space equipped with inner product is called an inner product space. The inner product of two vectors is defined as,

$$\vec{a} \cdot \vec{b} = a_1 b_1 + a_2 b_2 + a_3 b_3, \quad \text{where } \vec{a} = a_1 \hat{i} + a_2 \hat{j} + a_3 \hat{k}$$
$$\vec{b} = b_1 \hat{i} + b_2 \hat{j} + b_3 \hat{k}$$

Properties of inner product space

- i) $\vec{a} \cdot \vec{a} \geq 0$, for all 'a' ✓
- ii) $\vec{a} \cdot \vec{a} = 0$, if $\vec{a} = 0$. ✓
- iii) $\vec{a} \cdot (x+y) = \vec{a} \cdot x + \vec{a} \cdot y$ ✓
- iv) $\vec{a} \cdot (\alpha b) = \alpha(\vec{a} \cdot \vec{b})$
- v) $\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$

The norm of a vector is defined as,

$$|\vec{a}| = \sqrt{a_1^2 + a_2^2 + \dots + a_n^2}$$

$$|\vec{a}|^2 = a_1^2 + a_2^2 + \dots + a_n^2$$
$$= \underline{\underline{\vec{a} \cdot \vec{a}}}$$

2. Stoke's theorem relates line and surface integrals. It states that,

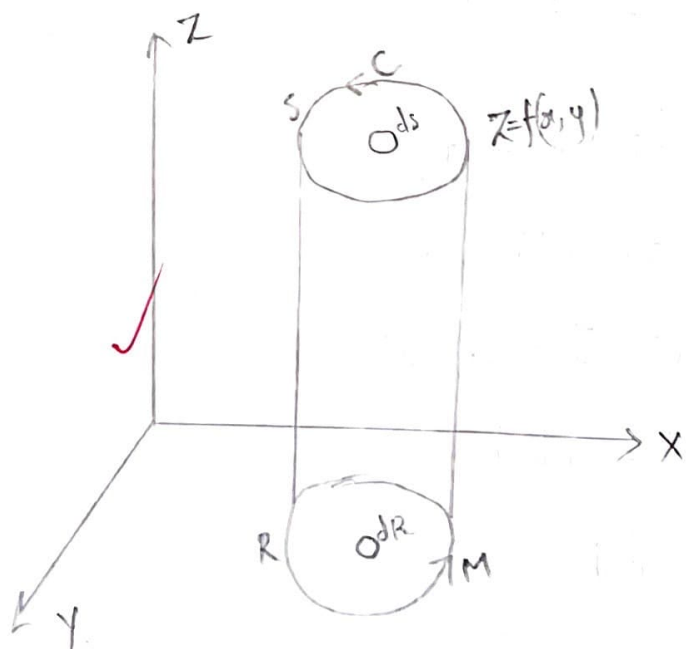
For a vector function, the tangential line integral of a function around a closed curve 'c' enclosing a surface 's' is equal to the normal surface integral of curl of that function over that enclosed surface.

i.e.

$$\iint_S (\nabla \times F) \cdot \hat{n} \, ds = \oint_C F \cdot dx$$

Proof

Let 'S' be a surface bounded by curve 'c'. The projection of 'S' on xy plane be R, bounded by the curve M. Let Z be defined as $Z=f(x,y)$



Let $F = F_1 \hat{i} + F_2 \hat{j} + F_3 \hat{k}$

$$(\nabla \times F) \cdot \hat{n} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ F_1 & 0 & 0 \end{vmatrix} = \hat{j} \left(-\frac{\partial F_1}{\partial z} \right) + \hat{k} \left(\frac{\partial F_1}{\partial y} \right)$$

$$= \frac{\partial F_1}{\partial z} \hat{j} - \frac{\partial F_1}{\partial y} \hat{k}$$

$$(\nabla \times F_1) \cdot \hat{n} \, ds = \left(\frac{\partial F_1}{\partial z} \hat{j} \cdot \hat{n} - \frac{\partial F_1}{\partial y} \hat{k} \cdot \hat{n} \right) ds \quad (1)$$

Let \vec{r} be a point on the surface S'

$$\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$$

$$\frac{\partial \vec{r}}{\partial y} = \frac{\partial x}{\partial y} \hat{i} + \frac{\partial y}{\partial y} \hat{j} + \frac{\partial z}{\partial y} \hat{k}$$

$$\frac{\partial \vec{r}}{\partial y} = z \hat{j} + \frac{\partial z}{\partial y} \hat{k}$$

$$\hat{n} \cdot \frac{\partial \vec{r}}{\partial y} = \hat{n} \cdot \hat{j} + \frac{\partial z}{\partial y} \hat{n} \cdot \hat{k} \quad \checkmark$$

$\left. \begin{array}{l} z \text{ is a function of } x, y \\ \text{but } x \text{ is not function} \\ \text{of } y \end{array} \right\}$

\vec{r} is a point xy plane but \hat{n} is a unit vector projected to plane z .
 \therefore angle between them is 90° .

$$\hat{n} \cdot \hat{j} = -\frac{\partial z}{\partial y} \hat{n} \cdot \hat{k} \quad (2)$$

Sub (2) in (1)

$$\begin{aligned} (\nabla \times F_1) \cdot \hat{n} \, ds &= \left(\frac{\partial F_1}{\partial z} \left(-\frac{\partial z}{\partial y} \hat{n} \cdot \hat{k} \right) - \frac{\partial F_1}{\partial y} \hat{n} \cdot \hat{k} \right) ds \\ &= - \left(\frac{\partial F_1}{\partial y} + \frac{\partial F_1}{\partial z} \frac{\partial z}{\partial y} \right) \hat{n} \cdot \hat{k} \, ds. \quad (3) \end{aligned}$$

F_1 is a function of x, y, z , but z is a function of x, y . Therefore,

$$F_1(x, y, z) = \phi(x, y)$$

$$\frac{\partial \phi}{\partial y} = \frac{\partial F_1}{\partial y} + \frac{\partial F_1}{\partial z} \frac{\partial z}{\partial y}$$

Comparing with (3)

$$\begin{aligned} (\nabla \times F_1) \cdot \hat{n} \, ds &= -\frac{\partial \phi}{\partial y} \hat{n} \cdot \hat{k} \, ds = -\frac{\partial \phi}{\partial y} \, dx \, dy \\ &\quad \left(\hat{n} \cdot \hat{k} \, ds = dx \, dy \right) \end{aligned}$$

$$\iint_S (\nabla \times F) \cdot \hat{n} \, ds = \iint_S -\frac{\partial \phi}{\partial y} \, dx \, dy \quad \text{--- (4)}$$

From Green's theorem,

$$\oint M \, dx + N \, dy = \iint_S \left(\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y} \right) \, dx \, dy$$

put $M = \phi$ and $N = 0$.

$$\oint \phi \, dx = \iint_S -\frac{\partial \phi}{\partial y} \, dx \, dy$$

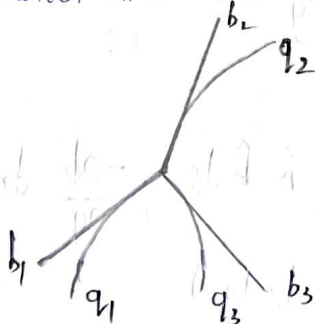
So, from (4),

$$\iint_S (\nabla \times F) \cdot \hat{n} \, ds = \oint \phi \, dx = \oint F_1 \, dx.$$

\therefore This can be, in general written as,

$$\iint_S (\nabla \times F) \cdot \hat{n} \, ds = \oint F \, ds$$

3. The physical laws can be best expressed in terms of vectors, But vectors need to be in appropriate coordinates. A point $P(x, y, z)$ in cartesian system is represented by three mutually perpendicular axes. Likewise, in curvilinear coordinate system, a point is represented by three orthogonal coordinate surfaces (q_1, q_2, q_3) . The intersection of three mutually perpendicular curves is called coordinate lines, and the tangent to which at the intersection of three curves is called coordinate axes.



Let \vec{r} be a vector defined by,

$$\vec{r} = \vec{r}(q_1, q_2, q_3)$$

$$d\vec{r} = \frac{\partial \vec{r}}{\partial q_1} dq_1 + \frac{\partial \vec{r}}{\partial q_2} dq_2 + \frac{\partial \vec{r}}{\partial q_3} dq_3$$

$$d\vec{r} = b_1 dq_1 + b_2 dq_2 + b_3 dq_3 \quad \text{--- (1)}$$

b_i is the base vector which ^{points in the direction of} depends on the change of r_i which depends on coordinates q_1, q_2, q_3 .

A unit vector can be defined as,

$$\hat{q}_i = \frac{\frac{\partial r_i}{\partial q_i}}{\left| \frac{\partial r_i}{\partial q_i} \right|} = \frac{b_i}{|b_i|} = \frac{b_i}{h_i}$$

$$\therefore (1) \Rightarrow d\vec{r} = h_1 dq_1 \hat{q}_1 + h_2 dq_2 \hat{q}_2 + h_3 dq_3 \hat{q}_3$$

The gradient of a scalar in orthogonal curvilinear coordinates can then be defined in terms of q_1, q_2, q_3 as,

In cartesian system,

$$\nabla \phi = \frac{\partial \phi}{\partial x} \hat{i} + \frac{\partial \phi}{\partial y} \hat{j} + \frac{\partial \phi}{\partial z} \hat{k}$$

At

Similarly in curvilinear coordinates,

$$\nabla \phi = \frac{\partial \phi}{h_1 \partial q_1} \hat{q}_1 + \frac{\partial \phi}{h_2 \partial q_2} \hat{q}_2 + \frac{\partial \phi}{h_3 \partial q_3} \hat{q}_3$$

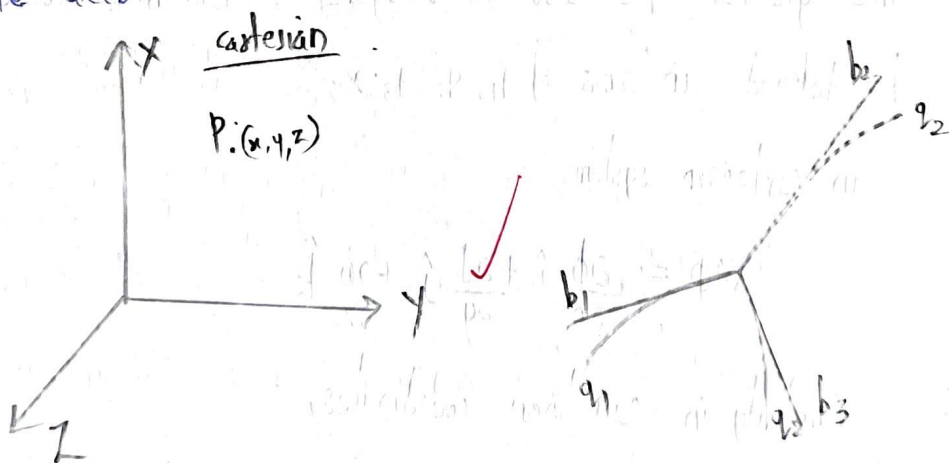
where the operator is given by,

$$\nabla = \frac{\partial}{h_1 \partial q_1} \hat{q}_1 + \frac{\partial}{h_2 \partial q_2} \hat{q}_2 + \frac{\partial}{h_3 \partial q_3} \hat{q}_3$$

4.

The physical laws can be best expressed in terms of vectors. The vectors need to be represented in terms of appropriate coordinates before solving the physical problem. For example, the motion of a particle in central force field has spherical symmetry. Hence, the use of spherical polar coordinates are best suited and the use of cylindrical coordinates is best of a charged particle moving in a helical path.

In cartesian coordinate system, a point is defined by three mutually perpendicular axes (x, y, z) . In curvilinear coordinates, a point (q_1, q_2, q_3) are characterised by three orthogonal coordinate surfaces. The intersection of three mutually perpendicular curves is called coordinate lines and the tangents to which at the intersection gives coordinate axes.



Element of displacement

Let \vec{r} be a point defined as,

$$\vec{r} = \vec{r}(q_1, q_2, q_3)$$

$$d\vec{r} = \frac{\partial \vec{r}}{\partial q_1} dq_1 + \frac{\partial \vec{r}}{\partial q_2} dq_2 + \frac{\partial \vec{r}}{\partial q_3} dq_3 = b_1 dq_1 + b_2 dq_2 + b_3 dq_3$$

' b_i ' is a base vector which directs along the change of x_i .

A unit vector can be defined as

$$\hat{q}_i = \frac{\partial r / \partial q_i}{\left| \frac{\partial r}{\partial q_i} \right|} = \frac{b_i}{|b_i|} = \frac{b_i}{h_i}$$

$$\therefore dr = h_1 dq_1 \hat{q}_1 + h_2 dq_2 \hat{q}_2 + h_3 dq_3 \hat{q}_3$$

A

Curvilinear coordinates is a family of surfaces which intersects others at right angles.

5. Gauss divergence theorem

The divergence of a vector function \vec{F} over a volume V is equal to the surface integral of \vec{F} around any closed ~~curve~~ surface S surrounding a volume V .

$$\iiint_V (\nabla \cdot \vec{F}) dV = \iint_S \vec{F} \cdot d\vec{s}$$

Proof.

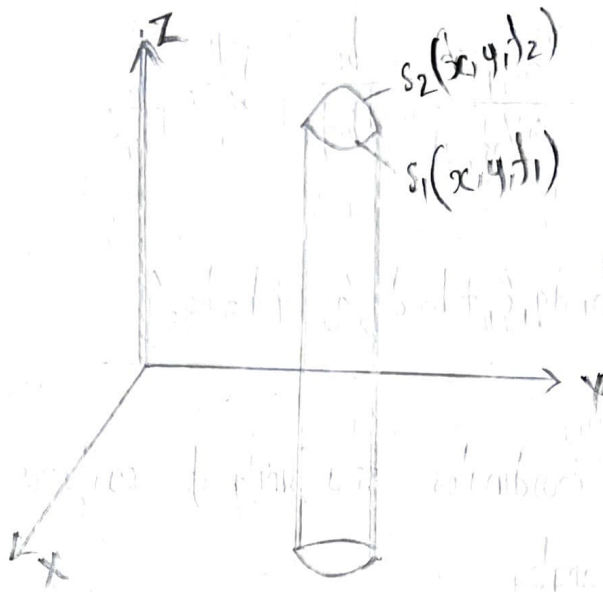
$$\text{Let } \vec{F} = F_1 \hat{i} + F_2 \hat{j} + F_3 \hat{k}$$

$$\nabla \cdot \vec{F} = \frac{\partial F_1}{\partial x} + \frac{\partial F_2}{\partial y} + \frac{\partial F_3}{\partial z}$$

$$\iiint_V \nabla \cdot \vec{F} dV = \iiint_V \left(\frac{\partial F_1}{\partial x} + \frac{\partial F_2}{\partial y} + \frac{\partial F_3}{\partial z} \right) dx dy dz$$

$$= \iiint_V \frac{\partial F_1}{\partial x} dx dy dz + \iiint_V \frac{\partial F_2}{\partial y} dx dy dz + \iiint_V \frac{\partial F_3}{\partial z} dx dy dz$$

consider a strip parallel to z axis which touch the upper surface ^{of volume} at s_2 and lower surface at s_1 ,



consider,

$$\iiint_V \frac{\partial F_3}{\partial z} dx dy dz = \iint \int_{z_1}^{z_2} \frac{\partial F_3}{\partial z} dz dx dy$$

$$= \iint (F_3(x, y, z_2) - F_3(x, y, z_1)) dx dy$$

At Taking the outward normal flux over a surface as +ve and inward normal flux as -ve,

$$\hat{n} \cdot \hat{k} ds = dx dy \quad (\text{upper surface})$$

$$\hat{n} \cdot \hat{k} ds = -dx dy \quad (\text{Lower "})$$

$$\therefore \int_S (F_3(x, y, z_2) + F_3(x, y, z_1)) dx dy = \int_S F_3 \cdot ds = \iiint_V \frac{\partial F_3}{\partial z} dx dy dz$$

similarly,

$$\iiint_V \frac{\partial F_2}{\partial y} dx dy dz = \int_S F_2 \cdot ds$$

$$\iiint_V \frac{\partial F_1}{\partial x} dx dy dz = \int_S F_1 \cdot ds$$

In general,

$$\iiint_V (\nabla \cdot F) dv = \iint_S F \cdot ds$$

6.

Levi-Civita tensor is a tensor quantity of rank three in a three dimensional space and it is a tensor quantity of rank 4 in a four dimensional space. It is also called Epsilon tensor, Alternate tensor and permutation tensor. In 3 dimensional space, it is represented as ϵ_{ijk} and four dimensional space ϵ_{ijkl} . It is an invariant tensor, independent of coordinate systems.

The properties of epsilon tensor is,

$$\epsilon_{ijk} = \begin{cases} 1, & \text{even permutation} \\ -1, & \text{odd permutation} \\ 0, & \text{if an index repeats} \end{cases} = \epsilon_{jick}$$

The permutations are,

$$\epsilon_{123} = \epsilon_{231} = \epsilon_{312} = 1$$

$$\epsilon_{213} = \epsilon_{132} = \epsilon_{321} = -1$$

$$\epsilon_{111} = \epsilon_{211} = \epsilon_{311} = 0$$

7. A matrix 'A' is said to be orthogonal when

$$A A^T = A^T A = I.$$

Let 'A' be an orthogonal matrix, A^T be the transpose of A.

checking the orthogonality condition,

$$A^T (A^T)^T = A^T A = I.$$

ie. A^T is also orthogonal.

eg. Let $A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

$$A^T = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$A A^T = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

ie. A is orthogonal.

$$A^T = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$A^T (A^T)^T = A^T A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \underline{\underline{\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}}}$$

8. Central limit theorem has an important role in mathematics.

We have the normal distribution function whose probability function

is of the form,

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{1}{2} \left(\frac{x-\mu}{\sigma}\right)^2\right)$$

Central limit theorem states that the average of independent and identically distributed random variables with finite variance converges to a normal distribution irrespective of the distribution of original random variables. Let X_1, X_2, \dots be random variables with mean μ and variance $\sigma^2 > 0$. Then the sequence of random variables,

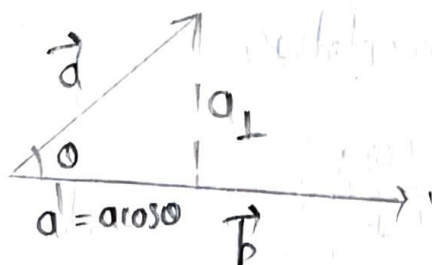
A

$$Z_n = \frac{\sum_{i=1}^n X_i - n\mu}{\sigma\sqrt{n}}$$

converges in distribution to a standard normal random variable.

Part-B

9. Consider two vectors \vec{a}, \vec{b} at an angle θ . Let a_{\perp} be the projection of \vec{a} on \vec{b} .



$$a_{\perp} = \vec{a} - a' \quad (\text{Law of triangle addition})$$

$$= \vec{a} - \frac{(\vec{a} \cdot \vec{b})}{\vec{b} \cdot \vec{b}} \vec{b}$$

Using the first property of inner product space,

$$\vec{a} \cdot \vec{a} \geq 0$$

$$a_{\perp} \cdot a_{\perp} \geq 0.$$

$$\left(\vec{a} - \frac{(\vec{a} \cdot \vec{b}) \vec{b}}{\vec{b} \cdot \vec{b}} \right) \cdot \left(\vec{a} - \frac{(\vec{a} \cdot \vec{b}) \vec{b}}{\vec{b} \cdot \vec{b}} \right) \geq 0.$$

$$\vec{a} \cdot \vec{a} - \frac{\vec{a}(\vec{a} \cdot \vec{b}) \vec{b}}{\vec{b} \cdot \vec{b}} - \frac{(\vec{a} \cdot \vec{b}) \vec{b} \cdot \vec{a}}{\vec{b} \cdot \vec{b}} + \left(\frac{(\vec{a} \cdot \vec{b}) \vec{b} \cdot \vec{b}}{\vec{b} \cdot \vec{b}} \right)^2 \geq 0.$$

$$\vec{a} \cdot \vec{a} - \frac{2(\vec{a} \cdot \vec{b})^2}{\vec{b} \cdot \vec{b}} + \frac{(\vec{a} \cdot \vec{b})^2}{\vec{b} \cdot \vec{b}} \geq 0.$$

$$(\vec{a} \cdot \vec{a})(\vec{b} \cdot \vec{b}) - (\vec{a} \cdot \vec{b})^2 \geq 0.$$

$$(\vec{a} \cdot \vec{a})(\vec{b} \cdot \vec{b}) \geq (\vec{a} \cdot \vec{b})^2$$

$$|\vec{a}| |\vec{b}| \geq |\vec{a} \cdot \vec{b}|$$

10. A vector is a physical quantity having both magnitude and direction. A vector of magnitude 1 is called a unit vector. A vector can be represented as,

$$\vec{A} = \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}.$$

Let $\hat{e}_1, \hat{e}_2, \hat{e}_3$ be unit vectors used to represent a vector.

$$\hat{e}_1 = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}, \quad \hat{e}_2 = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}, \quad \hat{e}_3 = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$$

The dot product of two vectors can be written as,

$$\vec{a} \cdot \vec{b} = a_1 b_1 + a_2 b_2 + a_3 b_3$$

$$= \sum_{i=1}^3 a_i b_i$$

$$\text{Norm of } \vec{a} = (\vec{a} \cdot \vec{a})^{1/2}$$

Properties of linear vector space

A linear vector space consists of

- i) \mathbb{F} - a field of a scalar ✓
- ii) V - a set of elements called vectors ✓
- iii) A rule - vector addition ✓

a) $x+y = y+x$ ✓

b) $(x+y)+z = x+(y+z)$ ✓

c) $x+0 = x$ ✓

d) If there exist a vector x in a vector space, then there will be $-x$ such that $x+(-x)=0$.

iv) A rule called vector multiplication,

a) $\vec{a} \cdot 1 = \vec{a}$

b) $\vec{a}(\alpha+\beta) = \alpha\vec{a} + \beta\vec{a}$ $\vec{a}(\alpha\beta) = \alpha(\beta\vec{a})$

c) $\vec{a}(\alpha\beta) = \vec{a}(\alpha\beta) = \alpha(\beta\vec{a})$

d) $\alpha(\vec{a}+\vec{b}) = \alpha\vec{a} + \alpha\vec{b}$ ✓

(This is called a linear vector space.)

11. The process of generating a set of orthonormal vectors from linearly independent vectors is called Gram-Schmidt orthonormalization.

Let $|x_1\rangle, |x_2\rangle, \dots, |x_n\rangle$ be 'n' linearly independent variables and $|y_1\rangle, |y_2\rangle, \dots, |y_n\rangle$ be a set of orthonormal vectors

$$\text{Let } |y_1\rangle = \frac{|x_1\rangle}{\|x_1\|} \quad \text{--- (1)}$$

$$|y_2'\rangle = |x_2\rangle + \alpha |y_1\rangle \quad \text{--- (2)}$$

operating (2) with $\langle y_1|$

$$\langle y_1 | y_2' \rangle = \langle y_1 | x_2 \rangle + \alpha \langle y_1 | y_1 \rangle$$

$$0 = \langle y_1 | x_2 \rangle + \alpha \cdot 1$$

$$\therefore \alpha = -\langle y_1 | x_2 \rangle$$

Substituting α in (2),

$$|y_2'\rangle = |x_2\rangle - \langle y_1 | x_2 \rangle |y_1\rangle \quad \text{--- (3)}$$

$$|y_2\rangle = \frac{|y_2'\rangle}{\|y_2'\|} = \frac{1}{\|y_2'\|} \left\{ |x_2\rangle - \langle y_1 | x_2 \rangle |y_1\rangle \right\}$$

$$\text{Let } |y_3'\rangle = |x_3\rangle + \beta |y_2\rangle + \gamma |y_1\rangle \quad \text{--- (4)}$$

operating (4) with $\langle y_2|$

$$\langle y_2 | y_3' \rangle = \langle y_2 | x_3 \rangle + \beta \langle y_2 | y_2 \rangle + \Gamma \langle y_2 | y_1 \rangle$$

$$0 = \langle y_2 | x_3 \rangle + \beta$$

$$\beta = -\langle y_2 | x_3 \rangle \quad \text{--- (5)}$$

operating (4) with $\langle y_1 |$

$$\langle y_1 | y_3' \rangle = \langle y_1 | x_3 \rangle + \beta \langle y_1 | y_2 \rangle + \Gamma \langle y_1 | y_1 \rangle$$

$$0 = \langle y_1 | x_3 \rangle + \Gamma - 1$$

$$\Gamma = -\langle y_1 | x_3 \rangle \quad \text{--- (6)}$$

Sub β, Γ in (4),

$$|y_3'\rangle = |x_3\rangle - \langle y_2 | x_3 \rangle |y_2\rangle - \langle y_1 | x_3 \rangle |y_1\rangle$$

$$y_3 = \frac{|y_3'\rangle}{\|y_3'\|} = \frac{1}{\|y_3'\|} \left\{ |x_3\rangle - \langle y_2 | x_3 \rangle |y_2\rangle - \langle y_1 | x_3 \rangle |y_1\rangle \right\}$$

At

In general,

$$y_n = \frac{1}{\|y_n'\|} \left\{ |x_n\rangle - \langle y_{n-1} | x_n \rangle |y_{n-1}\rangle - \langle y_{n-2} | x_n \rangle |y_{n-2}\rangle \dots - \langle y_1 | x_n \rangle |y_1\rangle \right\}$$

Example

Let ~~$|x_1\rangle = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$~~ ~~$|x_2\rangle = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$~~

~~$\langle x_1 | x_1 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix} = 1$~~

~~$\langle x_1 | x_2 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 0 \\ 1 \end{pmatrix} = 0$~~

$$\text{Let } |x_1\rangle = \begin{pmatrix} 1 \\ 0 \end{pmatrix} \quad |x_2\rangle = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$\langle x_1 | x_1 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix} = 1$$

$$\langle x_1 | x_2 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 1 \\ 1 \end{pmatrix} = 1$$

$\therefore |x_1\rangle, |x_2\rangle$ are not orthonormal vectors,

$$\text{Let } |y_1\rangle = \frac{|x_1\rangle}{\|x_1\|} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$|y_2\rangle = \frac{1}{\|y_2\|} \left\{ |x_2\rangle - \langle y_1 | x_2 \rangle |y_1\rangle \right\}$$

$$\langle y_1 | x_2 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 1 \\ 1 \end{pmatrix} = 1$$

$$\therefore |y_2\rangle = \begin{pmatrix} 1 \\ 1 \end{pmatrix} - \begin{pmatrix} 1 \\ 0 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$\langle y_1 | y_1 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix} = 1$$

$$\langle y_1 | y_2 \rangle = \begin{pmatrix} 1 & 0 \end{pmatrix} \begin{pmatrix} 0 \\ 1 \end{pmatrix} = 0$$

\therefore These are orthonormal vectors.

12. The metric tensor in spherical polar coordinates is,

$$ds^2 = dr^2 + r^2 d\theta^2 + r^2 \sin^2 \theta d\phi^2$$

The metric tensor is given by,

$$ds^2 = g_{\alpha\beta} dx^\alpha dx^\beta$$

Comparing with standard equation, the components of fundamental covariant metric is given by,

$$g_{11} = 1, \quad g_{22} = r^2, \quad g_{33} = r^2 \sin^2 \theta$$

$$g_{\alpha\beta} = 0, \quad \alpha \neq \beta$$

\(\therefore\) The covariant fundamental metric tensor is given by,

$$g_{\alpha\beta} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & r^2 & 0 \\ 0 & 0 & r^2 \sin^2 \theta \end{pmatrix}$$

Contravariant fundamental metric tensor is,

$$g^{\alpha\beta} = \frac{\text{Cofactor } g_{\alpha\beta}}{|g_{\alpha\beta}|} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1/r^2 & 0 \\ 0 & 0 & 1/r^2 \sin^2 \theta \end{pmatrix}$$

Christoffel symbols of first kind

$$\Gamma_{\mu\nu\sigma} = \frac{1}{2} \left(\frac{\partial g_{\mu\sigma}}{\partial x^\nu} + \frac{\partial g_{\nu\sigma}}{\partial x^\mu} - \frac{\partial g_{\mu\nu}}{\partial x^\sigma} \right)$$

$$\Gamma_{11,1} = \frac{1}{2} \left(\frac{\partial g_{11}}{\partial x^1} + \frac{\partial g_{11}}{\partial x^1} - \frac{\partial g_{11}}{\partial x^1} \right)$$

$$g_{11} = 1$$

$$x^1 = \delta, \quad x^2 = \delta, \quad x^3 = \phi$$

$$\therefore \frac{\partial g_{11}}{\partial \delta} = \frac{\partial(1)}{\partial \delta} = 0$$

$$\therefore \Gamma_{11,1} = 0$$

$$\Gamma_{22,2} = \frac{1}{2} \left(\frac{\partial g_{22}}{\partial x^2} + \frac{\partial g_{22}}{\partial x^2} - \frac{\partial g_{22}}{\partial \phi} \right)$$

$$g_{22} = \delta^2$$

$$\therefore \Gamma_{22,2} = 0$$

Similarly, $\Gamma_{33,3} = 0$

$$\Gamma_{22,1} = \frac{1}{2} \left(\frac{\partial g_{21}}{\partial x^2} + \frac{\partial g_{21}}{\partial x^2} - \frac{\partial g_{22}}{\partial x^1} \right)$$

$$= \frac{1}{2} \left(0 + 0 - \frac{\partial(\delta^2)}{\partial \delta} \right) = \underline{\underline{-\delta}}$$

$$\Gamma_{33,1} = \frac{1}{2} \left(\frac{\partial g_{31}}{\partial x^3} + \frac{\partial g_{31}}{\partial x^3} - \frac{\partial g_{33}}{\partial x^1} \right)$$

$$= \frac{1}{2} \left(0 + 0 - \frac{\partial(\delta^2 \sin^2 \phi)}{\partial \delta} \right) = \underline{\underline{\delta \sin^2 \phi}}$$

$$\Gamma_{12,3} = \frac{1}{2} \left(\frac{\partial g_{13}}{\partial x^2} + \frac{\partial g_{23}}{\partial x^1} - \frac{\partial g_{12}}{\partial x^3} \right) = 0$$

$$\therefore \Gamma_{1,23} = \Gamma_{2,13} = \Gamma_{3,12} = \Gamma_{23,1} = 0$$

$$\Gamma_{12,1} = \frac{1}{2} \left(\frac{\partial g_{11}}{\partial x^2} + \frac{\partial g_{21}}{\partial x^1} - \frac{\partial g_{12}}{\partial x^1} \right)$$

$$= \frac{1}{2} \left(\frac{\partial(1)}{\partial \delta} + 0 - 0 \right) = 0$$

∴ The non vanishing terms are $\Gamma_{22,1}$ and $\Gamma_{33,1}$.
Christoffel's symbols of 2nd kind.

$$\Gamma_{\mu\nu}^{\sigma} = g^{\sigma\lambda} \Gamma_{\mu\nu,\lambda}$$

$$\Gamma_{11}^1 = g^{11} \Gamma_{11,1} + g^{12} \Gamma_{11,2} + g^{13} \Gamma_{11,3} = 0.$$

similarly,

$$\Gamma_{12}^1 = g^{11} \Gamma_{12,1} + g^{12} \Gamma_{12,2} + g^{13} \Gamma_{12,3}.$$

$$= 0 //$$

A 9

$$\left. \begin{array}{l} \Gamma_{11,1} = \Gamma_{11,2} = \Gamma_{11,3} = 0 \\ \Gamma_{12,1} = \Gamma_{12,2} = \Gamma_{12,3} = 0 \end{array} \right\}$$

Hence all components of Christoffel's symbols of 2nd kind are zero.

13. Let $\lambda_1, \lambda_2, \dots, \lambda_n$ be eigenvalues of a matrix A and x_1, x_2, \dots, x_n be eigen vectors,

$$X_i = \begin{bmatrix} x_{1i} \\ x_{2i} \\ \vdots \\ x_{ni} \end{bmatrix} = X_{ij}$$

Let P be a matrix formed by eigen vectors,

$$P = \begin{pmatrix} X_{11} & X_{12} & \dots & X_{1n} \\ X_{21} & X_{22} & \dots & X_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ X_{n1} & X_{n2} & \dots & X_{nn} \end{pmatrix}$$

'D' be a diagonal matrix formed of eigen values,

$$D = \begin{pmatrix} \lambda_1 & 0 & 0 & \dots \\ 0 & \lambda_2 & \dots & \dots \\ 0 & 0 & \lambda_3 & \dots \\ \vdots & \vdots & \vdots & \ddots \end{pmatrix}$$

$$PD = \begin{pmatrix} \lambda_1 x_{11} & 0 & \dots & \dots \\ 0 & \lambda_2 x_{22} & \dots & \dots \\ 0 & 0 & \dots & \dots \\ \vdots & \vdots & \vdots & \ddots \end{pmatrix}$$

$$= A [x_1, x_2, \dots, x_n]$$

$$= AP$$

premultiplying with P^{-1}

$$P^{-1}PD = P^{-1}AP$$

$$D = \underline{P^{-1}AP}$$

Thus P can be found such that $P^{-1}AP$ is a diagonal matrix. This is called diagonalization of a matrix.

14.

$$A = \begin{pmatrix} 3 & 2 & 1 \\ 2 & 3 & 1 \\ 1 & 1 & 4 \end{pmatrix}$$

Ans. pt. no. has provided

We have to find a matrix M s.t. $AM = I$

$$\begin{pmatrix} 3 & 2 & 1 \\ 2 & 3 & 1 \\ 1 & 1 & 4 \end{pmatrix} \quad \text{and} \quad \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

Dividing R_1 by 3, R_2 by 2 and R_3 by 1

$$\begin{pmatrix} 1 & 0.6666 & 0.3333 \\ 1 & 1.5 & 0.5 \\ 1 & 1 & 4 \end{pmatrix} \quad \text{and} \quad \begin{pmatrix} 0.3333 & 0 & 0 \\ 0 & 0.5 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

Subtracting first and third row from 2nd.

~~$$\begin{pmatrix} 0 & 0.8334 & 0.1667 \\ 1 & 1.5 & 0.5 \\ 0 & 0.5 & -3.5 \end{pmatrix} \quad \text{and} \quad \begin{pmatrix} -0.3333 & 0.5 & 0 \\ 0 & 0.5 & 0 \\ 0 & 0.5 & -1 \end{pmatrix}$$~~

÷ Second row by 1.5

~~$$\begin{pmatrix} 0 & 0.8334 & 0.1667 \\ 0 & 1 & 0.3333 \\ 0 & 0.5 & -3.5 \end{pmatrix} \quad \text{and} \quad \begin{pmatrix} -0.3333 & 0.5 & 0 \\ 0 & 0.333 & 0 \\ 0 & 0.5 & -1 \end{pmatrix}$$~~

Sub R_1 changes to $R_1 - 0.8334R_2$ and $R_3 \rightarrow R_3 - 0.5R_2$.

$$\begin{pmatrix} 1 & 0.6666 & 0.3333 \\ 0 & 0.834 & 0.17 \\ 0 & 0.334 & 3.6 \end{pmatrix} \quad \begin{pmatrix} 0.333 & 0 & 1 \\ 0 & 0.5 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

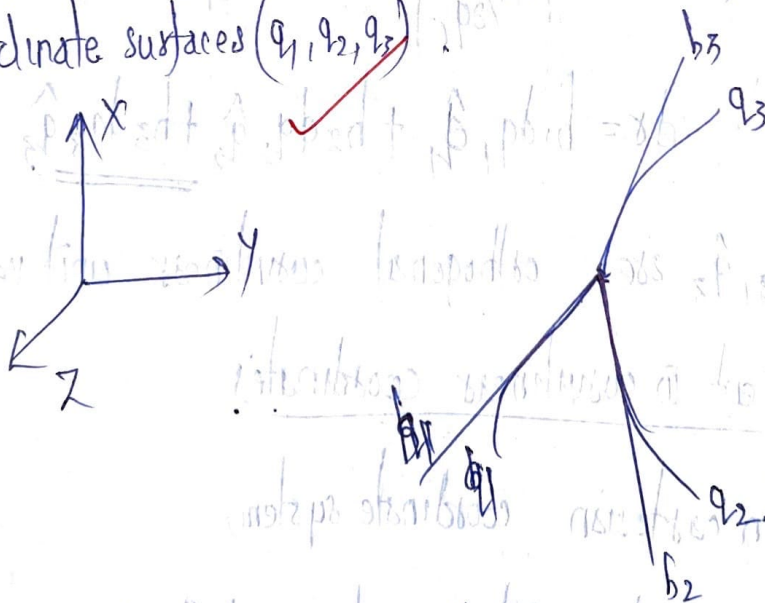
Part-C

Coordinate systems for physics

15.

The physical laws can be best expressed in terms of vectors. But the vectors need to be in appropriate coordinates before solving the physical problem. For example, a particle moving in a central force field has axial spherical symmetry, it can be represented by spherical polar coordinates and cylindrical polar coordinates can be used to describe a charged particle moving in a helical path having axial symmetry.

Like A point $P(x, y, z)$ is represented by ^{intersection of} 3 mutually perpendicular axes. Likewise in curvilinear coordinates, a point is represented by intersection of three mutually perpendicular coordinate surfaces (q_1, q_2, q_3) .



The intersection of three mutually perpendicular curves is called coordinate lines and the tangents to which at the intersection gives the coordinate axes.

Element of displacement

Let \vec{r} be a point defined as,

$$\vec{r} = r(q_1, q_2, q_3)$$

$$d\vec{r} = \frac{\partial r}{\partial q_1} dq_1 + \frac{\partial r}{\partial q_2} dq_2 + \frac{\partial r}{\partial q_3} dq_3$$

$$dr = b_1 dq_1 + b_2 dq_2 + b_3 dq_3 \quad \text{--- (1)}$$

b_i is the base vector, in the direction of change of ' r_i ' which depends on coordinates q_1, q_2, q_3 .

A unit vector is defined as,

$$\hat{q}_i = \frac{\partial r / \partial q_i}{\left| \partial r / \partial q_i \right|} = \frac{b_i}{|b_i|} = \frac{b_i}{h_i}$$

$$dr = h_1 dq_1 \hat{q}_1 + h_2 dq_2 \hat{q}_2 + h_3 dq_3 \hat{q}_3$$

$\hat{q}_1, \hat{q}_2, \hat{q}_3$ are orthogonal curvilinear unit vectors.

Gradient in curvilinear coordinates

In cartesian coordinate system,

$$\nabla \phi = \frac{\partial \phi}{\partial x} \hat{i} + \frac{\partial \phi}{\partial y} \hat{j} + \frac{\partial \phi}{\partial z} \hat{k}$$

In curvilinear coordinates,

$$\nabla \phi = \frac{\partial \phi}{h_1 \partial q_1} \hat{q}_1 + \frac{\partial \phi}{h_2 \partial q_2} \hat{q}_2 + \frac{\partial \phi}{h_3 \partial q_3} \hat{q}_3$$

$$\nabla = \frac{\partial}{h_1 a q_1} \hat{q}_1 + \frac{\partial}{h_2 a q_2} \hat{q}_2 + \frac{\partial}{h_3 a q_3} \hat{q}_3$$

~~Laplacean operator~~

$$\nabla^2 \phi = \nabla \cdot (\nabla \phi)$$

Divergence in curvilinear coordinates

Applying Gauss divergence theorem,

$$\vec{A} = A_1 \hat{q}_1 + A_2 \hat{q}_2 + A_3 \hat{q}_3$$

$$\int_V (\nabla \cdot \vec{A}) dV = \int_S \vec{A} \cdot d\vec{s} \quad (1)$$

Considering the contribution of surfaces q_1 perpendicular to the surface integral,

$$\begin{aligned} (A_1 ds)_{q_1 + dq_1} - (A_1 ds)_{q_1} &= (A_1 \cdot dq_2 dq_3)_{q_1 + dq_1} - (A_1 \cdot dq_2 dq_3)_{q_1} \\ &= \frac{\partial}{\partial q_1} (A_1 dq_2 dq_3) dq_1 \end{aligned}$$

$$= \frac{\partial}{\partial q_1} (A_1 h_2 h_3 dq_2 dq_3)$$

$$= \frac{1}{h_1 h_3} \frac{\partial}{\partial q_1} A_1 (dq_1 dq_2 dq_3)$$

$$= \frac{\partial}{\partial q_1} \frac{1}{h_2 h_3 h_1} \frac{\partial}{\partial q_1} (A_1 dq_1 dq_2 dq_3) dV$$

comparing with L.H.S of (1)

$$\int (\nabla \cdot A_1) dV = \frac{1}{h_2 h_3 h_1} \frac{\partial}{\partial q_1} (A_1 h_2 h_3)$$

In general,

$$\nabla \cdot A = \frac{1}{h_1 h_2 h_3} \left\{ \frac{\partial}{\partial q_1} (A_1 h_2 h_3) + \frac{\partial}{\partial q_2} (A_2 h_1 h_3) + \frac{\partial}{\partial q_3} (A_3 h_1 h_2) \right\}$$

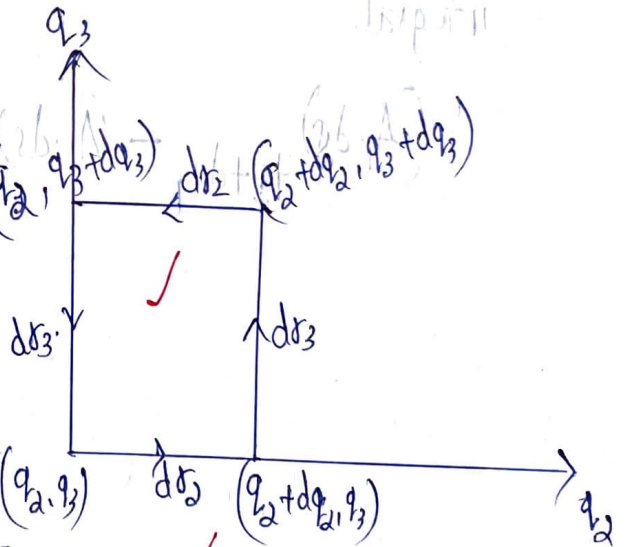
→ Laplacean operator $\nabla^2 \phi = \nabla \cdot (\nabla \phi)$
Curl in curvilinear coordinates

Applying Stokes theorem,

$$\int_S (\nabla \times A) \cdot d\mathbf{s} = \oint A \cdot d\mathbf{r} \quad \text{--- (2)}$$

Let $\vec{A} = A_1 \hat{i} + A_2 \hat{j} + A_3 \hat{k}$

consider a loop.



$$\begin{aligned} \oint A \cdot d\mathbf{r} &= (A_2 dq_2)_{q_3} + (A_3 dq_3)_{q_2 + dq_2} - (A_2 dq_2)_{q_3 + dq_3} - (A_3 dq_3)_{q_2} \\ &= (A_3 dq_3)_{q_2 + dq_2} - (A_3 dq_3)_{q_2} - \left\{ (A_2 dq_2)_{q_3 + dq_3} - (A_2 dq_2)_{q_3} \right\} \\ &= \frac{\partial}{\partial q_2} (A_3 dq_3) dq_2 - \frac{\partial}{\partial q_3} (A_2 dq_2) dq_3 \\ &= \frac{\partial}{\partial q_2} (A_3 h_3 dq_2 dq_3) - \frac{\partial}{\partial q_3} (A_2 dq_2 h_2 dq_3) \\ &= \left(\frac{\partial}{\partial q_2} (A_3 h_3) - \frac{\partial}{\partial q_3} (A_2 h_2) \right) dq_2 dq_3 \end{aligned}$$

$$\begin{aligned} \therefore (\nabla \times A)_1 ds &= (\nabla \times A)_1 dx_2 dx_3 \\ &= (\nabla \times A)_1 h_2 dq_2 h_3 dq_3 \end{aligned}$$

$$\begin{aligned} \therefore \oint_S (\nabla \times A)_1 ds &= \frac{1}{h_2 h_3} \left\{ \frac{\partial}{\partial q_2} (A_3 h_3) - \frac{\partial}{\partial q_3} (A_2 h_2) \right\} \\ &= \frac{h_1}{h_1 h_2 h_3} \left(\frac{\partial}{\partial q_2} (A_3 h_3) - \frac{\partial}{\partial q_3} (A_2 h_2) \right) \end{aligned}$$

It can be written as,

$$\nabla \times A = \begin{vmatrix} \hat{q}_1 & \hat{q}_2 & \hat{q}_3 \\ \frac{\partial}{\partial q_1} & \frac{\partial}{\partial q_2} & \frac{\partial}{\partial q_3} \\ A_1 h_1 & A_2 h_2 & A_3 h_3 \end{vmatrix}$$

A+

16. Covariant differentiation of covariant vectors

Let A_p be transformed into \bar{A}_π

$$\bar{A}_\pi = \frac{\partial x^p}{\partial x^\pi} A_p$$

Differentiating w.r.t x^v

$$\begin{aligned} \frac{\partial \bar{A}_\pi}{\partial x^v} &= \frac{\partial}{\partial x^v} \left(\frac{\partial x^p}{\partial x^\pi} A_p \right) = \frac{\partial x^p}{\partial x^\pi} \frac{\partial A_p}{\partial x^v} + \frac{\partial^2 x^p}{\partial x^v \partial x^\pi} A_p \\ &= \frac{\partial x^p}{\partial x^\pi} \frac{\partial x^q}{\partial x^v} \frac{\partial A_p}{\partial x^q} + \frac{\partial^2 x^p}{\partial x^\pi \partial x^v} A_p \end{aligned}$$

The 2nd term ^{on R.H.S} suggests that the derivative $\frac{\partial \bar{A}_\mu}{\partial x^\nu}$ do not transform like a tensor. We need those quantities obtained through partial differentiation and transform like tensors, for that we use,

$$\frac{\partial^2 x^p}{\partial x^\mu \partial x^\nu} = \frac{\partial x^p}{\partial x^\lambda} \Gamma_{\mu\nu}^\lambda - \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} \Gamma_{\alpha\beta}^p.$$

$$\begin{aligned} \frac{\partial \bar{A}_\mu}{\partial x^\nu} &= \frac{\partial x^p}{\partial x^\mu} \frac{\partial x^q}{\partial x^\nu} \frac{\partial A_p}{\partial x^q} + \left(\frac{\partial x^p}{\partial x^\lambda} \Gamma_{\mu\nu}^\lambda - \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} \Gamma_{\alpha\beta}^p \right) A_p \\ &= \frac{\partial x^p}{\partial x^\mu} \frac{\partial x^q}{\partial x^\nu} \frac{\partial A_p}{\partial x^q} + \Gamma_{\mu\nu}^\lambda \bar{A}_\lambda - \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} \Gamma_{\alpha\beta}^p A_p. \end{aligned}$$

$$\frac{\partial \bar{A}_\mu}{\partial x^\nu} - \Gamma_{\mu\nu}^\lambda \bar{A}_\lambda = \frac{\partial x^p}{\partial x^\mu} \frac{\partial x^q}{\partial x^\nu} \frac{\partial A_p}{\partial x^q} - \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} \Gamma_{\alpha\beta}^p A_p.$$

Interchanging dummy indices. $p=\alpha, q=\beta$ and resubstituting $p=\alpha$

$$\frac{\partial \bar{A}_\mu}{\partial x^\nu} - \Gamma_{\mu\nu}^\lambda \bar{A}_\lambda = \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} \left(\frac{\partial A_\alpha}{\partial x^\beta} - \Gamma_{\alpha\beta}^\gamma A_\gamma \right)$$

Introducing comma notation,

$$\frac{\partial \bar{A}_\mu}{\partial x^\nu} - \Gamma_{\mu\nu}^\lambda \bar{A}_\lambda = A_{\mu;\nu}$$

$$A_{\mu;\nu} = \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} (A_{\alpha;\beta})$$

This transform like a tensor of rank 2, hence this is the covariant derivative of \bar{A} of covariant vector.

Covariant differentiation of contravariant vector

Let A^α be transformed like

$$\bar{A}^\mu = \frac{\partial \bar{x}^\mu}{\partial x^\alpha} A^\alpha$$

Differentiating w.r.t \bar{x}^ν

$$\begin{aligned} \frac{\partial \bar{A}^\mu}{\partial \bar{x}^\nu} &= \frac{\partial}{\partial \bar{x}^\nu} \left(\frac{\partial \bar{x}^\mu}{\partial x^\alpha} A^\alpha \right) \\ &= \frac{\partial}{\partial x^\beta} \left(\frac{\partial \bar{x}^\mu}{\partial x^\alpha} A^\alpha \right) \frac{\partial x^\beta}{\partial \bar{x}^\nu} \\ &= \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial \bar{x}^\nu} \frac{\partial A^\alpha}{\partial x^\beta} + \frac{\partial^2 \bar{x}^\mu}{\partial x^\alpha \partial x^\beta} \frac{\partial x^\beta}{\partial \bar{x}^\nu} A^\alpha \end{aligned}$$

The 2nd term on R.H.S shows that $\frac{\partial \bar{A}^\mu}{\partial \bar{x}^\nu}$ do not transform like a tensor. Hence we need to transform the derivative as tensor, we use,

$$\frac{\partial^2 x^\rho}{\partial x^\mu \partial x^\nu} = \frac{\partial x^\rho}{\partial x^\lambda} \Gamma_{\mu\nu}^\lambda - \frac{\partial x^\alpha}{\partial x^\mu} \frac{\partial x^\beta}{\partial x^\nu} \Gamma_{\alpha\beta}^\rho$$

Interchanging x and \bar{x} coordinates,

$$\frac{\partial^2 \bar{x}^\mu}{\partial x^\alpha \partial x^\beta} = \frac{\partial \bar{x}^\mu}{\partial x^\lambda} \Gamma_{\alpha\beta}^{\lambda\mu} - \frac{\partial \bar{x}^\sigma}{\partial x^\alpha} \frac{\partial \bar{x}^\lambda}{\partial x^\beta} \Gamma_{\sigma\lambda}^\mu$$

$$\therefore \frac{\partial \bar{A}^\mu}{\partial \bar{x}^\nu} = \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial \bar{x}^\nu} \frac{\partial A^\alpha}{\partial x^\beta} + \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \Gamma_{\alpha\beta}^{\lambda\mu} \frac{\partial x^\beta}{\partial \bar{x}^\nu} A^\alpha - \frac{\partial \bar{x}^\sigma}{\partial x^\alpha} \frac{\partial \bar{x}^\lambda}{\partial \bar{x}^\nu} \frac{\partial x^\beta}{\partial x^\beta} A^\alpha$$

$$\frac{\partial \bar{A}^\mu}{\partial \bar{x}^\nu} = \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial \bar{x}^\nu} \frac{\partial A^\alpha}{\partial x^\beta} + \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \Gamma_{\alpha\beta}^{\lambda\mu} \frac{\partial x^\beta}{\partial \bar{x}^\nu} A^\alpha - \frac{\partial \bar{x}^\sigma}{\partial x^\alpha} \bar{\Gamma}_{\sigma\nu}^\lambda A^\alpha \quad 37$$

$$= \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial x^\nu} \frac{\partial A^\alpha}{\partial x^\beta} + \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \Gamma_{\alpha\beta}^\gamma \frac{\partial x^\beta}{\partial x^\nu} A^\alpha - \frac{\partial \bar{x}^\sigma}{\partial x^\alpha} A^\sigma$$

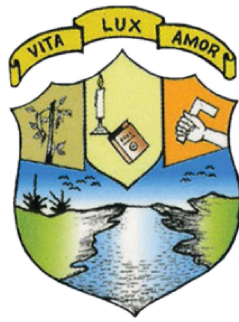
$$= \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial x^\nu} \frac{\partial A^\alpha}{\partial x^\beta} + \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \Gamma_{\alpha\beta}^\gamma \frac{\partial x^\beta}{\partial x^\nu} A^\alpha - \bar{A}^\sigma$$

$$\frac{\partial \bar{A}^\mu}{\partial x^\nu} - \Gamma_{\alpha\beta}^\gamma \bar{A}^\sigma = \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial x^\nu} \left(\frac{\partial A^\alpha}{\partial x^\beta} - \Gamma_{\alpha\beta}^\gamma A^\alpha \right)$$

$$\bar{A}_{\mu;\nu} = \frac{\partial \bar{A}^\mu}{\partial x^\nu} - \Gamma_{\alpha\beta}^\gamma \bar{A}^\sigma$$

$$\therefore \bar{A}_{\mu;\nu} = \frac{\partial \bar{x}^\mu}{\partial x^\alpha} \frac{\partial x^\beta}{\partial x^\nu} (A_{\alpha;\beta})$$

This transform like a tensor of rank two, hence this is covariant derivative of \bar{A}^μ w.r.t x^ν .



GRIEVANCE PROCEDURE

From,

Catherin Neena Lahu

No: 62

I MSc Physics

To,

Prof. Augustine J. Edakkara

Department of Physics

Respected Sir,

As I was affected with covid, I could not attend the internal exams conducted last week. So, I humbly request you for a re-test of the same. Expecting your kind consideration,

Yours faithfully,

Catherin Neena Lahu

Catherin

Recommended and forwarded to the internal co-ordinator

Dr. Thoman V. Malheir

Augustine J Edakkara

Dr. Thoman V. Malheir

Aaron Joseph Chacko

IInd DC

PHYSICS

Class Tutor IInd DC

Physics Department

Sub: - Request for Reappearance of Ist Sem internal exam.

Sir,

I am writing this letter in order to request you to grant me another chance to appear for the First Semester Internals exam on Physics, which was conducted on the 19th of September 2021, as I was unable to attend the same due to health issues.

Thanking You

Yours truly

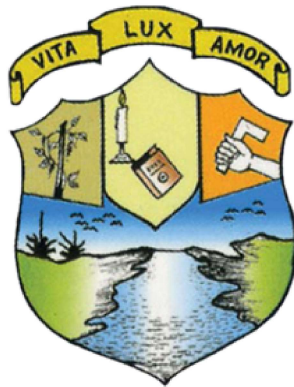
Aaron Joseph Chacko

~~Aaron Joseph Chacko~~

Recommended and forwarded to the internal co-ordinator

~~J. Mathew~~
Dr. Jabin Gob Mathew


Dr. Thomen V Mathew



INTERNAL MARKLISTS

2020-2021



Mahatma Gandhi University

KOTTAYAM - 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)

CENTRE No: 14/E020

PROGRAMME: M.Sc. Mathematics

Name of the College: ST.THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	ME010201 : Advanced Abstract Algebra		ME010202: Advanced Topology		ME010203: Numerical Solution with Python		ME010204: Complex Analysis		ME010205: Measure and Integration		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011015357	ADHEENA VIJAYAKUMAR	5	A+	5	A+	5	A+	5	A+	5	A+	
2	190011015358	ALNA JAMES	5	A+	4.8	A+	4.8	A+	5	A+	5	A+	
3	190011015359	ALPHONSA SHAJI	5	A+	5	A+	5	A+	5	A+	5	A+	
4	190011015360	AMRUTHA GOPALAKRISHNAN	5	A+	5	A+	5	A+	5	A+	5	A+	
5	190011015361	ANJU FRANCIS	5	A+	5	A+	5	A+	5	A+	5	A+	
6	190011015362	ANNET GEORGE	5	A+	4.8	A+	5	A+	5	A+	4.8	A+	
7	190011015363	CAROLINE THERESE	4.8	A+	4.8	A+	5	A+	4.8	A+	4.8	A+	
8	190011015364	DIMPLE T THENGUMPALLIL	5	A+	5	A+	5	A+	5	A+	5	A+	
9	190011015365	HARIPRIYA J	5	A+	5	A+	5	A+	5	A+	5	A+	
10	190011015366	LINTA JOSEPH	4.8	A+	4.8	A+	5	A+	4.8	A+	4.8	A+	
11	190011015367	MAGGI THOMAS	4.8	A+	4.8	A+	5	A+	4.8	A+	4.8	A+	
12	190011015368	MARIA GEO	5	A+	5	A+	5	A+	5	A+	5	A+	
13	190011015369	MARIET GRACE	5	A+	5	A+	5	A+	5	A+	5	A+	
14	190011015370	SEENU THOMAS	5	A+	5	A+	5	A+	5	A+	5	A+	
15	190011015371	SHARON ROSE BENNY	4.8	A+	4.8	A+	4.8	A+	4.8	A+	4.8	A+	
16	190011015372	SHERIN SEBASTIAN	5	A+	5	A+	5	A+	5	A+	5	A+	
17	190011015373	SHILPA ELIZABETH JOYCHEN	5	A+	5	A+	5	A+	5	A+	5	A+	
18	190011015374	SOORYA S S	4.8	A+	4.8	A+	4.8	A+	4.8	A+	4.8	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission.

2. These assessments were published and no grievances were from the students are pending.

Dr. Raj Mathew
Name & Signature of the
TEACHER-IN-CHARGE

(College Seal)

Thankachan
Name & Signature of the
HEAD OF THE DEPARTMENT
Thankachan Augustine



Dr. James John
Principal I/C
Name & Signature of the
PRINCIPAL
St. Thomas College, Palai



Mahatma Gandhi University

KOTTAYAM - 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)


CENTRE No: 14/E020

PROGRAMME: M.Sc. Statistics

Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	ST500201: Estimation Theory		ST500202: Stochastic Processes		ST500203: Multivariate Distributions		ST010201: Advanced Probability Theory		ST010202: Statistical Computing II Using R		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	GPA	GPA	GPA	GPA	GPA	GPA	Grade	GPA	Grade	
1	190011020436	AKHITHA SASI	4.2	4.4	4.4	4.2	4.6	4.6	4.4	A	4.6	A+	
2	190011020437	ALIGA BASTIN	4.2	4.2	4.4	4	4.6	4.6	4.2	A	4.6	A+	
3	190011020438	AMRUTHENDU M	4.8	4.6	5	4.6	5	5	4.6	A+	5	A+	
4	190011020439	ANAGHA BABY	5	4.8	5	4.8	5	5	4.8	A+	5	A+	
5	190011020440	ANANDALEKSHMI K S	5	5	5	5	5	5	5	A+	5	A+	
6	190011020441	ANJU MARY KURIAN	5	5	5	5	5	5	5	A+	5	A+	
7	190011020442	APARNA S	4.2	4.2	4.4	4	4.6	4.6	4.2	A	4.6	A+	
8	190011020443	ATHIRA K R	4.4	4.2	4.4	4.2	4.6	4.6	4.2	A	4.6	A+	
9	190011020444	ATHIRA K S	4.8	4.8	5	4.6	5	5	4.8	A+	5	A+	
10	190011020445	JUSTIN GEORGE	4.8	4.8	4.8	4.8	5	5	4.8	A+	5	A+	
11	190011020446	LITTY DEVACHEN	5	5	5	5	5	5	5	A+	5	A+	
12	190011020447	MINNU ELIZABETH JOE	4.6	4.6	4.6	4.6	4.8	4.8	4.6	A+	4.8	A+	
13	190011020448	PRIYAMKA M	4.2	4	4.2	4	4.6	4.6	4	A	4.6	A+	
14	190011020449	RIVAN JOSE	4.4	4.2	4.4	4.2	4.8	4.8	4.2	A	4.8	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
 2. These assessments were published and no grievances were from the students are pending


 Name & Signature of the
 TEACHER-IN-CHARGE

(College Seal)


 Name & Signature of the
 HEAD OF THE DEPARTMENT




 Dr. James John
 Name & Signature of the
 PRINCIPAL
 St. Thomas College, Palai



Mahatma Gandhi University

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FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com)-CSS (2019 admission)

CENTRE No: 14/E020

PROGRAMME: M.Sc. Physics


Name of the College: ST.THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	PH010201 Mathematical Methods in Physics - II		PH010202 Quantum Mechanics -I		PH010203 Statistical Mechanics		PH010204 Condensed Matter Physics		PH0101P General Physics Practicals		PH0102P Electronics Practicals		Remarks
			Theory		Theory		Theory		Theory		Practical		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011018777	ABHIRAMI V.T	5.0	A ⁺	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	
2	190011018778	AKHILA BENNY	4.6	A ⁺	4.8	A ⁺	4.8	A ⁺	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	
3	190011018779	AKHILA SUDHAKAR	4.8	A ⁺	4.6	A ⁺	4.6	A ⁺	4.6	A ⁺	5.0	A ⁺	5.0	A ⁺	
4	190011018780	ALEENA JOSE	4.4	A	4.4	A	4.8	A ⁺	4.6	A ⁺	4.8	A ⁺	4.8	A ⁺	
5	190011018781	AMALA SHAJI	4.8	A ⁺	4.6	A ⁺	4.4	A	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	
6	190011018782	ANIT ALPHONSE PAULOSE	4.4	A	4.4	A	4.4	A	4.4	A	4.8	A ⁺	4.8	A ⁺	
7	190011018783	ANN SANDRA JOSEPH	4.6	A ⁺	4.8	A ⁺	4.8	A ⁺	4.6	A ⁺	5.0	A ⁺	5.0	A ⁺	
8	190011018784	ASWATHY RAVEENDRAN	4.6	A ⁺	4.8	A ⁺	4.8	A ⁺	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	
9	190011018785	DINTA SKARIA	4.8	A ⁺	4.8	A ⁺	4.8	A ⁺	4.8	A ⁺	4.8	A ⁺	4.8	A ⁺	
10	190011018786	GOPIKA G NAIR	4.6	A ⁺	4.4	A	4.8	A ⁺	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	
11	190011018787	JERIN SUNNY	4.4	A	4.4	A	4.2	A	4.4	A	5.0	A ⁺	5.0	A ⁺	
12	190011018788	JISNA JAMES	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	
13	190011018789	JOMAL GEORGE	4.6	A ⁺	4.6	A ⁺	4.2	A	4.6	A ⁺	4.8	A ⁺	4.8	A ⁺	
14	190011018790	MARIA THOMAS	4.8	A ⁺	5.0	A ⁺	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	
15	190011018791	RAISA ALEX	5.0	A ⁺	5.0	A ⁺	4.8	A ⁺	5.0	A ⁺	5.0	A ⁺	5.0	A ⁺	

Certified that: 1. The entries are verified with the records and there is no error or omission
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 Augustine J Edakkal
 Name & Signature of the
 TEACHER-IN- CHARGE

(College Seal)


 Dr. Ison V. Vanchipurackal
 Head, Department of Physics
 St. Thomas College, Palai
 Name & Signature of the
 HEAD OF THE DEPARTMENT




 Dr. James John
 Name & Signature of the
 St. PRINCIPAL, Palai.

Sl. No.	Reg. No.	Name of the Candidate	PH010201 Mathematical Methods in Physics - II		PH010202 Quantum Mechanics - I		PH010203 Statistical Mechanics		PH010204 Condensed Matter Physics		PH0101P General Physics Practicals		PH0102P Electronics Practicals		Remarks
			Theory		Theory		Theory		Theory		Practical		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
16	190011018792	RAVISANKAR K PEETHAMBARAN	4.4	A	4.6	A+	4.0	A	4.4	A	4.8	A+	4.8	A+	
17	190011018793	ROSE TERESE SHIBU	4.6	A+	4.8	A+	4.8	A+	5.0	A+	5.0	A+	5.0	A+	
18	190011018794	SETHULAKSHMI SAJEEV	4.8	A+	5.0	A+	5.0	A+	5.0	A+	5.0	A+	5.0	A+	
19	190011018795	SONA SOMAN	4.4	A	4.6	A+	4.4	A	4.6	A	4.8	A+	4.8	A+	
20	190011018796	SREELAKSHMI P M	4.6	A+	4.6	A+	4.8	A+	4.8	A+	4.8	A+	4.8	A+	
21	190011018797	UNNIMAYA R	5.0	A+	5.0	A+	5.0	A+	5.0	A+	5.0	A+	5.0	A+	
22	190011018798	URMILA RAO	5.0	A+	5.0	A+	5.0	A+	5.0	A+	5.0	A+	5.0	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending



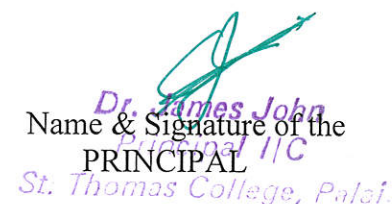
Augustine J Edakkara
Name & Signature of the
TEACHER-IN- CHARGE

(College Seal)



Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. Ison V. Vanchipurackal
Head, Department of Physics
St. Thomas College, Palai
Arunapuram P.O., Kottayam Dist., Kerala-686 574
Mobile:9446126926, Email: isonv@rediffmail.com



Dr. James John
Name & Signature of the
PRINCIPAL
St. Thomas College, Palai.





Mahatma Gandhi University

KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - FIRST SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M. Com)-CSS (2019 admission onwards)

CENTRE No: 14/E020

PROGRAMME: M.Sc. Chemistry

Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	CH 50 02 01 Coordination Chemistry		CH 50 02 05 Inorganic Chemistry Practicals-I		CH 50 02 02 Organic Reaction Mechanism		CH 50 02 06 Organic Chemistry Practicals-I		CH 50 02 03 Chemical Bonding and Computational Chemistry		CH 50 02 06 Physical Chemistry Practicals-I		CH 50 20 04 Molecular Spectroscopy		Remarks
			Theory		Practical		Theory		Practical		Theory		Practical		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011010029	ANNITA EMMANUEL	4.20	A	4.60	A+	4.20	A	4.60	A+	4.20	A	4.60	A+	4.00	A	
2	190011010030	AKHILA ANILKUMAR	4.40	A	4.60	A+	4.60	A+	5.00	A+	4.20	A	4.60	A+	4.40	A	
3	190011010031	ALBY SEL	4.40	A	4.60	A+	4.60	A+	5.00	A+	4.20	A	4.60	A+	4.40	A	
4	190011010032	ALEENA ELIZABETH ALEX	4.60	A+	5.00	A+	4.60	A+	5.00	A+	4.60	A+	5.00	A+	4.60	A+	
5	190011010033	ALPHONSA K	4.80	A+	5.00	A+	4.80	A+	5.00	A+	4.80	A+	5.00	A+	4.40	A	
6	190011010034	ARCHANA MADHU	4.20	A	4.60	A+	4.40	A	4.60	A+	4.40	A	4.60	A+	4.40	A	
7	190011010035	ASHNA SANTHOSH	4.80	A+	5.00	A+	4.40	A	4.60	A+	4.60	A+	5.00	A+	4.80	A+	
8	190011010036	ATHIRA V S	4.40	A	4.60	A+	4.40	A	4.60	A+	4.00	A	4.60	A+	4.20	A	
9	190011010037	GANGA S NAIR	4.80	A+	5.00	A+	4.60	A+	5.00	A+	4.60	A+	5.00	A+	4.60	A+	
10	190011010038	GIYA MARTIN	4.00	A	4.60	A+	4.40	A	4.60	A+	4.00	A	4.60	A+	4.20	A	

Certified that: 1. The entries are verified with the records and there is no error or omission
 2. These assessments were published and no grievances were from the students are pending

Amal Jose Baby

Name & Signature of the
TEACHER-IN-CHARGE

(College Seal)

Name & Signature of the
 HEAD OF THE DEPARTMENT
 Research & P.G. Dept. of Chemistry
 St. Thomas College
 Pala - 686 574, Kerala, India

Name & Signature of the
 PRINCIPAL
 St. Thomas College, Pala,

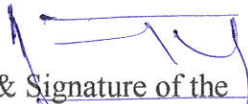
Sl. No.	Reg. No.	Name of the Candidate	CH 50 02 01 Coordination Chemistry		CH 50 02 05 Inorganic Chemistry Practicals-I		CH 50 02 02 Organic Reaction Mechanism		CH 50 02 06 Organic Chemistry Practicals-I		CH 50 02 03 Chemical Bonding and Computational Chemistry		CH 50 02 06 Physical Chemistry Practicals-I		CH 50 2004 Molecular Spectroscopy		Remarks
			Theory		Practical		Theory		Practical		Theory		Practical		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
11	190011010039	JYOTHILEKSHMI S	4.80	A+	5.00	A+	4.80	A+	5.00	A+	4.80	A+	5.00	A+	4.80	A+	
12	190011010040	LIZ TEENU MATHEWS	5.00	A+	5.00	A+	4.60	A+	5.00	A+	5.00	A+	5.00	A+	4.80	A+	
13	190011010041	MALU MATHEW	5.00	A+	5.00	A+	4.80	A+	5.00	A+	4.80	A+	5.00	A+	4.80	A+	
14	190011010042	MARIAT JAISON	4.60	A+	5.00	A+	4.40	A	4.60	A+	4.60	A+	5.00	A+	4.40	A	
15	190011010043	NITHYA R	4.40	A	4.60	A+	4.60	A+	5.00	A+	4.40	A	5.00	A+	4.20	A	
16	190011010044	RENCHU MATHEW	4.20	A	4.60	A+	4.40	A	4.60	A+	4.20	A	4.60	A+	4.20	A	
17	190011010045	ROMAL JOJO	4.20	A	4.60	A+	4.20	A	4.60	A+	4.20	A	4.60	A+	4.40	A	
18	190011010046	SNEHAMOL JOSE	4.00	A	4.60	A+	4.00	A	4.60	A+	4.00	A	4.60	A+	4.00	A	
19	190011010047	TONY MATHEW	4.00	A	4.60	A+	4.20	A	4.60	A+	4.00	A	4.60	A+	4.20	A	
20	190011009971	ROSMI REJI	4.00	A	4.60	A+	4.00	A	4.60	A+	4.00	A	4.60	A+	4.40	A	

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2. These assessments were published and no grievances were from the students are pending

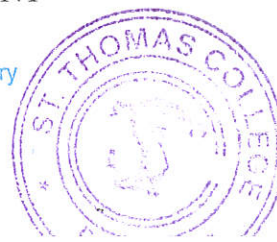
Amal Jose Baby 


Name & Signature of the
TEACHER-IN-CHARGE

(College Seal)


Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. SUNNY KURIAKOSE
Associate Professor & Head
Research & P.G. Dept. of Chemistry
St. Thomas College
Palai - 686 574, Kerala, India




Name & Signature of the
PRINCIPAL
St. Thomas College, Palai.



Mahatma Gandhi University

KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B-SECONDSEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) -CSS (2019 admission)

CENTRE No: 14/E020

PROGRAMME:M.Sc. Botany

Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	BY010201 Plant Anatomy, Developmental Biology and Horticulture		BY010202 Cell Biology, Genetics and Plant Breeding		BY010203 Plant Physiology and Biochemistry		BY010204 Molecular Biology		BY010205 Plant Anatomy, Developmental Biology, Horticulture, Cell Biology, Genetics and Plant Breeding - Practical		BY010206 Plant Physiology, Biochemistry and Molecular Biology Practical		Remarks
			Theory		Theory		Theory		Theory		Practical		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011008849	ADITHYA SHAJI	5	A+	5	A+	5	A+	5	A+	5	A+	5	A+	
2	190011008850	ANANTHA KRISHNAN M	5	A+	5	A+	5	A+	5	A+	5	A+	5	A+	
3	190011008851	IRINE THERASA DIUS	5	A+	5	A+	5	A+	5	A+	5	A+	5	A+	
4	190011008852	JYOTHI JOSE	4	A+	4	A	4	A	3.6	A	4.6	A+	4.8	A+	
5	190011008853	KESIYAMOL BENCHAMIN	3.6	A	3.5	A	3.6	A	3.6	A	4	A	4.4	A	
6	190011008854	KRISHNANAND.H	4.8	A	4.8	A+	4.8	A+	4.6	A+	5	A+	5	A+	
7	190011008855	MANEESHA MANOJ	4.2	A	4.3	A	4.2	A	4.0	A	4.6	A+	4.6	A+	
8	190011008856	SANDRA ELSA CHACKO	4	A	3.8	A	4	A	3.8	A	4.2	A	4.4	A	
9	190011008857	SATHYA PRIYA M.	4.8	A+	4.8	A+	4.8	A+	4.8	A+	5	A+	5	A+	
10	190011008858	SNEHA THOMAS	4.8	A+	4.8	A+	4.8	A+	4.6	A+	4.6	A+	4.6	A+	
11	190011008859	SUMI ANDREWS	4.4	A	4.4	A	4.4	A	4.4	A	4.6	A+	4.6	A+	
12	190011008860	VISHNUPRIYA N.R	4.2	A	4.3	A	4.2	A	4.2	A	4.6	A+	4.6	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
 2. These assessments were published and no grievances were from the students are pending

Name & Signature of the TEACHER-IN- CHARGE

(College Seal)

Name & Signature of the HEAD OF THE DEPARTMENT

Name & Signature of the PRINCIPAL

St. Thomas College



Mahatma Gandhi University

KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: M.A. English

Name of the College: ST.THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	EN010201: Modernity and Modernisms		EN010202: Postmodernism and Beyond		EN010203: American Literatures		EN010204: English Language History and Contemporary Linguistics		EN010205: Thinking Theory		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011002118	AGNES ANDREWS	4.40	A	4.40	A	4.40	A	4.40	A	4.20	A	
2	190011002119	AKSHAI P SASI	4.80	A+	4.80	A+	4.60	A+	4.80	A+	4.80	A+	
3	190011002120	ALAN GEORGE	4.20	A	4.20	A	4.20	A	4.20	A	4.20	A	
4	190011002121	ALEX P LUKE	4.60	A+	4.80	A+	4.60	A+	4.80	A+	4.60	A+	
5	190011002122	ALKA MARIA SIMON	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
6	190011002123	ANAKHA ROSE JACOB	4.80	A+	4.80	A+	4.60	A+	4.80	A+	4.80	A+	
7	190011002124	ANILA MARIA JOSEPH	4.80	A+	4.80	A+	4.80	A+	4.60	A+	4.80	A+	
8	190011002125	ANJITHA M S	4.80	A+	4.60	A+	4.60	A+	4.80	A+	4.80	A+	
9	190011002126	APARNA RAJALAKSHMI	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
10	190011002127	CATHERINE BABY	5.00	A+	4.80	A+	5.00	A+	5.00	A+	4.80	A+	
11	190011002128	CHAITHANYA JOYSON	4.80	A+	4.80	A+	4.80	A+	4.80	A+	4.80	A+	
12	190011002129	DEEPAK JOHNS	4.60	A+	4.60	A+	4.80	A+	4.80	A+	4.80	A+	
13	190011002130	FREDY FRANCIS	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
14	190011002131	GOURI GAYATHRI G	5.00	A+	4.80	A+	5.00	A+	5.00	A+	4.80	A+	
15	190011002132	JUBLE LUCKSON	4.80	A+	4.60	A+	4.80	A+	4.60	A+	4.80	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission

2. These assessments were published and no grievances were from the students are pending

JOSE MATHEW

Name & Signature of the
TEACHER-IN- CHARGE

(College Seal)

RAJU K. AUGUSTINE

Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. James John
Name & Signature of the
PRINCIPAL

St. Thomas College, Palai.

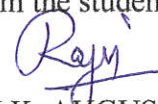
Sl. No.	Reg. No.	Name of the Candidate	EN010201: Modernity and Modernisms		EN010202: Postmodernism and Beyond		EN010203: American Literatures		EN010204: English Language History and Contemporary Linguistics		EN010205: Thinking Theory		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
16	190011002133	MANISHA C MATHEWS	4.20	A	4.20	A	4.20	A	4.40	A	4.20	A	
17	190011002134	MEENU SUNDARAN	4.40	A	4.40	A	4.20	A	4.40	A	4.40	A	
18	190011002135	MINU MATHEWS	4.80	A+	4.80	A+	4.60	A+	4.60	A+	5.00	A+	
19	190011002136	NEETHU P J	4.40	A	4.40	A	4.40	A	4.40	A	4.40	A	
20	190011002137	PEARLY S THOMAS	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
21	190011002138	PRASAD JOHNSON	4.80	A+	4.80	A+	5.00	A+	4.80	A+	4.60	A+	
22	190011002139	RAMYA ELIZABETH MATHEW	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
23	190011002140	ROSE MARY JAMES	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
24	190011002141	SANTHI M S	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
25	190011002142	SHEBY BABY	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
26	190011002143	SHEETHAL TRESA JOSEPH	-	-	-	-	-	-	-	-	-	-	
27	190011002144	SOUMYA KRISHNAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
28	190011002145	SUBIL RAJ	4.20	A	4.20	A	4.20	A	4.20	A	4.20	A	
29	190011002146	SUBITHA SUDHAKARAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
30	190011002147	TREESA THOMAS	4.80	A+	4.80	A+	5.00	A+	5.00	A+	4.80	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending



JOSE MATHEW
Name & Signature of the
TEACHER-IN- CHARGE

(College Seal)



RAJU K. AUGUSTINE
Name & Signature of the
HEAD OF THE DEPARTMENT




Dr. James John
Name & Signature of
Principal / IC
St. Thomas College, Palai.



Mahatma Gandhi University

KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com)-CSS (2019 admission onwards)


CENTRE No: 14/ E020

PROGRAMME: M.A. Malayalam

Name of the College: ST.THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	ML010201: Adhunikamalayala Kavitha: (Theory)		ML010202: Bhashasasthram (Theory)		ML010203: Keralasamskaram(Theory)		ML010204: Malayala Novel (Theory)		ML010205: Bharatheyasahithya sidhanthangal (Theory)		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011005746	ABHIJITH R NAIR	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
2	190011005747	ALVIN THANKACHAN	4.80	A+	4.80	A+	4.80	A+	4.80	A+	4.80	A+	
3	190011005748	AMALA TREESA JAMES	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
4	190011005749	ANISHA A MARIYA	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
5	190011005750	ANN ARDRA TOM	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
6	190011005751	CYRIL JOY	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
7	190011005752	DIAS FRANCIS	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
8	190011005753	GIGI GEORGE	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
9	190011005754	JINSHA JAYAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
10	190011005756	JOSNA T JOSEPH	4.80	A+	4.60	A+	4.60	A+	4.60	A+	4.60	A+	
11	190011005757	KEERTHI KUNJUMON	4.80	A+	4.80	A+	4.80	A+	4.80	A+	4.80	A+	
12	190011005758	NAYANA REVEENDRAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
13	190011005759	NAYANA THOMAS	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
14	190011005760	NEETHU BABY	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	

- Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending


Dr Thomas Scana

Name & Signature of the
TEACHER-IN- CHARGE

(College Seal)


Name & Signature of the
HEAD OF THE DEPARTMENT

DR. DAVIS XAVIER
Head of the Dept. of Malayalam
St. Thomas College, Palai




Name & Signature of the
PRINCIPAL
St. Thomas College, Palai.

Sl. No.	Reg. No.	Name of the Candidate	ML010201: Adhunikamalayala Kavitha: (Theory)		ML010202: Bhashasasthram (Theory)		ML010203: Keralasamskaram(T heory)		ML010204: Malayala Novel (Theory)		ML010205: Bharatheyasah ithya sidhanthangal (Theory)		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
15	190011005761	NEETHUMOL P R	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
16	190011005762	STEFIN NARAYANAN N L	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
17	190011005763	TEEZAMOL SEBASTIAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
18	190011005764	TOMS RAJU	4.80	A+	4.60	A+	4.60	A+	4.60	A+	4.80	A+	

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Dr. Thomas Scaria

Name & Signature of the
TEACHER-IN- CHARGE

(College Seal)


Davis

Name & Signature of the
HEAD OF THE DEPARTMENT

DR. DAVIS XAVIER
Head of the Dept. of Malayalam
St. Thomas College, Pala


Dr. James John
Name & Signature of the
PRINCIPAL
St. Thomas College, Palai.



MAHATMA GANDHI UNIVERSITY

INTERNAL ASSESSMENT (Theory) for P.G. PROGRAMME CSS (Effective from 2019 admissions)

Centre No: 14/ E020

College: ST.THOMAS COLLEGE, PALAI

Semester: Second Semester

Programme: M.A. Hindi

Title: HN010201 –History of Hindi Literature -II

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
231	190011004785	ABHIRAMI. A.S	A+	A+	A	A	4.60	A+	
232	190011004786	AJITH SASI	A	A	A	A	4.00	A	
233	190011004787	AKSHAYA MADHUSOODANAN	A+	A+	A	A	4.60	A+	
234	190011004788	ANEESH V NAIR	A+	A+	A+	A+	5.00	A+	
235	190011004789	ARATHY MADHUSOODHANAN	A+	A+	A+	A+	5.00	A+	
236	190011004790	ASHA Y. S.	A+	A+	A+	A	4.80	A+	
237	190011004791	ASWATHY SAJEEV	A+	A+	A	A	4.60	A+	
238	190011004792	DEVIKA KRISHNAKUMAR	A+	A+	A	A	4.60	A+	
239	190011004793	GOWRI PRIYA P. J	A+	A+	A	A	4.60	A+	
240	190011004794	JINCY SARA IDICULLA	A+	A+	A	A	4.60	A+	
241	190011004795	KARTHIKA SATHEESH	A+	A+	A	A	4.60	A+	
242	190011004796	LAKSHMI MOHAN	A+	A+	A+	A+	5.00	A+	
243	190011004797	LITTY . P.TOMS	A	A	A	A	4.00	A	
244	190011004798	MAYA RAJAPPAN	A+	A+	A+	A+	5.00	A+	

Certified that : 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Name & Signature of the
Teacher(s) in charge

Anish Gylac

Name & Signature of the
Head of the Department

Dr. CK James



Name & Signature
of the Principal

St. Thomas College, Palai,

Programme: M.A. Hindi

HNO10201
Title: Paper VIII—History of Hindi Literature II

Semester: Second Semester

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
245	190011004799	MILAN MARIA THOMAS	A+	A+	A+	A+	5.00	A+	
246	190011004800	SANGEETHA.P.S	A	A+	A	A	4.40	A	
247	190011004801	SHREE LAKSHMI S	A+	A+	A	A	4.60	A+	
248	190011004802	SOPHYA RAJ	A+	A+	A	A	4.60	A+	
249	190011004803	SRUTHIMOL M.K.	A	A+	A	A	4.40	A	
250	190011004804	SUDHY SURESH	A+	A+	A+	A+	5.00	A+	

Certified that : 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Name & Signature of the
Teacher(s) in charge

Amish Gyaac

Name & Signature of the
Head of the Department

Dr. C.K James

(College Seal)



Name & Signature
of the Principal

Dr. James John
Principal, I.C.
St. Thomas College, Palai.



Mahatma Gandhi University
KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B – SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: **M.A. Economics**

Name of the College: **ST. THOMAS COLLEGE, PALAI**

Sl. No.	Reg. No.	Name of the Candidate	EC010201 Microeconomics - II		EC010202 Macro Economics - II		EC010203 Public Economics		EC010204 Indian Economy-II		EC010205 Statistical Methods for Economic Analysis		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011000589	AKSHAYA K M	3.60	B	4.20	A	3.80	B	3.40	B	4.20	A	
2	190011000590	ALBIN BINOY	4.80	A+	4.40	A	4.80	A+	4.60	A+	4.80	A+	
3	190011000591	ALEENA JOSEPH	4.20	A	4.40	A	4.00	A	4.20	A	4.60	A+	
4	190011000592	ANCILET RANI THOMAS	4.00	A	4.20	A	4.00	A	3.80	B	4.20	A	
5	190011000593	ANGELIN MARY GEORGE	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
6	190011000594	ANKITA TOMY	4.60	A+	4.60	A+	4.80	A+	5.00	A+	5.00	A+	
7	190011000595	ANMOL VARGHESE	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
8	190011000596	ANN MARY JOSE	4.60	A+	4.60	A+	4.60	A+	4.60	A+	4.80	A+	
9	190011000597	ANNU SUNNY	4.20	A	4.60	A+	4.40	A	4.40	A	4.60	A+	
10	190011000598	ANU MARIA JAISON	4.40	A	4.60	A+	4.60	A+	4.60	A+	4.60	A+	
11	190011000599	ASHAMOL V . G	3.80	B	4.40	A	4.00	A	3.60	B	4.20	A	
12	190011000600	CLAREES DOMINIC	4.00	A	4.40	A	4.00	A	3.20	B	4.40	A	
13	190011000601	DIYA SUSAN BABY	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
14	190011000602	DONIA MATHEW	4.40	A	4.40	A	4.20	A	4.80	A+	4.60	A+	
15	190011000603	FEBA ELIZABETH BIJU	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	

Statistical for Econor Analysis

Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending

JOJI JACOB

Dr. BIJU K.C.

Dr. JAMES JOHN

Name & Signature of the
TEACHER-IN- CHARGE

(College Seal)

Name & Signature of the
HEAD OF THE DEPARTMENT

Name & Signature of the
PRINCIPAL




Sl. No.	Reg. No.	Name of the Candidate	EC010201 Microeconomics - II		EC010202 Macro Economics - II		EC010203 Public Economics		EC010204 Indian Economy-II		EC010205 Statistical Methods for Economic Analysis		Remarks	Statistical for Econo Analysis
			Theory		Theory		Theory		Theory		Theory			
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade		
16	190011000604	LIJO JOY	3.80	B	4.00	A	3.80	B	4.20	A	4.20	A		
17	190011000605	MATHU MATHEW	4.40	A	4.40	A	4.20	A	4.20	A	4.40	A		
18	190011000606	MEERA GOPI	3.60	B	4.20	A	3.80	B	3.20	B	4.20	A		
19	190011000607	MINNA MARY TOM	4.80	A+	4.40	A	4.80	A+	5.00	A+	5.00	A+		
20	190011000608	REKHA P. GEORGE	4.60	A+	4.00	A	4.40	A	4.60	A+	4.60	A+		
21	190011000609	REMYA JACOB	4.40	A	4.00	A	4.20	A	4.20	A	4.40	A		
22	190011000610	SAM NINAN	4.40	A	4.00	A	4.20	A	4.60	A+	4.40	A		
23	190011000611	SANDRA C JOSE	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+		
24	190011000612	SHELVIN THOMAS JACOB	4.60	A+	4.20	A	4.40	A	4.40	A	4.60	A+		
25	190011000613	SRUTHI M K	3.60	B	4.00	A	3.80	B	3.20	B	4.20	A		
26	190011000614	STELLA T .YOHANNAN	3.80	B	4.00	A	3.80	B	3.60	B	4.20	A		
27	190011000615	SUJITHRA. P. S	3.60	B	4.00	A	3.80	B	4.20	A	4.40	A		
28	190011000616	VISHNUPRIYA V . N.	4.80	A+	4.80	A+	5.00	A+	5.00	A+	5.00	A+		

Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending


JOJI JACOB
Name & Signature of the
TEACHER-IN- CHARGE




Dr. BIJU K.C.
Name & Signature of the
HEAD OF THE DEPARTMENT


Dr. JAMES JOHN
Name & Signature of the
PRINCIPAL



Mahatma Gandhi University

KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc. /M.Com)-CSS (2019 admission onwards)

CENTRE No: 14/E020

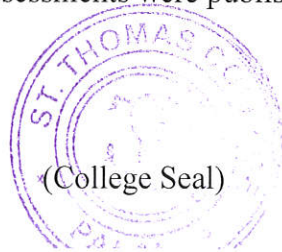
PROGRAMME: M.A. Politics

Name of the College: ST.THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	PS010201: Political Sociology		PS010202: Western Political Thought: Modern Traditions		PS010203: Issues in Indian Politics		PS010204: Indian Administration		PS010205: Theoretical Foundations of International Relations		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011006906	AJAL JAMES	5.00	A+	4.60	A+	5.00	A+	5.00	A+	5.00	A+	
2	190011006907	AKHIL SHAJI	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
3	190011006908	AKHILA GEORGE	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
4	190011006909	ALBIN P.S	4.40	A	3.60	B	4.40	A	4.40	A	4.60	A+	
5	190011006910	ANJALY ZACHARIAS	4.60	A+	4.60	A+	4.80	A+	4.80	A+	4.80	A+	
6	190011006911	ANJU.A	4.60	A+	3.60	B	4.60	A+	4.60	A+	4.20	A	
7	190011006912	ANU CYRIAC	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
8	190011006913	ARYA BABU	4.40	A	4.20	A	4.40	A	4.40	A	4.40	A	
9	190011006914	ASWATHY KRISHNA	5.00	A+	5.00	A+	5.00	A+	4.80	A+	5.00	A+	
10	190011006915	EDWIN JAISE	4.40	A	4.20	A	4.40	A	4.60	A+	4.40	A	
11	190011006916	GOPIKA ANIL	4.80	A+	4.60	A+	4.60	A+	5.00	A+	5.00	A+	
12	190011006917	GRACE MARY	4.80	A+	5.00	A+	4.80	A+	4.80	A+	4.80	A+	
13	190011006918	JERIN ANNIE GEORGE	4.60	A+	3.60	B	4.60	A+	4.60	A+	4.60	A+	
14	190011006919	JOSE TOM	4.40	A	3.60	B	4.40	A	4.40	A	4.60	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
 2. These assessments were published and no grievances were from the students are pending

Sijo K. Manuel
 Name & Signature of the
 TEACHER-IN- CHARGE



For HOD
 Dr. Stany Thomas
 Name & Signature of the
 HEAD OF THE DEPARTMENT

Dr. James John
 Name & Signature of the
 PRINCIPAL

Sl. No.	Reg. No.	Name of the Candidate	PS010201: Political Sociology		PS010202: Western Political Thought: Modern Traditions		PS010203: Issues in Indian Politics		PS010204: Indian Administration		PS010205: Theoretical Foundations of International Relations		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
15	190011006920	JUSTINE GEORGE	4.40	A	3.60	B	4.40	A	4.60	A+	4.60	A+	
16	190011006921	K K AIAPPADAS	4.60	A+	4.60	A+	4.60	A+	4.60	A+	4.60	A+	
17	190011006922	LEKSHMI BIJU	4.40	A	4.20	A	4.40	A	4.40	A	4.60	A+	
18	190011006923	LEKSHMI SREE KUMAR	5.00	A+	4.60	A+	5.00	A+	4.60	A+	5.00	A+	
19	190011006924	MELVIN MATHEW	4.80	A+	4.60	A+	5.00	A+	4.60	A+	4.60	A+	
20	190011006925	NAVYAMOL S	4.40	A	4.00	A	4.40	A	4.40	A	4.60	A+	
21	190011006926	PAUL MATHEW	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
22	190011006927	PRAVEENA PRATHAPAN	4.60	A+	4.00	A	4.40	A	4.40	A	4.60	A+	
23	190011006928	STEVE SAM BABU	4.60	A+	3.60	B	4.40	A	4.60	A+	4.60	A+	
24	190011006929	VISHNU VIJAYAN	4.40	A	3.60	B	4.40	A	4.40	A	4.40	A	
25	190011006847	GAHANA NAVYA JAMES	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending

Sijo K. Manuel
Name & Signature of the
TEACHER-IN- CHARGE



For MOD
Dr. Stany Thomas
Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. James John
Name & Signature of the
PRINCIPAL



Mahatma Gandhi University
KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com)-CSS (2019 admission)

CENTRE No: 14/E020

PROGRAMME: M.A. History

Name of the College: **ST.THOMAS COLLEGE, PALAI**

Sl. No.	Reg. No.	Name of the Candidate	HY010201: History of Social Institutions and Structures of Early India		HY010202: Social Formation of Kerala AD 1200-1800		HY010203: Debates on Medieval India		HY010204: Reflections on Women's History and Gender in Modern India		HY010205: India: The Making of a Colony		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011005049	ALEENA CHARLS	4.60	A+	4.60	A+	4.60	A+	4.60	A+	4.60	A+	
2	190011005050	ANU RAJU	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
3	190011005051	ARCHANA T S	4.00	A	3.60	B	4.00	A	4.00	A	4.00	A	
4	190011005052	ARDRA JAMES	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
5	190011005053	ASHLY SIBY	3.00	B	3.00	B	3.00	B	3.00	B	3.00	B	
6	190011005054	ASWATHY .T .SOMAN	3.60	B+	3.60	B+	3.60	B+	3.60	B+	3.60	B+	
7	190011005055	ASWIN VIJAYAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
8	190011005056	JIJIN M SUNNY	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
9	190011005057	JOPPY JOSE	3.60	B+	3.60	B+	3.60	B+	3.60	B+	3.60	B+	
10	190011005058	LIJOS MATHEW	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
11	190011005059	MARIA JOSE	4.60	A+	4.60	A+	4.60	A+	4.60	A+	4.60	A+	
12	190011005060	MINU V. T	3.20	B	3.20	B	3.20	B	3.20	B	3.20	B	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances were from the students are pending.

MANESH VARGHESE JOHN
Name & Signature of the
TEACHER-IN- CHARGE



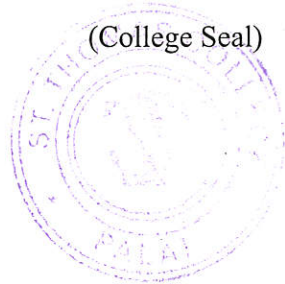
MANESH VARGHESE JOHN
Name & Signature of the
HEAD OF THE DEPARTMENT

DR.JAMES JOHN
Name & Signature of the
PRINCIPAL

Sl. No.	Reg. No.	Name of the Candidate	HY010201: History of Social Institutions and Structures of Early India		HY010202: Social Formation of Kerala AD 1200-1800		HY010203: Debates on Medieval India		HY010204: Reflections on Women's History and Gender in Modern India		HY010205: India: The Making of a Colony		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
13	190011005061	ROSHAN BABU	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
14	190011005062	SUNU GEORGE	3.00	B	3.00	B	3.00	B	3.00	B	3.00	B	
15	190011005063	TOMCY TOM	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
16	190011005064	VISHNU V	4.60	A+	4.60	A+	4.60	A+	4.60	A+	4.60	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission.
 2. These assessments were published and no grievances were from the students are pending.

MANESH VARGHESE JOHN
 Name & Signature of the
 TEACHER-IN- CHARGE



MANESH VARGHESE JOHN
 Name & Signature of the
 HEAD OF THE DEPARTMENT

DR. JAMES JOHN
 Name & Signature of the
 PRINCIPAL



Mahatma Gandhi University

KOTTAYAM - 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M. Com) - CSS (2019 admission)

CENTRE No: 14/E020

PROGRAMME: M. Com Finance

Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	CM010201: Advanced Corporate Accounting		CM010202: Human Resource Management		CM010203: International Business and Finance		CM010204: Quantitative Techniques		CM010205: Strategic Management		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011029202	ANITTA JOSEPH	4.60	A+	5.00	A+	4.80	A+	5.00	A+	5.00	A+	
2	190011029203	ANJALI J	4.80	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
3	190011029204	ANJALY NAIR	4.80	A+	5.00	A+	5.00	A+	4.80	A+	4.80	A+	
4	190011029205	ARATHY BABU	5.00	A+	5.00	A+	5.00	A+	4.80	A+	4.80	A+	
5	190011029206	DEVIKA S	4.80	A+	5.00	A+	4.80	A+	4.80	A+	4.80	A+	
6	190011029207	DIBI SEBASTIAN	-	-	-	-	-	-	-	-	-	-	
7	190011029208	DONA MARIA SEBASTIAN	4.60	A+	5.00	A+	4.80	A+	4.60	A+	4.80	A+	
8	190011029209	KRISHNA C DAMODAR	4.60	A+	5.00	A+	4.80	A+	4.60	A+	5.00	A+	
9	190011029210	MINNU MARIA JOSHY	4.60	A+	5.00	A+	5.00	A+	4.40	A	4.80	A+	
10	190011029211	NANDANA RAJAN	4.60	A+	4.60	A+	4.80	A+	3.80	A	4.40	A	
11	190011029212	NIKHIL THOMAS	4.60	A+	4.60	A+	4.80	A+	4.00	A	4.20	A	
12	190011029213	SANDRA ROSE BENNY	4.60	A+	5.00	A+	5.00	A+	4.80	A+	4.60	A+	
13	190011029214	SHERIN DOMINIC	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
14	190011029215	SNEHA JOSEPH	4.60	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	
15	190011029216	SREELAKSHMI K. R	4.60	A+	4.60	A+	4.80	A+	3.80	A	4.60	A+	
16	190011029217	TEENA VINCENT	4.60	A+	4.60	A+	4.80	A+	3.60	A	4.00	A	
17	190011029218	TERES M SAJI	5.00	A+	4.80	A+	5.00	A+	4.80	A+	4.60	A+	
18	190011029219	VISHNUPRIYA RAJAN	5.00	A+	5.00	A+	5.00	A+	5.00	A+	5.00	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances were from the students are pending.

Jim Mathew
Name & Signature of the
TEACHER-IN-CHARGE



Bobby Simon
Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. James John
Name & Signature of the
PRINCIPAL
St. Thomas College, Palai.



Mahatma Gandhi University

KOTTAYAM – 686 560

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FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: M.Sc. Biostatistics

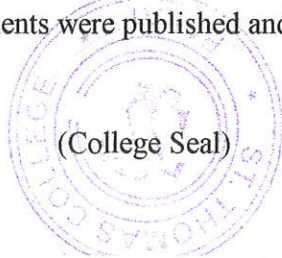
Name of the College: ST.THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	ST 02 0201: Matrix Algebra And Regression Analysis		ST02 0202 Sampling Distributions and Statistical Estimation Methods		ST 02 0203: Parametric And Non - Parametric Tests		ST02 0204 Epidemiology and Study Designs		ST02 0205 Statistical Data Analysis using SPSS, R and Python		Remarks
			Theory		Theory		Theory		Theory		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011008075	AMRUTHA SANKAR	3.87	B	4.00	A	4.02	A	3.50	B	3.57	B	
2	190011008076	ANEENA THANKACHAN	4.22	A	4.60	A+	4.18	A	4.25	A	4.11	A	
3	190011008077	ANEETTA SHAREN FERNANDEZ	3.65	B	4.33	A	3.94	B	3.80	B	3.78	B	
4	190011008078	ANGEL JOSE	4.02	A	4.46	A	4.32	A	4.16	A	3.93	B	
5	190011008079	ANN MARIYA MONCY	4.4	A	4.66	A+	4.16	A	4.08	A	4.03	A	
6	190011008080	ANNA MARIA REJU	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	
7	190011008081	ANUJA R	3.58	B	4.20	A	4.3	A	3.90	B	3.80	B	
8	190011008082	BENSON BENNY	3.58	B	4.33	A	3.76	B	4.05	A	3.68	B	
9	190011008083	BRINIT CHACKO	4.42	A	4.46	A	4.3	A	4.30	A	4.02	A	
10	190011008084	CHINNU BABY	4.02	A	4.46	A	4.1	A	4.04	A	3.75	B	
11	190011008085	DEBIN SUNNY	4.06	A	4.60	A+	4.2	A	4.20	A	4.06	A	
12	190011008086	DONA THOMAS	4.24	A	4.66	A+	4.34	A	4.48	A	4.16	A	
13	190011008087	FAHEEMA T THAHA	3.13	B	4.00	A	3.74	B	3.78	B	3.73	B	
14	190011008088	KRISHNA S NAIR	4.41	A	4.60	A+	3.98	B	3.86	B	4.12	A	
15	190011008089	MALAVIKA B	3.92	B	4.46	A	4	A	4.12	A	3.90	B	
16	190011008090	PANCHAMI ANIL	4.22	A	4.60	A+	4.38	A	4.64	A+	4.04	A	

Certified that: 1. The entries are verified with the records and there is no error or omission
 2. These assessments were published and no grievances were from the students are pending

Aneena. M.S

Name & Signature of the
TEACHER-IN- CHARGE



(College Seal)

for, Meenu Tom Meenu

Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. James John

Name & Signature of the
PRINCIPAL

Sl. No.	Reg. No.	Name of the Candidate	ST 02 0201: Matrix Algebra And Regression Analysis		ST02 0202 Sampling Distributions and Statistical Estimation Methods		ST 02 0203: Parametric And Non - Parametric Tests		ST02 0204 Epidemiology and Study Designs		ST02 0205 Statistical Data Analysis using SPSS, R and Python		Remarks
			Theory		Theory		Theory		Theory		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
17	190011008091	RADHIKA RAJAN	3.48	B	4.46	A	3.94	B	3.84	B	3.77	B	
18	190011008092	RENJU K R	3.66	B	4.20	A	4	A	3.55	B	3.67	B	
19	190011008093	ROOPA THOMAS	4.38	A	4.46	A	4.2	A	4.20	A	3.90	B	
20	190011008094	SHARON MATHEW P R	4.29	A	4.46	A	4.38	A	4.15	A	4.23	A	
21	190011008095	SREELAKSHMI M S	3.92	B	4.46	A	4.12	A	4.05	A	3.89	B	
22	190011008096	SREENUMOL BHASKARAN	3.84	B	4.26	A	4.02	A	3.80	B	3.79	B	

Certified that: 1. The entries are verified with the records and there is no error or omission
2. These assessments were published and no grievances were from the students are pending

Aneena. M.S

Name & Signature of the
TEACHER-IN- CHARGE



for, Meenu Tom
Name & Signature of the
HEAD OF THE DEPARTMENT

Dr. James John
Principal IIC
St. Thomas College, Palai.



Mahatma Gandhi University

KOTTAYAM - 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: M.Sc. Biotechnology

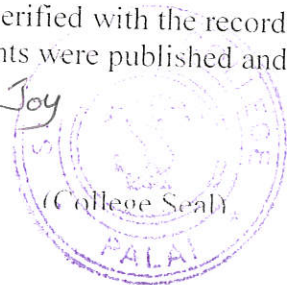
Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	BT020201 Microbiology		BT020202 Immunology		BT020203 Molecular Biology		BT020204 Enzymology and metabolism		BT020205 Laboratory Course - II		Remarks
			Theory		Theory		Theory		Theory		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011011506	AJO JOSE	4.00	A	4.00	A	3.60	B	4.00	A	4.60	A+	
2	190011011507	ASHA. S											
3	190011011508	ASHLY THERESE	4.00	A	3.40	B	3.20	B	4.00	A	4.20	A	
4	190011011509	ATHIRA PADMAKUMAR	3.60	B	3.80	B	3.80	B	3.60	B	4.20	A	
5	190011011510	BINCILY BABY	4.60	A+	4.20	A	4.20	A	4.60	A+	4.60	A+	
6	190011011511	CHRISTIN ALMA BIJU	4.20	A	3.60	B	4.80	A+	3.60	B	4.60	A+	
7	190011011512	DHANYA THOMAS	4.00	A	3.20	B	3.60	B	4.00	A	4.20	A	
8	190011011513	KARTHIKA SURESH	4.20	A	4.00	A	4.20	A	4.20	A	4.60	A+	
9	190011011514	KEERTHY KRISHNAN	3.80	B	3.60	B	3.00	B	3.60	B	4.20	A	
10	190011011515	NAYANA MURALI	4.20	A	3.40	B	4.60	A+	4.00	A	4.60	A+	
11	190011011516	NIMISHA SABU	3.60	B	3.00	B	3.20	B	3.60	B	4.20	A	
12	190011011517	RESHMA MURALI	4.60	A+	4.60	A+	4.60	A+	4.60	A+	4.60	A+	
13	190011011518	SILU SEBASTIAN	3.60	B	3.40	B	3.60	B	4.00	A	4.20	A	
14	190011011519	TOMBIN THOMAS	4.60	A+	4.40	A	4.20	A	4.00	A	4.60	A+	
15	190011011520	VRINDA MOHAN	4.20	A	3.20	B	4.00	A	3.60	B	4.60	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
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Name & Signature of the
TEACHER-IN-CHARGE

Jyothirmol Joy



PROF. JAMES JOSEPH
 HEAD, DEPT. OF BIOTECHNOLOGY
 St. Thomas College
 Palai - 686 574

Dr. James John
 Name & Signature of the
 Principal
 St. Thomas College, Palai.



Mahatma Gandhi University

KOTTAYAM - 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com)-CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: M.Sc. Applied Microbiology

Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	MG010201: Microbial Genetics & Molecular biology		MG010202: Environmental & Agricultural Microbiology		MG010203: Virology		MG010204: Immunology		MG010205: Laboratory Course II		Remarks
			Theory		Theory		Theory		Theory		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011008148	AAZMI SHIHAB	3.80	B	3.60	B	3.00	B	3.20	B	4.20	A	
2	190011008149	AJMIYA SIYAD	4.40	A	4.60	A+	4.20	A	4.00	A	4.20	A	
3	190011008150	ALPHONSA MATHEW	3.40	B	3.20	B	3.40	B	3.60	B	4.60	A+	
4	190011008151	ANGELA GEORGE	4.40	A	3.40	B	3.20	B	3.20	B	4.60	A+	
5	190011008152	ANIL JOHN	3.40	B	4.20	A	3.40	B	3.60	B	4.20	A	
6	190011008153	ANITA TOMY	4.20	A	4.00	A	3.60	B	3.80	B	4.60	A+	
7	190011008154	ANUPAMA K THOMAS	4.00	A	4.20	A	3.80	B	3.40	B	4.60	A+	
8	190011008155	ASTHA S	4.20	A	3.20	B	3.40	B	3.20	B	4.20	A	
9	190011008156	ATHIRA .A	4.00	A	3.20	B	3.40	B	3.40	B	4.60	A+	
10	190011008157	ATHULYA SREEKUMAR	4.00	A	4.60	A+	4.60	A+	4.20	A	4.60	A+	
11	190011008158	DEVIKA M NAIR	4.60	A+	4.20	A	4.00	A	4.20	A	4.20	A	
12	190011008159	GOWRI SANKAR. J	4.60	A+	4.60	A+	4.20	A	4.60	A+	4.60	A+	
13	190011008160	KEERTHI SUDHARSANAN	4.00	A	4.20	A	4.60	A+	3.80	B	4.60	A+	
14	190011008161	KRISHNA PRASAD	4.40	A	4.00	A	4.00	A	3.80	B	4.20	A	
15	190011008162	MEERA KRISHNA	3.80	B	4.00	A	4.20	A	4.20	A	4.20	A	
16	190011008163	NAYANA K NAIR	4.00	A	3.40	B	3.60	B	4.00	A	4.60	A+	

Certified that: 1. The entries are verified with the records and there is no error or omission
 2. These assessments were published and no grievances were from the students are pending

Prin
 Priya Thomas
 Name & Signature of the
 TEACHER-IN-CHARGE



Dr. James Joseph
 Dr. James Joseph
 Name & Signature of the
 HEAD OF THE DEPARTMENT
 ST. THOMAS COLLEGE, PALAI
 Arunapuram

Dr. James John
 Dr. James John
 Name & Signature of the
 PRINCIPAL



Mahatma Gandhi University

KOTTAYAM - 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com)-CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: M.Sc. Applied Microbiology

Name of the College: ST. THOMAS COLLEGE, PALAI

Sl. No.	Reg. No.	Name of the Candidate	MG010201: Microbial Genetics & Molecular biology		MG010202: Environmental & Agricultural Microbiology		MG010203: Virology		MG010204: Immunology		MG010205: Laboratory Course II		Remarks
			Theory		Theory		Theory		Theory		Practical		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
17	190011008164	PARVATHY .S	4.40	A	3.40	B	3.20	B	3.60	B	4.20	A	
18	190011008165	RAJASHREE RAVI	4.00	A	4.00	A	4.00	A	4.20	A	4.60	A+	
19	190011008166	RESNI KHAN	4.40	A	4.60	A+	4.20	A	4.40	A	4.60	A+	
20	190011008167	SINDHYA MINNU. R	4.20	A	4.00	A	3.80	B	4.60	A+	4.60	A+	
21	190011008168	SOPHIA ELIZABETH VARGHESE	4.20	A	3.20	B	3.00	B	3.40	B	4.20	A	
22	190011008169	SREELAKSHMI H.	4.20	A	4.00	A	3.60	B	3.80	B	4.60	A+	
23	190011008170	VARSHA ELIZABETH JOSEPH	3.60	B	4.00	A	3.40	B	3.40	B	4.20	A	

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 2. These assessments were published and no grievances were from the students are pending

Priya Thomas
Name & Signature of the
TEACHER-IN- CHARGE



Name & Signature of the
HEAD OF THE DEPARTMENT
APPLIED MICROBIOLOGY
ST. THOMAS COLLEGE
ATULPATTAN C. O.
PALAI - 686 574.

Dr. James John
Name & Signature of the
PRINCIPAL
St. Thomas College, Palai.

MAHATMA GANDHI UNIVERSITY

INTERNAL ASSESSMENT (Theory) for P.G. PROGRAMME CSS (Effective from 2019 admissions)

Centre No: 14/ E020

College: ST.THOMAS COLLEGE, PALAI

Semester: Second Semester

Programme: M.Sc Biostatistics

Title: ST 02 0201: Matrix Algebra And Regression Analysis

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
381	190011008075	AMRUTHA SANKAR	A	A	B	B	3.87	B	
382	190011008076	ANEENA THANKACHAN	A+	A	A	A	4.22	A	
383	190011008077	ANEETTA SHAREN FERNANDEZ	B	A	B	B	3.65	B	
384	190011008078	ANGEL JOSE	A	A	A	A	4.02	A	
385	190011008079	ANN MARIYA MONCY	A	A+	B	A	4.4	A	
387	190011008081	ANUJA R	A	B	B	A	3.58	B	
388	190011008082	BENSON BENNY	A	B	B	A	3.58	B	
389	190011008083	BRINIT CHACKO	A	A+	B	A	4.42	A	
390	190011008084	CHINNU BABY	A	A	A	A	4.02	A	
391	190011008085	DEBIN SUNNY	A	A	A	A	4.06	A	
393	190011008086	DONA THOMAS	A+	A	A	A	4.24	A	
394	190011008087	FAHEEMA T THAHA	B	B	B	B	3.13	B	
395	190011008088	KRISHNA S NAIR	A	A+	B	A	4.41	A	
396	190011008089	MALAVIKA B	A	A	B	B	3.92	B	

Certified that: 1. The entries are verified with the records and there is no error or omission.

2. These assessments were published and no grievances from the students are pending.

For,

Rose Maria Jose

Name & Signature of the
Head of the DepartmentName & Signature
of the PrincipalName & Signature of the
Teacher(s) in charge

Centre No: 14/ E020

College: ST.THOMAS COLLEGE, PALAI


Semester: Second Semester

Programme: M.Sc Biostatistics


Title: ST 02 0201: Matrix Algebra And Regression Analysis

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Gre	Grade	Weighted Grade Point	Overall Grade	
398	190011008090	PANCHAMI ANIL	A+	A	A	A	4.22	A	
399	190011008091	RADHIKA RAJAN	B	A	B	B	3.48	B	
400	190011008092	RENJU K R	B	A	B	B	3.66	B	
401	190011008093	ROOPA THOMAS	A	A+	B	A	4.38	A	
402	190011008094	SHARON MATHEW P R	A+	A	A	A	4.29	A	
403	190011008095	SREELAKSHMI M S	A	A	B	B	3.92	B	
405	190011008096	SREENUMOL BHASKARAN	A	A	B	B	3.84	B	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Aneena. M-S


Name & Signature of the
Teacher(s) in charge

Fov
Rose Maria Jose

Name & Signature of the
Head of the Department




Name & Signature
of the Principal

MAHATMA GANDHI UNIVERSITY

INTERNAL ASSESSMENT (Theory) for P.G. PROGRAMME CSS (Effective from 2019 admissions)

Centre No: 14/ E020

College: ST.THOMAS COLLEGE, PALAI


Semester: Second Semester

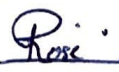
Programme: M.Sc Biostatistics

Title: ST02 0202 Sampling Distributions and Statistical Estimation Methods

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
381	190011008075	AMRUTHA SANKAR	A+	A	B	B	4.00	A	
382	190011008076	ANEENA THANKACHAN	A+	A	A+	A+	4.60	A+	
383	190011008077	ANEETTA SHAREN FERNANDEZ	A+	A	A	A	4.33	A	
384	190011008078	ANGEL JOSE	A+	A	A+	A+	4.46	A	
385	190011008079	ANN MARIYA MONCY	A	A+	A+	A+	4.66	A+	
387	190011008081	ANUJA R	A+	A	A	A	4.20	A	
388	190011008082	BENSON BENNY	A+	A	A	A	4.33	A	
389	190011008083	BRINIT CHACKO	A+	A	A+	A+	4.46	A	
390	190011008084	CHINNU BABY	A+	A	A+	A+	4.46	A	
391	190011008085	DEBIN SUNNY	A+	A	A+	A+	4.60	A+	
393	190011008086	DONA THOMAS	A	A+	A+	A+	4.66	A+	
394	190011008087	FAHEEMA T THAHA	A	A	A	A	4.00	A	
395	190011008088	KRISHNA S NAIR	A+	A	A+	A+	4.60	A+	
396	190011008089	MALAVIKA B	A+	A	A+	A+	4.46	A	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Aneena. M-S

Name & Signature of the
Teacher(s) in charge

Foy
Rose Maria Jose
Name & Signature of the
Head of the Department 




Name & Signature
of the Principal

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
398	190011008090	PANCHAMI ANIL	A+	A	A+	A+	4.60	A+	
399	190011008091	RADHIKA RAJAN	A+	A	A+	A+	4.46	A	
400	190011008092	RENJU K R	A+	A	A	A	4.20	A	
401	190011008093	ROOPA THOMAS	A+	A	A+	A+	4.46	A	
402	190011008094	SHARON MATHEW P R	A+	A	A+	A+	4.46	A	
403	190011008095	SREELAKSHMI M S	A+	A	A+	A+	4.46	A	
405	190011008096	SREENUMOL BHASKARAN	A	A	A+	A+	4.26	A	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Aneena. M-S



Name & Signature of the
Teacher(s) in charge

For

Rose Maria Jose

Name & Signature of the
Head of the Department



Name & Signature
of the Principal

MAHATMA GANDHI UNIVERSITY

INTERNAL ASSESSMENT (Theory) for P.G. PROGRAMME CSS (Effective from 2019 admissions)

Centre No: 14/ E020

College: ST.THOMAS COLLEGE, PALAI

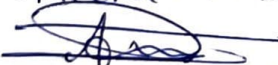
Semester: Second Semester


Programme: M.Sc Biostatistics

Title: ST 02 0203: Parametric And Non - Parametric Tests

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
381	190011008075	AMRUTHA SANKAR	A	A	A	A	4.02	A	
382	190011008076	ANEENA THANKACHAN	A	A	A+	A	4.18	A	
383	190011008077	ANEETTA SHAREN FERNANDEZ	A	A	B	B	3.94	B	
384	190011008078	ANGEL JOSE	A	A	A+	A+	4.32	A	
385	190011008079	ANN MARIYA MONCY	A	A	A	A+	4.16	A	
387	190011008081	ANUJA R	A	A	A+	A+	4.3	A	
388	190011008082	BENSON BENNY	A	A	C	A	3.76	B	
389	190011008083	BRINIT CHACKO	A	A	A+	A+	4.3	A	
390	190011008084	CHINNU BABY	A	A	A	A	4.1	A	
391	190011008085	DEBIN SUNNY	A	A	A+	A+	4.2	A	
393	190011008086	DONA THOMAS	A	A	A+	A+	4.34	A	
394	190011008087	FAHEEMA T THAHA	A	A	B	B	3.74	B	
395	190011008088	KRISHNA S NAIR	A	A	A	B	3.98	B	
396	190011008089	MALAVIKA B	A	A	A	A	4	A	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Aneena - M.S

Name & Signature of the
Teacher(s) in charge

For
Rose Maria Jose
Name & Signature of the 
Head of the Department




Name & Signature
of the Principal

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)		Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
398	190011008090	PANCHAMI ANIL	A	A	A	A+	A+	4.38	A	
399	190011008091	RADHIKA RAJAN	A	A	A	A	B	3.94	B	
400	190011008092	RENJU K R	A	A	A	A	B	4	A	
401	190011008093	ROOPA THOMAS	A	A	A	A+	A	4.2	A	
402	190011008094	SHARON MATHEW P R	A	A	A	A+	A+	4.38	A	
403	190011008095	SREELAKSHMI M S	A	A	A	A	A	4.12	A	
405	190011008096	SREENUMOL BHASKARAN	A	A	A	A+	B	4.02	A	

Certified that: 1. The entries are verified with the records and there is no error or omission.

2. These assessments were published and no grievances from the students are pending.

Aneena M-S

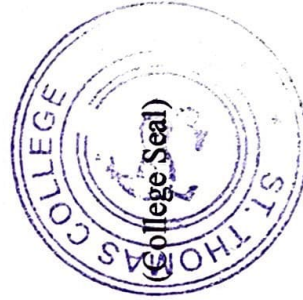


Name & Signature of the
Teacher(s) in charge

For

Rose Maria Jose

Name & Signature of the
Head of the Department




Name & Signature
of the Principal

MAHATMA GANDHI UNIVERSITY

INTERNAL ASSESSMENT (Theory) for P.G. PROGRAMME CSS (Effective from 2019 admissions)

Centre No: 14/ E020

College: ST.THOMAS COLLEGE, PALAI


Semester: Second Semester

Programme: M.Sc Biostatistics

Title: ST02 0204 Epidemiology and Study Designs

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
381	190011008075	AMRUTHA SANKAR	B	A	B	B	3.50	B	
382	190011008076	ANEENA THANKACHAN	A	A+	A	B	4.25	A	
383	190011008077	ANEETTA SHAREN FERNANDEZ	A	A	A	B	3.80	B	
384	190011008078	ANGEL JOSE	A	A	A+	B	4.16	A	
385	190011008079	ANN MARIYA MONCY	A	A	A+	B	4.08	A	
387	190011008081	ANUJA R	B	A	A+	B	3.90	B	
388	190011008082	BENSON BENNY	A	A	A+	B	4.05	A	
389	190011008083	BRINIT CHACKO	B	A+	A+	B	4.30	A	
390	190011008084	CHINNU BABY	A	A	A+	B	4.04	A	
391	190011008085	DEBIN SUNNY	A	A+	B	A	4.20	A	
393	190011008086	DONA THOMAS	A	A+	A+	B	4.48	A	
394	190011008087	FAHEEMA T THAHA	B	A	A	B	3.78	B	
395	190011008088	KRISHNA S NAIR	A	A	B	B	3.86	B	
396	190011008089	MALAVIKA B	A	A	A+	B	4.12	A	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Aneena M.S


Name & Signature of the
Teacher(s) in charge

For

Rose Maria Jose

Name & Signature of the
Head of the Department 



(College Seal)


Name & Signature
of the Principal

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
398	190011008090	PANCHAMI ANIL	A	A+	A+	A	4.64	A+	
399	190011008091	RADHIKA RAJAN	B	A	A	A	3.84	B	
400	190011008092	RENJU K R	B	A	B	B	3.55	B	
401	190011008093	ROOPA THOMAS	A	A	A+	A	4.20	A	
402	190011008094	SHARON MATHEW P R	A	A	A+	B	4.15	A	
403	190011008095	SREELAKSHMI M S	A	A	A+	B	4.05	A	
405	190011008096	SREENUMOL BHASKARAN	B	A	A	A	3.80	B	

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Aneena M.S

Name & Signature of the
Teacher(s) in charge

Foy

Rose Maria Jose

Name & Signature of the
Head of the Department



Name & Signature
of the Principal

MAHATMA GANDHI UNIVERSITYINTERNAL ASSESSMENT (**Theory**) for P.G. PROGRAMME CSS (Effective from 2019 admissions)


Centre No: 14/ E020

College: **ST.THOMAS COLLEGE, PALAI**Semester: **Second Semester**Programme: **M.Sc Biostatistics**Title: **ST02 0205 Statistical Data Analysis using SPSS, R and Python**

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
381	190011008075	AMRUTHA SANKAR	A	A	C	C	3.57	B	
382	190011008076	ANEENA THANKACHAN	A+	A	B	B	4.11	A	
383	190011008077	ANEETTA SHAREN FERNANDEZ	A	A	B	B	3.78	B	
384	190011008078	ANGEL JOSE	A	A	B	B	3.93	B	
385	190011008079	ANN MARIYA MONCY	A+	A	B	B	4.03	A	
387	190011008081	ANUJA R	A	A	B	B	3.80	B	
388	190011008082	BENSON BENNY	A	A	B	B	3.68	B	
389	190011008083	BRINIT CHACKO	A	A	A	A	4.02	A	
390	190011008084	CHINNU BABY	A	A	B	B	3.75	B	
391	190011008085	DEBIN SUNNY	A+	A	B	B	4.06	A	
393	190011008086	DONA THOMAS	A+	A	B	B	4.16	A	
394	190011008087	FAHEEMA T THAHA	A	A	B	B	3.73	B	
395	190011008088	KRISHNA S NAIR	A+	A	B	B	4.12	A	
396	190011008089	MALAVIKA B	A	A	B	B	3.90	B	

Certified that: 1. The entries are verified with the records and there is no error or omission.
2. These assessments were published and no grievances from the students are pending.

Aneena. M.S


Name & Signature of the
Teacher(s) in charge

For

Rose Maria Jose


Name & Signature of the
Head of the Department


(College Seal)


Name & Signature
of the Principal

Class No.	Reg. No.	Name of Candidate	Assignment (Wt.1)	Seminar (Wt. 2)	Test Paper 1 (Wt.1)	Test Paper 2 (Wt.1)	Consolidated		Remarks
			Grade	Grade	Grade	Grade	Weighted Grade Point	Overall Grade	
398	190011008090	PANCHAMI ANIL	A	A	A	A	4.04	A	
399	190011008091	RADHIKA RAJAN	A	A	B	B	3.77	B	
400	190011008092	RENJU K R	A	A	B	B	3.67	B	
401	190011008093	ROOPA THOMAS	A	A	B	B	3.90	B	
402	190011008094	SHARON MATHEW P R	A+	A	A	A	4.23	A	
403	190011008095	SREELAKSHMI M S	A	A	B	B	3.89	B	
405	190011008096	SREENUMOL BHASKARAN	A	A	B	B	3.79	B	

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Aneena. M.S

For

Rose Maria Jose

Name & Signature of the
Teacher(s) in charge

Name & Signature of the
Head of the Department



Name & Signature
of the Principal

Mahatma Gandhi University

KOTTAYAM – 686 560

(Established by Kerala State Legislature by Notification No. 3431/Leg. C1/85/Law dated 17th April 1985)

FORM B - SECOND SEMESTER INTERNAL EVALUATION FOR P.G. PROGRAMME (M.A./M.Sc./M.Com) - CSS (2019 admission)

CENTRE No: 14/ E020

PROGRAMME: M.Sc. Biostatistics

Name of the College: **ST. THOMAS COLLEGE, PALAI**

SL No.	Reg. No.	Name of the Candidate	ST 02 0201: Matrix Algebra And Regression Analysis		ST02 0202 Sampling Distributions and Statistical Estimation Methods		ST 02 0203: Parametric And Non - Parametric Tests		ST02 0204 Epidemiology and Study Designs		ST02 0205 Statistical Data Analysis using SPSS, R and Python		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
1	190011008075	AMRUTHA SANKAR	3.87	B	4.00	A	4.02	A	3.50	B	3.57	B	
2	190011008076	ANEENA THANKACHAN	4.22	A	4.60	A+	4.18	A	4.25	A	4.11	A	
3	190011008077	ANEETTA SHAREN FERNANDEZ	3.65	B	4.33	A	3.94	B	3.80	B	3.78	B	
4	190011008078	ANGEL JOSE	4.02	A	4.46	A	4.32	A	4.16	A	3.93	B	
5	190011008079	ANN MARIYA MONCY	4.4	A	4.66	A+	4.16	A	4.08	A	4.03	A	
6	190011008080	ANNA MARIA REJU	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	
7	190011008081	ANUJA R	3.58	B	4.20	A	4.3	A	3.90	B	3.80	B	
8	190011008082	BENSON BENNY	3.58	B	4.33	A	3.76	B	4.05	A	3.68	B	
9	190011008083	BRINIT CHACKO	4.42	A	4.46	A	4.3	A	4.30	A	4.02	A	
10	190011008084	CHINNU BABY	4.02	A	4.46	A	4.1	A	4.04	A	3.75	B	
11	190011008085	DEBIN SUNNY	4.06	A	4.60	A+	4.2	A	4.20	A	4.06	A	
12	190011008086	DONA THOMAS	4.24	A	4.66	A+	4.34	A	4.48	A	4.16	A	
13	190011008087	FAHEEMA T THAHA	3.13	B	4.00	A	3.74	B	3.78	B	3.73	B	
14	190011008088	KRISHNA S NAIR	4.41	A	4.60	A+	3.98	B	3.86	B	4.12	A	
15	190011008089	MALAVIKA B	3.92	B	4.46	A	4	A	4.12	A	3.90	B	
16	190011008090	PANCHAMI ANIL	4.22	A	4.60	A+	4.38	A	4.64	A+	4.04	A	

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2. These assessments were published and no grievances were from the students are pending

Name & Signature of the
TEACHER-IN- CHARGE



for, Maenu Tom Maenu
Name & Signature of the
HEAD OF THE DEPARTMENT

Name & Signature of the
PRINCIPAL
Principal I/O
St. Thomas College, Pala.

Sl. No.	Reg. No.	Name of the Candidate	ST 02 0201: Matrix Algebra And Regression Analysis		ST02 0202 Sampling Distributions and Statistical Estimation Methods		ST 02 0203: Parametric And Non - Parametric Tests		ST02 0204 Epidemiology and Study Designs		ST02 0205 Statistical Data Analysis using SPSS, R and Python		Remarks
			Theory		Theory		Theory		Theory		Theory		
			GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	GPA	Grade	
17	190011008091	RADHIKA RAJAN	3.48	B	4.46	A	3.94	B	3.84	B	3.77	B	
18	190011008092	RENJU K R	3.66	B	4.20	A	4	A	3.55	B	3.67	B	
19	190011008093	ROOPA THOMAS	4.38	A	4.46	A	4.2	A	4.20	A	3.90	B	
20	190011008094	SHARON MATHEW P R	4.29	A	4.46	A	4.38	A	4.15	A	4.23	A	
21	190011008095	SREELAKSHMI M S	3.92	B	4.46	A	4.12	A	4.05	A	3.89	B	
22	190011008096	SREENUMOL BHASKARAN	3.84	B	4.26	A	4.02	A	3.80	B	3.79	B	

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Aneena. M-S



Name & Signature of the
TEACHER-IN- CHARGE



for, ^{Meenu} Meenu Tom

Name & Signature of the
HEAD OF THE DEPARTMENT



Name & Signature of the
PRINCIPAL
St. Thomas College, Pala.