

# ATTENDANCE REGISTER

20 - 2015 ONWARDS



REMEDIAL TEACHING

DEPARTMENT OF PHYSICS

TEACHER-IN-CHARGE : RESANI V. KOSHY

**ASHOK PRESS**

Market Junction

**KOTTARAKARA**

Phone : 0474-2452144, 2451723



RESANI V. KOSHY  
TEACHER IN CHARGE  
ST. GREGORIOS COLLEGE  
KOTTARAKARA

FIFTH SEMESTER [2013 Admission]

ATTENDANCE REGISTER

PY1542 : QUANTUM MECHANICS

Number	NAMES	No. of days casual leave already availed	Mat. Date							8	9	10
			30/10/2015	31/10/2015	2/11/2015	9/11/2015	14/11/2015	5/11/2015	7/11/2015			
1.	ADARSHMON G.		X	X	X	X	a	X	X			
2.	HARIKRISHNAN V.V.		X	a	X	a	a	X	a			
3.	HARIKRISHNAN T.S.		X	X	X	a	X	X	X			
4.	NIMA S.		X	X	X	X	X	X	X			
5.	VEENA V.		X	X	X	X	X	X	a			
6.	MITHU R. MURALI		X	X	X	X	X	X	X			
Initial of the teacher-in-charge			P	P	P	P	P	P	P			

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Dr. SUMAN ALEXANDER  
PRINCIPAL  
ST. GREGORIOS COLLEGE  
KOTTARAKARA



SIXTH SEMESTER (2013 Admission)  
ATTENDANCE REGISTER

PY1642 - NUCLEAR AND PARTICLE PHYSICS

Number	NAMES	No. of days casual leave already availed	Date							8	9	10
			19/03/2016	20/03/2016	22/03/2016	23/03/2016	24/03/2016	25/03/2016	26/03/2016			
1.	ADARSHMON G.		X	X	X	X	X	a	X			
2.	ANANDHU SURESH		a	X	X	X	a	X	X			
3.	HARIKRISHNAN V.V.		a	X	X	a	a	a	X			
4.	HARIKRISHNAN J.S.		X	a	X	X	X	a	X			
5.	JERIN T. JOY		X	X	X	a	X	X	a			
6.	NIMA S.		X	X	a	X	X	X	X			
7.	ROJIN RATU		X	X	X	a	X	a	X			
Initial of the tx-in-charge			<i>Ro</i>	<i>Ro</i>	<i>Ro</i>	<i>Ro</i>	<i>Ro</i>	<i>Ro</i>	<i>Ro</i>			



*Suman Alexander*  
Dr. SUMAN ALEXANDER  
PRINCIPAL  
ST. GREGORIOS COLLEGE  
KOTTARAKKUDA

# FIRST SEMESTER (2019 Admissions)

## ATTENDANCE REGISTER

### PY 1141: BASIC MECHANICS & PROPERTIES OF MATTER

Number	NAMES	No. of days casual leave already availed	Eng. Date						7	8	9	10
			6/11/2019	6/11/2019	8/11/2019	9/11/2019	12/11/2019	15/11/2019				
1.	BINOY B.		X	X	a	X	X	X				
2.	RAHUL RAJ R.		X	a	a	X	X	X				
3.	ALAN S. JEEVA		X	X	X	X	a	X				
4.	ANU M.S.		X	X	X	X	X	X				
5.	ARYA A.		X	X	X	X	X	X				
6.	ASHIK A. KHARIM		X	X	a	a	X	X				
7.	SWATHI SANTHOSH		X	X	X	X	X	X				
8.	NAHAS N.		X	a	a	a	X	a				
	Initial of the ta-in-charge		Res	Res	Res	Res	Res	Res				



*J.P. Reddy*  
*S. A. A.*  
 Dr. SUMAN ALEXANDER  
 PRINCIPAL  
 ST. GREGORIOS COLLEGE  
 KOTTARAKKUDA



SECOND SEMESTER (2019 Admissions)

ATTENDANCE REGISTER

PY 1241: HEAT AND THERMODYNAMICS

Number	NAMES	No. of days casual leave already availed	Date							8	9	10		
			Eng. Date	Mat. Date	23/11/2020	25/11/2020	28/11/2020	1/12/2020	2/12/2020				4/12/2020	5/12/2020
1.	RAHUL R A T R.				X	X	a	a	X	X	X			
2.	ANU M.S.				X	X	X	X	a	X	X			
3.	ARYA A.				X	X	a	X	X	X	X			
4.	R. AMAL R A T				X	X	X	X	X	a	X			
Initial of the in-charge					<i>RA</i>	<i>RA</i>	<i>RA</i>	<i>RA</i>	<i>RA</i>	<i>RA</i>	<i>RA</i>			



Dr. SIMAN ALEXANDER  
PRINCIPAL  
ST. GREGORIOS COLLEGE

# REMEDIAL TEACHING



A handwritten signature in blue ink, appearing to read "Suman Alexander", written over a horizontal line.

Dr. SUMAN ALEXANDER  
PRINCIPAL  
ST. GREGORIOS COLLEGE  
KOTTARAKARA

## REMEDIAL TEACHING

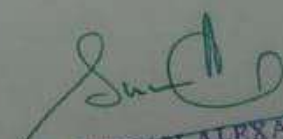
Remedial teaching is to ensure the desired quality of learning. It is very essential for ensuring effective learning and in improving the quality of education. It is a type of teaching aimed at correcting errors or addressing gaps in knowledge. Students who have temporarily fallen behind in their studies or otherwise need short-term support in their learning have the right to get remedial teaching. They should be given necessary guidance to help them overcome their problems, after identifying their areas of difficulty. Remedial measures taken by the teachers include: Re-teaching of the topic, Computer-aided teaching, Drilling of problems, Personal and individual attention by the remedial teacher.

The essential steps in educational diagnosis are:

- i) Identifying the students who are having trouble or need help.
- ii) Locating the errors or learning difficulties.
- iii) Discovering the causal factors of slow learning.

Our department provides great emphasis in conducting remedial teaching sessions regularly and systematically every academic year semester wise. Even with the tight academic schedules, time slots are arranged for remedial sessions effectively. After the termination of internal exams during each semester, the internal papers are valued and the marks are tabulated. With the help of the mark list, students who have scored marks below 40% are identified for remedial teaching. By scrutinizing the internal answer sheets, the areas of difficulty are recognized. In addition to this, other areas of the syllabus that requires re-teaching are also selected with the help of a mere discussion with the identified students. Based on these steps, a syllabus for remedial teaching session is prepared. Students are given re-teaching sessions based on the syllabus with utmost individual attention. After remedial teaching at extra hours, another follow-up test is conducted to ensure benefit from this type of remediation. It is expected that the remedial teaching programme will help students to overcome their learning difficulties so that they may gain a sense of achievement and recover their confidence and interest in learning.



  
Dr. SUMAN ALEXANDER  
P. T. 10/10/11  
ST. GREGORIOS COLLEGE  
KOTTARAKKUDA

**SIXTH SEMESTER B.Sc PHYSICS**  
**PY1642- NUCLEAR AND PARTICLE PHYSICS**  
**(2013 – 2016) BATCH**



  
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ST. GREGORIOS COLLEGE, KOTTARAKARA  
SIXTH SEMESTER B.Sc DEGREE PROGRAMME (CBCSS)  
INTERNAL EXAMINATION, MARCH 2016  
PY 1642 – NUCLEAR AND PARTICLE PHYSICS

Time: 3hrs

Max.Marks: 80

PART A

(Answer all questions in one or two sentences. Each question carries 1 mark)

1. Define radioactivity.
2. What are Cerenkov radiations?
3. Find out the hypercharge of neutron.
4. Name any two units of radioactivity.
5. What is 'strange' about strange particles?
6. Why are neutrons moderated to thermal speeds in nuclear reactors?
7. Which is the parent element in the Neptunium series?
8. What are magic numbers?
9. Explain the conditions for chain reaction in terms of multiplication factor.
10. Write down the relation between half- life period and mean life period.

(10 X 1 = 10 marks)

PART B

(Answer any eight questions. Each question carries 2 marks)

11. Sketch a plot of binding energy curve and explain it.
12. Explain the basic idea of quark model. Sketch the quark model of antineutron.
13. On the basis of liquid drop model, account for the fission of a nucleus.
14. Explain the carbon-nitrogen cycle.
15. What do you mean by bremsstrahlung and mention one of its application?
16. Briefly explain the working of a scintillation counter.
17. Explain nuclear quadrupole moment.
18. Explain why confinement is a big problem in the case of fusion reactors?
19. Write a note on radioactive series.
20. Explain transient equilibrium.
21. Explain briefly the different types of radioactive decay.
22. State the law of radioactive disintegration and obtain the expression showing that the number of radioactive atoms decreases exponentially with time.

(8 X 2 = 16 marks)

PART C

(Answer any six questions. Each question carries 4 marks)

23. The radius of  $\text{Ho}^{165}$  is 7.731 Fermi. Deduce the radius of  $\text{He}^4$ .
24. Deuterons in a cyclotron describe a circle of radius 0.45m, just before emerging from the dees. The frequency of the applied field is 10 MHz. Find the flux density of the magnetic field and the velocity of deuterons emerging out of the cyclotron. Mass of deuterium =  $3.32 \times 10^{-27}$  Kg,  $e = 1.6 \times 10^{-19}$  C.



*J.P. Padayach*

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25. Check whether the following reactions are allowed or forbidden under the conservation of charge, baryon number, strangeness and components of isotopic spin.
- (a)  $\pi^+ + n \rightarrow \pi^- + p$       (b)  $\pi^+ + p \rightarrow \epsilon^+ + K^+$
26. Calculate the binding energy per nucleon for the  ${}_{28}\text{Ni}^{64}$  nucleus, whose mass is 63.9279 amu. Mass of proton = 1.00727u and mass of neutron = 1.00866u.
27. How many kilowatt energy will be released by complete fission of 1gm of Uranium-235, if the energy released per fission is 200 MeV.
28. How many  $\alpha$  and  $\beta$  particles are emitted when  ${}_{90}\text{Th}^{232}$  changes into  ${}_{82}\text{Pb}^{208}$ .
29. The half-life period of a radioactive element is 2.5 days. What is the value of decay constant  $\lambda$ ?
30. The disintegration constant of a radioactive element is  $2.31 \times 10^{-3}$  per day. Calculate its half-life and average life.
31. 1 gm of radium is reduced by 2.1mg in 5 years by  $\alpha$ -decay. Calculate the half life of Radium.

(6 X 4 = 24 marks)

#### PART D

(Answer any **two** questions. Each question carries 15 marks)

32. Explain the issues related to nuclear power in India.
33. Distinguish between primary and secondary cosmic rays. Explain the effects associated with it. Also account for the origin of cosmic rays.
34. Explain the classification of elementary particles. Explain the various quantum numbers associated with it.
35. (a) What is meant by half-life period of a radioactive substance? Derive the expression for the half-life period and mention its significance.
- (b) Define the mean life period of a radioactive substance and derive an expression for it.

(2 X 15 = 30 marks)



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 PRINCIPAL  
 ST. GREGORIOS COLLEGE  
 KOTTARAKKARA



# ST. GREGORIOS COLLEGE, KOTTARAKARA

FIRST DEGREE PROGRAMME UNDER CBCSS

Test Paper for Continuous Evaluation ..... 20.....

Name of Student: Hari Krishnan. J.S Class No. 21

Major Subject: Bsc Physics Semester: VI

Course Code: \_\_\_\_\_ Course Name: Nuclear and particle physics

I. Very Short Answer (10 out of 10) [1 x 10 = 10 marks]		II. Short Answer (8 out of 12) [2 x 8 = 16 marks]		III. Short Essay (6 out of 9) [4 x 6 = 24 marks]		IV. Long Essay (2 out of 4) [16 x 2 = 30 marks]	
Qn. No.	Marks	Qn. No.	Marks	Qn. No.	Marks	Qn. No.	Marks
1	1	11	2	28	1	32	
2	0	12		29	2	33	
3		13		30		34	
4	1	14		31		35	
5	1	15					
6	0	16		28	4		
7	0	17	1	29	4		
8	1	18		30			
9		19		31	2		
10	1	20					
		21	14				
		22	2				
Total	5	Total	6/2	Total	19/13	Total	

A. Total Marks out of 80 = 25

B. Total Marks out of 10 ( $B = A / 8$ ) = 3.13

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CA Mark- Course Wise ( Finallist )

Examcod : 23013601

Scheme : 2013

Semester : 6

B Sc Physics ( 230 )

St. Gregorios College, Kottarakara, Kollam (126 )

Sl No.	Candidate Code	Name of the Student	01	02	03	04	05	06	07	Signatur
1	13126002	ANISHA T VARGHESE	14.25	16.50	15.88	17.63	17.00(0555)	20.00	20.00	<i>Anisha</i>
2	13126003	DENCY V PANICKER	17.75	18.13	19.38	19.00	19.13(0555)	20.00	20.00	<i>Dency</i>
3	13126004	JISHNU KUMAR V S	15.25	17.38	17.00	12.50	17.88(0555)	20.00	19.00	<i>Jishnu</i>
4	13126005	JULIE JOHN	17.00	17.50	18.75	17.00	18.38(0555)	20.00	19.00	<i>Julie</i>
5	13126006	LEKSHMI R	17.63	18.00	18.75	17.00	18.50(0555)	20.00	19.00	<i>Lekshmi</i>
6	13126007	MALAVI KRISHNAN	16.63	16.380	17.38	17.00	18.13(0555)	18.00	17.00	<i>Malavikrishnan</i>
7	13126008	MALAVIKA L R	18.88	19.25	19.38	19.00	18.75(0555)	20.00	20.00	<i>Mal</i>
8	13126009	NAIR PRIYANKA JAYAPRAKASH	19.25	18.25	19.69	18.63	19.00(0555)	20.00	20.00	<i>Priyanka</i>
9	13126010	PARVATHY B S	18.88	18.50	19.63	19.00	18.25(0555)	20.00	20.00	<i>Parvathy</i>
10	13126011	PRANAVYA MOHAN	19.38	18.63	19.75	18.88	19.69(0555)	20.00	20.00	<i>Pranavya</i>
11	13126012	ADARSHMON G	8.00	8.00	8.00	6.25	10.75(0555)	16.00	16.00	<i>Adarsh</i>
12	13126013	AKHILA S	14.00	15.25	16.380	14.75	17.00(0555)	18.00	19.00	<i>Akhila</i>
13	13126015	ALEESHA C S	17.88	18.75	19.00	18.50	17.75(0555)	20.00	20.00	<i>Aleesha cs</i>
14	13126016	ANAGHA. R. S	18.63	18.38	19.00	18.25	18.38(0555)	20.00	20.00	<i>Ana</i>
15	13126017	ANANDHU SURESH	6.00	1.00	9.25	4.25	8.63(0555)	16.00	16.00	<i>Anandhu</i>
16	13126019	ARYA KRISHNAN	14.25	16.130	16.75	16.380	18.00(0555)	18.00	17.00	<i>Arya</i>
17	13126021	DEVIKA D S	15.38	18.63	18.25	16.25	17.75(0555)	19.00	20.00	<i>Devika</i>
18	13126022	DEVIKA MINI NAIR	17.25	18.13	19.38	17.50	18.00(0555)	20.00	20.00	<i>Devika</i>
19	13126023	HARIKRISHNAN V V	10.75	4.00	9.63	4.25	11.00(0555)	16.00	16.00	<i>Hari</i>

*Tr-in-charge*

*Suman*  
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 KOTTARAKARA



20	13126024	HARIKRISHNAN, J.S	10.44	12.13	13.75	14.00	15.00(0555)	18.00	19.00	
21	13126025	JERIN T JOY	11.00	8.00	13.25	8.25	12.25(0555)	18.00	17.00	
22	13126026	JISHA PHILIP	17.38	17.88	18.63	18.63	17.88(0555)	19.00	20.00	
23	13126027	KRISHNAPRIYA V S	13.75	17.38	16.380	16.75	17.25(0555)	20.00	19.00	
24	13126028	NIMA S	14.13	12.75	12.63	16.00	16.25(0555)	18.00	19.00	
25	13126029	NIMMY JOSE	16.63	17.25	18.13	18.50	18.50(0555)	18.00	19.00	
26	13126030	SEBINA K SAMACHAN	16.380	17.75	19.50	17.63	18.44(0555)	20.00	19.00	
27	13126032	SUSAN G PANICKER	16.25	16.25	17.88	16.25	16.060(0555)	19.00	18.00	
28	13126033	VEENA V	14.69	15.88	15.75	16.50	18.13(0555)	17.00	18.00	
29	13126035	ARYA S KUMAR	17.75	17.63	19.63	17.75	18.75(0555)	20.00	18.00	
30	13126036	JESLIN JAMES	17.94	17.50	17.50	17.63	18.00(0555)	20.00	20.00	
31	13126037	MITHU R MURALI	13.75	14.62	15.63	15.75	17.13(0555)	19.00	18.00	
32	13126038	ROJIN RAJU	10.50	9.25	12.00	8.25	8.00(0555)	17.00	16.00	

Code Name of the Subject

- 01 Solid State Physics ( PY 1641 )
- 02 Nuclear & Particle Physics ( PY 1642 )
- 03 Classical & Modern Optics ( PY 1643 )
- 04 Computer Science ( PY 1644 )
- 0555 Space Science ( PY 1661.2 )
- 06 Optics, Electricity and Magnetism (Practical) ( PY 1645 )
- 07 Electronics and Computer Science (Practical) ( PY 1646 )
- 08 Project ( PY 1647 )

In-charge

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KOTTARAKARA



SIXTH SEMESTER B.Sc PHYSICS (2013 ADMISSIONS)  
PY1642- NUCLEAR AND PARTICLE PHYSICS

LIST OF STUDENTS SELECTED FOR REMEDIAL TEACHING

Sl. No.	Candidate Code	Name of the student
1.	23013126012	ADARSHMON G.
2.	23013126017	ANANDHU SURESH
3.	23013126023	HARIKRISHNAN V.V.
4.	23013126024	HARIKRISHNAN J.S.
5.	23013126025	JERIN T. JOY
6.	23013126028	NIMA S.
7.	23013126038	ROJIN RAJU

TOPICS SELECTED FOR REMEDIAL TEACHING

- **Unit 1: INTRODUCTION TO THE NUCLEUS**  
Magnetic moment-nuclear quadrupole moment, Liquid drop model
- **Unit 2: RADIOACTIVITY**  
Decay series-radioactive equilibrium-secular and transient equilibrium, Gamow's theory
- **Unit 3: NUCLEAR FORCES**  
Meson theory of nuclear forces
- **Unit 4: NUCLEAR RADIATION DETECTORS AND PARTICLE ACCELERATORS**  
G.M Counter
- **Unit 5: NUCLEAR REACTIONS**  
The Q value equation for a nuclear reaction, scattering cross section, compound nucleus.
- **Unit 6: NUCLEAR FISSION AND FUSION**  
Bohr and Wheeler's theory, Thermonuclear reactions.
- **Unit 7: COSMIC RAYS AND ELEMENTARY PARTICLES**  
Classification of elementary particles, Conservation laws, Quark model

*J.P. Padayon*

*Dr. Suman Alexander*

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**ST.GREGORIOS COLLEGE, KOTTARAKARA**  
**SIXTH SEMESTER B.Sc DEGREE PROGRAMME (CBCSS)**  
**TEST PAPER, MARCH 2016**  
**PY1642- NUCLEAR AND PARTICLE PHYSICS**

Time: 1.5 hrs

Max. Marks: 40

**PART A**

(Answer **all** questions in one or two sentences. Each question carries **1** mark)

1. What is compound nucleus?
2. Draw the voltage characteristics of GM counter.
3. What are thermonuclear reactions?
4. Which is the parent element in Neptunium series?
5. Define Q-value of a nuclear reaction.

(5 X 1 = 5 marks)

**PART B**

(Answer any **all** questions. Each question carries **2** marks)

6. Explain nuclear quadrupole moment.
7. Sketch the quark model of neutron.
8. What do you mean by the Meson theory of nuclear forces?
9. State some merits and demerits of Liquid drop model.

(4 X 2 = 8 marks)

**PART C**

(Answer **all** questions. Each question carries **4** marks)

10. With the help of conservation laws, check whether the following reaction is allowed or not:  
 $\pi^+ + n \rightarrow \pi^0 + K^+$
11. A radioactive series begins with an isotope of Uranium with  $Z=92$  and  $A=238$ . Calculate the value of  $A$  and  $Z$  after the emission of 8 alpha particles and 6 beta electrons.
12. Explain the conservation laws associated with nuclear reactions.

(3 X 4 = 12 marks)

**PART D**

(Answer the given question. The question carries **15** marks)

13. Write an essay on Elementary particles and their interactions.

(1 X 15 = 15 marks)

*J.P. Radhyar*



*Suman Alexander*  
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21/2  
40

Harikrishnan J-S  
Roll no: 21  
Sri college, KTR.

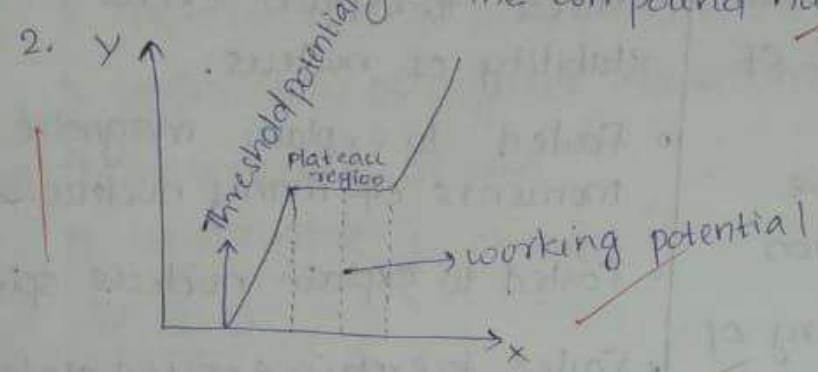
SIXTH SEMESTER BSC DEGREE PROGRAMME (CBCSS)

TEST PAPER, NOVEMBER 2015

PY1642 - NUCLEAR AND PARTICLE PHYSICS.

PART - A

1. Incident particle strongly interacts with the target nucleus to get the compound nucleus.



3. Reactions at very high temperatures are called Thermonuclear reactions.

0 4.  $\alpha$

5. Total energy evolved or absorbed ( $Q$ ).

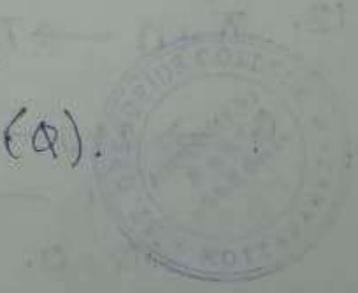
PART B

6. Nuclear quadrupole moment says that nuclei are either elongated or compressed, and it is in the direction of axis of spin angular momentum.

0 7.  $\times$

- 8. • Nucleon is surrounded by particles having appreciable rest mass
- Nucleon emits and absorbs  $\pi$ -meson.

Two nucleons are close and meson fields overlap,



DR. S. MANI ALEXANDER  
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A. P. Padayath

SIXTH SEMESTER B.Sc DEGREE PROGRAMME (CBCSS)  
PY1642- NUCLEAR AND PARTICLE PHYSICS

MARK LIST- TEST PAPER, MARCH 2016

Sl. No.	Candidate Code	Name of the student	Marks (Out of 40)
1.	23013126012	ADARSHMON G.	23.5
2.	23013126017	ANANDHU SURESH	25
3.	23013126023	HARIKRISHNAN V.V.	21
4.	23013126024	HARIKRISHNAN J.S.	21.5
5.	23013126025	JERIN T. JOY	26
6.	23013126028	NIMA S.	32
7.	23013126038	ROJIN RAJU	30.5

*J.P. Padiyara*

*Suman*

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*Pejlkary*  
Tr-in-charge

