



**TRAINING MODULES  
FOR GROUP B OFFICERS  
& GROUP C SUPERVISORS  
OF S&T DEPARTMENT**

**Indian Railways Institute of  
Signal Engineering &  
Telecommunications/Secunderabad**

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# **SIGNALLING COURSES**

**COURSES FOR Gr B OFFICERS**  
**(Telecom to Signal)**

## 1.0 INTEGRATION COURSE FOR GR B OFFICERS (TELE TO SIG)

Nature of Training	Training at	Duration
INSTITUTIONAL TRAINING	IRISET	PHASE I: 03 WEEKS
		PHASE II: 03 WEEKS
TOTAL		06 WEEKS

### 1.1 OVERVIEW OF PHASE-I - IBSS/01

#### A. Course Program: 03 Weeks

Sl.No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	49
3	THEORY EXAMINATION	09
4	PRACTICALS	27
5	PRACTICAL EXAMINATION	0
6	MISCELLANEOUS (Local Visit)	02
7	CD SPARE	0
<b>Total</b>		<b>90 Hrs</b>

#### B: Theory

Sl.No.	Code	Subject	Hours	Marks
1	S1	Basics of Signal Engineering	05	30
2	S2	Principles of Interlocking, Selection Circuits and Control Tables	04	0
3	S10	Colour Light and Automatic Signalling	02	0
4	S12	Relay Interlocking - Metal to Carbon Relays (British)	06	100
5	S13	Circuit Practices - British	04	
6	S18	Electronic Interlocking	08	45
7	S19	Signalling Relays and Cables	02	25
8	S20	Lever lock, Circuit controllers, Electrical Key Transmitter, Principles of slotting & Electric Lifting Barriers	02	0
9	S21	Electric Point Machine	04	25
10	S22	SGE Double Line Block Instrument	04	25
11	S23	Token less Block Instrument for Single Line	04	25
12	S25	Train Detection Systems-I (DC Track Circuits, Coded AFTC and SSDAC)	04	25
<b>Total</b>			<b>49</b>	<b>300</b>

**C: Theory Examinations**

Exam	Subjects	Hours	Marks
<b>Exam-I</b>	S1, S18, S25	03	100
<b>Exam-II</b>	S19, S21, S22 & S23	03	100
<b>Exam-III</b>	S12, S13	03	100
<b>Total</b>		<b>09</b>	<b>300</b>

**D: Practical**

Sl.No.	Lab	Hours	Marks
<b>1</b>	Outdoor Signalling Lab	06	--
<b>2</b>	Electrical Signalling Lab	10	--
<b>3</b>	Block Signalling Lab	07	--
<b>4</b>	Train Detection Lab	04	--
<b>Total</b>		<b>27</b>	

**E. Miscellaneous**

Sl. No	Details	Hours
<b>1</b>	Local Visit	02
<b>Total</b>		<b>02</b>

## 1.2 OVERVIEW OF PHASE-II – IBSS/02

### A. Course Program: 03 Weeks

Sl.No	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	55
3	THEORY EXAMINATION	04
4	PRACTICALS	18
5	PROJECTS PRESENTATION	02
6	MISCELLANEOUS [Study Tour (Optional) & Extension Lectures]	06
7	CD SPARE	02
<b>Total</b>		<b>90 Hrs</b>

### B. Theory

Sl.No.	Code	Subject	Hours	Marks
1	S7	Signalling in 25KV AC Electrified Section	04	20
2	S8	Signalling General	04	20
3	S9	Power Supply for Signalling	04	15
4	S11	Datalogger	04	15
5	S16	RRI Siemens	06	35
6	S18A	Electronic Interlocking Design	13	35
7	S24	Intermediate Block Signalling, Block Proving Axle Counters and UFSBI	04	30
8	S26	Train Detection Systems-II (MSDAC)	04	15
9	S28	TPWS, AWS, ETCS and CTC/TMS	04	15
10	S28A	KAVACH: Indian Railway Automatic Train Protection	04	0
11	S29	Railway Signalling –Installation and Quality Practices	02	0
12	G8	Quality & Reliability Standards	02	0
<b>Total</b>			<b>55</b>	<b>200</b>

### C. Theory Examinations

Exam	Subjects	Hours	Marks
<b>Exam-I</b>	S7, S9, S16, S24	02	100
<b>Exam-II</b>	S8, S18A, S11, S26, S28	02	100
<b>Total</b>		<b>04</b>	<b>200</b>

**D. Practical**

Sl.No.	Name of Lab	Hours
1.	Electrical Signalling Lab	06
2.	Block Lab	05
3.	Train Detection Lab	07
<b>Total</b>		<b>18</b>

**E. Miscellaneous**

Sl. No	Details	Hours
1	Project Presentation	02
2	Extension Lecturers (OHE, P-Way and C & W)	06
<b>Total</b>		<b>08</b>

**F. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	02



**COURSES FOR JE/SSE  
(SIGNAL)**

**2.0 INITIAL COURSE FOR APP.JE (SIGNAL)**

Nature of Training	Training at	Duration	Marks
INSTITUTIONAL TRAINING	IRISET	PHASE I: 14 WEEKS	2000
		PHASE II: 14 WEEKS	
		(Sub-Total): 28 weeks	
FIELD TRAINING	ZONAL RAILWAYS	24 WEEKS	1000
<b>TOTAL</b>		<b>52 WEEKS</b>	<b>3000</b>

**2.1 OVERVIEW OF PHASE-I – ISJE/01**

**A. Course Program: 14 Weeks**

Sl.No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	239
3	THEORY EXAMINATION	15
4	PRACTICALS	127
5	PRACTICAL EXAMINATION	16
6	MISCELLANEOUS (Project Allotment)	04
7	CD SPARE	16
<b>Total</b>		<b>420 Hrs</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	15	500
2	PRACTICAL	16	400
3	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
4	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>1000</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	G1	Personality Development	09	-
2	S1	Basics of Signal Engineering	22	50
3	S2	Principles of Interlocking , Selection Circuits and Control Tables	21	50
4	S3	Mechanical Signalling- Single Wire & Rodding	04	0
5	S10	Colour Light and Automatic Signalling	16	25
6	S12	Relay Interlocking - Metal to Carbon Relays (British)	30	50
7	S13	Circuit Practices – British (Route Setting type only)	23	50
8	S18	Electronic Interlocking	24	100
9	S19	Signalling Relays and Cables	14	35
10	S20	Lever lock, Circuit controllers, Electrical Key Transmitter, Principles of slotting and Electric Lifting Barriers	10	25
11	S21	Electric Point Machine	14	25
12	S22	SGE Double Line Block Instrument	20	25
13	S23	Token less Block Instrument for Single Line	8	30
14	S25	Train Detection Systems-I (DC Track Circuits, Coded AFTC and SSDAC)	24	35
<b>Total</b>			<b>239</b>	<b>500</b>

**D. Theory Examination**

Exam	Subjects	Hours	Marks
<b>Exam-I</b>	S1, S2	03	100
<b>Exam-II</b>	S18	03	100
<b>Exam-III</b>	S19, S23 & S25	03	100
<b>Exam-IV</b>	S10, S20, S21, S22	03	100
<b>Exam-V</b>	S12, S13	03	100
<b>Total</b>		<b>15</b>	<b>500</b>

**E. Practicals**

Sl.No.	Lab	Hours	Marks
1	Outdoor signalling lab	39	-
2	Electrical Signalling Lab.	42	-
3	Block Lab	28	-
4	Train detection Lab	16	-
5	E- Learning	2	-
<b>Total</b>		<b>127</b>	<b>-</b>

**F. Practical Examination**

Lab	Type	Hours	Marks
<b>Outdoor signalling lab</b>	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	04	100
<b>Electrical Signalling Lab</b>		04	100
<b>Block Lab</b>		04	100
<b>Train detection Lab</b>		04	100
<b>Total</b>		<b>16</b>	<b>400</b>

**G. Miscellaneous**

Sl.No.	Description	Hours
1	Project Work Assignment	04

**H. CD Spare**

Sl.No.	Description	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	16

**2.2 Overview of Phase-II – ISJE/02**

**A. Course Program: 14 Weeks**

Sl.No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	255
3	THEORY EXAMINATION	15
4	PRACTICALS	104
5	PRACTICAL EXAMINATION	16
6	MISCELLANEOUS [Study Tour (Optional) & Projects Presentation]	14
7	CD-SPARE	13
<b>Total</b>		<b>420 Hrs</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	15	500
2	PRACTICAL	16	300
3	PROJECT WORK	08	100
4	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
5	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>		<b>39</b>	<b>1000</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	S7	Signalling in 25KV AC Electrified Section	12	25
2	S8	Signalling General	15	25
3	S9	Power Supply for Signalling	14	25
4	S11	Data Logger	08	15
5	S14	Relay Interlocking - Metal to Metal Relays (Siemens)	16	20
6	S16	RRI Siemens	32	60
7	S17	Circuit Practice-Siemens	12	20
8	S18A	Electronic Interlocking Design	30	50
9	S24	Intermediate Block Signalling, Block Proving Axle Counters and UFSBI	18	50
10	S26	Train Detection Systems-II (MSDAC)	10	50
11	S27	Signalling Safety	06	10
12	S28	TPWS, AWS, ETCS and CTC/TMS	06	10
13	S28A	KAVACH: Indian Rly Automatic Train Protection System	08	15
14	S29	Railway Signalling - Installation and Quality Practices	06	25
15	TS	6 Quad Cable	04	20
		Optic Fibre Cable		
		Control communication (Including LC Gate)	02	
		Basic of LTE	02	
		IP MPLS	04	
		Data Communication & Networking concepts		
16	G2	Rajbhasha	02	0
17	G3	Disaster Management & Accident Communication	04	0
18	G4	Establishment & DAR	12	25
19	G5	Accounts & Stores	12	25
20	G6	Tenders and Contracts	04	20
21	G7	Vigilance	02	0
22	G8	Quality and Reliability Standards	04	10
23	EL	Extension Lectures (P-Way, C&W, First Aid & Fire Fighting, OHE)	10	0
<b>Total</b>			<b>255</b>	<b>500</b>

**D. Theory Examination**

Exam	Subjects	Hours	Marks
Exam-I	S24, S26	03	100
Exam-II	S14, S16, S17	03	100
Exam-III	S18A, S27, S28, S28A, S11	03	100
Exam-IV	S7, S8, S9, S29	03	100
Exam-V	TS, G4, G5, G6 & G8	03	100
<b>Total</b>		<b>15</b>	<b>500</b>

**E. Practical**

Sl.No.	Lab	Hours	Marks
1	Outdoor Signalling Lab	14	-
2	Electrical Signalling Lab	40	-
3	Block Lab	22	-
4	Train Detection Lab	20	-
5	Optical Fibre Cable Lab	02	-
6	Outdoor Telecom Lab	02	-
7	Control Lab	02	-
8	Computer Lab (AUTO CAD)	02	-
<b>Total</b>		<b>104</b>	

**F. Practical Examination**

Sl.No.	Lab	Type	Hours	Marks
1.	Outdoor signalling lab	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	04	75
2.	Electrical Signalling Lab.		04	75
3.	Block Lab		04	75
4.	Train detection Lab		04	75
<b>Total</b>			<b>16</b>	<b>300</b>

**G. Miscellaneous**

Sl.No	Details	Hours
1	Study Tour (Optional)	06
2	Project Presentation	08
<b>Total</b>		<b>14</b>

**H. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	13

### 3.0 INITIAL COURSE FOR APP. JE/SSE (DESIGN)

Nature of Training	Training at	Duration	Marks
INSTITUTIONAL TRAINING	IRISET	PHASE I : 9 WEEKS	1750
		PHASE II: 9 WEEKS	
		(Sub-Total): 18 weeks	
FIELD TRAINING	ZONAL RAILWAYS	34 WEEKS	1250
<b>TOTAL</b>		<b>52 WEEKS</b>	<b>3000</b>

#### 3.1 OVERVIEW OF PHASE-I – IDSJE/01

##### A. Course Program: 9 Weeks

Sl.No	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	176
3	THEORY EXAMINATION	20
4	PRACTICALS	54
5	PRACTICAL EXAMINATION	10
6	MISCELLANEOUS (Project Allotment)	02
7	CD SPARE	05
<b>Total</b>		<b>270 Hrs</b>

##### B. Summary of Evaluation :

Sl.No	Topic	Hours	Marks
1	THEORY	20	600
2	PRACTICAL	08	250
3	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
4	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>		<b>28</b>	<b>950</b>



**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	G1	Personality Development	04	0
2	S1	Basics of Signalling Engineering	16	70
3	S2	Principles of Interlocking, Selection Circuits and Control Tables	20	60
4	S10	Colour Light and Automatic Signalling	08	20
5	S12	Relay Interlocking - Metal to Carbon Relays (British)	24	100
6	S13	Circuit Practices – British (Route Setting)	22	50
7	S18	Electronic Interlocking	40	80
8	S18A	Electronic Interlocking Design		
9	S19	Signalling Relays and Cables	06	30
10	S20	Lever lock, Circuit controllers, Electrical key transmitter, Principles of slotting and Electric lifting barriers	04	25
11	S21	Electric Point Machine	04	25
12	S22	SGE Double Line Block Instrument	10	50
13	S23	Token less Block Instrument for Single Line	08	50
14	S25	Train Detection Systems-I (DC Track Circuits, Coded AFTC and SSDAC)	10	40
<b>Total</b>			<b>176</b>	<b>600</b>

**D. Theory Examination**

Sl.No	Subjects	Hours	Marks
<b>Exam-I</b>	S1, S19	03	100
<b>Exam-II</b>	S25, S2	03	100
<b>Exam-III</b>	S18, S18A, S10	04	100
<b>Exam-IV</b>	S12, S13	04	150
<b>Exam-V</b>	S20, S21	03	50
<b>Exam-VI</b>	S22, S23	03	100
<b>Total</b>		<b>20</b>	<b>600</b>

**E. Practicals**

Sl.No.	Name of Lab	Hours
1	Outdoor Signalling Lab	16
2	Electrical Signalling Lab	16
3	Block Signalling Lab	07
4	Train Detection Lab	07
5	Design Lab	08
<b>Total</b>		<b>54</b>

**F. Practical Examination**

Sl.No.	Lab	Type	Hours	Marks
1	Outdoor signalling lab	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	02	50
2	Electrical Signalling Lab		02	50
3	Block Lab		02	25
4	Train Detection Lab		02	25
5	Design Lab		02	100
<b>Total</b>			<b>100</b>	<b>250</b>

**G. Miscellaneous**

Sl.No	Details	Hours
1.	Project Work Allotment	02

**H. CD Spare**

Sl.No	Details	Hours
1.	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	05

### **3.2 OVERVIEW OF PHASE-II – IDSJE/02**

#### **A. Course Program: 9 Weeks**

Sl.No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	170
3	THEORY EXAMINATION	12
4	PRACTICALS	56
5	PRACTICAL EXAMINATION	10
6	MISCELLANEOUS [Study Tour (Optional) & Project Presentation]	14
7	CD SPARE	05
	<b>Total</b>	<b>270 Hrs</b>

#### **B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	12	400
2	PRACTICAL	08	200
3	PROJECT WORK	08	100
3	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50% weightage for oral skills)	--	50
4	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
	<b>Total</b>	<b>28</b>	<b>800</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	S7	Signalling in 25KV AC Electrified Section	06	30
2	S8	Signalling General	08	40
3	S9	Power Supply for Signalling	04	30
4	S11	Data Logger	04	05
5	S14	Relay Interlocking - Metal to Metal Relays (Siemens)	12	30
6	S16	RRI Siemens	22	40
7	S17	Circuit Practice-Siemens	10	30
8	S18A	Electronic Interlocking Design	40	100
9	S24	Intermediate Block Signalling, Block Proving Axle Counters and UFSBI	08	25
10	S26	Train Detection Systems-II (MSDAC)	08	40
11	S27	Signalling Safety & accident case study	02	0
12	S28	TPWS, AWS, ETCS and CTC/TMS	02	10
13	S28A	KAVACH: Indian Railway Automatic Train Protection System	06	20
14	TS	Train Traffic Control	02	0
		Optical Fibre Cables & Systems	02	0
15	G2	Rajbhasha	02	0
16	G3	Disaster Management & Accident Communication	04	0
17	G4	Establishment & DAR	06	0
18	G5	Accounts & Stores	06	0
19	G6	Tenders and Contracts	04	0
20	G7	Vigilance	02	0
21	G8	Quality and Reliability Standards	04	0
22	EL	Extension Lecture (P-Way, C&W, Fire Fighting, First Aid)	06	0
<b>Total</b>			<b>170</b>	<b>400</b>

**D. Theory Examinations**

Sl.No.	Subjects	Hours	Marks
<b>Exam-I</b>	S7, S8, S9	03	100
<b>Exam-II</b>	S24, S26, S28, S28A, S11	03	100
<b>Exam-III</b>	S14, S16, S17	03	100
<b>Exam-IV</b>	S18A	03	100
<b>Total</b>		<b>12</b>	<b>400</b>

**E. Practical**

Sl.No.	Name of Lab	Hours
1	Outdoor Signalling Lab	04
2	Electrical Signalling Lab	18
3	Block Lab	04
4	Train Detection Lab	10
5	Control Lab	02
6	Design Lab (Including Auto CAD)	18
<b>Total</b>		<b>56</b>

**F. Practical Examination**

Sl.No.	Lab	Type	Hours	Marks
1	Outdoor signalling lab	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	02	20
2	Electrical Signalling Lab.		02	40
3	Block Lab		02	30
4	Train Detection Lab		02	30
5	Design Lab (Including Auto CAD)		02	80
<b>Total</b>			<b>10</b>	<b>200</b>

**G. Miscellaneous**

Sl. No	Details	Hours
1.	Study Tour (Optional)	6
2.	Project Work	8
<b>Total</b>		<b>14</b>

**H. CD Spare**

Sl.No	Details	Hours
1.	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	05

**4.0 INITIAL COURSE FOR PROMOTED JE/SIGNAL (INTERMEDIATE)**

Nature of Training	Training at	Duration	Marks
INSTITUTIONAL TRAINING	IRISET	PHASE I : 08 WEEKS	1900
		PHASE II: 09 WEEKS	
		(Sub-Total): 17 weeks	
FIELD TRAINING	ZONAL RAILWAYS	17 WEEKS	600
TOTAL		34 WEEKS	2500

**4.1 OVERVIEW OF PHASE-I – ISPE/01**

**A. Course Program: 8 Weeks**

Sl.No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2.	THEORY	126
3.	THEORY EXAMINATION	15
4.	PRACTICALS	64
5.	PRACTICAL EXAMINATION	12
6.	MISCELLANEOUS (Project Allotment)	04
7.	CD SPARE	16
<b>Total</b>		<b>240 Hrs</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	15	500
2	PRACTICAL	12	300
3	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50% weightage for oral skills)	--	50
4	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>		<b>27</b>	<b>900</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	S1	Basics of Signal Engineering	12	40
2	S2	Principle of Interlocking, Selection Circuits and Control Tables	18	20
3	S10	Colour Light and Automatic Signalling	10	30
4	S12	Relay Interlocking - Metal to Carbon Relays (British)	14	40
5	S13	Circuit Practices – British (Route Setting)	06	40
6	S19	Signalling Relays and Cables	03	30
7	S20	Lever lock, Circuit controllers, Electrical Key Transmitter, Principles of slotting and Electric Lifting Barriers	03	30
8	S21	Electric Point Machine	02	25
9	S22	SGE Double Line Block Instrument	06	25
10	S23	Token less Block Instrument for Single Line	10	50
11	S25	Train Detection Systems -I (DC Track Circuits, Coded AFTC and SSDAC)	12	70
12	S18	Electronic Interlocking	30	100
<b>Total</b>			<b>126</b>	<b>500</b>

**D. Theory Examinations**

Exam	Subjects	Hrs	Marks
<b>Exam-I</b>	S1, S19, S20	03	100
<b>Exam-II</b>	S10, S25	03	100
<b>Exam-III</b>	S2, S12, S13	03	100
<b>Exam-IV</b>	S21, S22 & S23	03	100
<b>Exam-V</b>	S18	03	100
<b>Total</b>		<b>15</b>	<b>500</b>

**E. Practical**

Sl.No.	Lab	Hours
1	Outdoor Signalling Lab	21
2	Electrical Signalling Lab	22
3	Block Signalling Lab	11
4	Train Detection Lab	08
5	E-Learning	02
<b>Total</b>		<b>64</b>

**F. Practical Examination**

Sl.No.	Lab	Type	Hours	Marks
1	Outdoor Signalling Lab	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	03	75
2	Electrical Signalling Lab		03	75
3	Block Signalling Lab		03	75
4	Train Detection Lab		03	75
<b>Total</b>			<b>12</b>	<b>300</b>

**G. Miscellaneous**

Sl.No	Item	Hours
1	Project Allotment	04

**H. CD Spare**

Sl.No	Details	Hours
1.	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	16



**4.2 Overview of Phase-II – ISPE/02**

**A. Course Program : 9 Weeks**

Sl.No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2.	THEORY	180
3.	THEORY EXAMINATION	15
4.	PRACTICALS	43
5.	PRACTICAL EXAMINATION	12
6.	MISCELLANEOUS (Project Presentation)	06
7.	CD SPARE	11
<b>Total</b>		<b>270 Hrs</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	15	500
2	PRACTICAL	12	300
3	PROJECT WORK	06	100
4	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
5	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>		<b>33</b>	<b>1000</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	S7	Signalling in 25KV AC Electrified Section	06	25
2	S8	Signalling General	08	25
3	S9	Power Supply for Signalling	06	25
4	S14	Relay Interlocking - Metal to Metal Relays (Siemens)	08	50
5	S11	Data Logger	06	20
6	S16	RRI Siemens	22	50
7	S18A	Electronic Interlocking Design	26	40
8	S24	Intermediate Block Signalling, Block Proving Axle Counters and UFSBI	16	40
9	S26	Train Detection Systems-II (MSDAC)	10	40
10	S27	Signalling Safety	04	20
11	S28	TPWS, AWS , ETCS and CTC/TMS	05	20
12	S28A	KAVACH - Indian Rly Automatic Train Protection System	08	20
13	S29	Railway Signalling - Installation and Quality Practice	06	25
14	TS	Control Communication	02	20
		Optic Fibre Cables	02	
		LTE	02	
		Data Communication & Networking	02	
15	G2	Rajbhasha	02	0
16	G3	Disaster Management & Accident Communication	04	0
17	G4	Establishment & DAR	06	25
18	G5	Accounts & Stores	06	25
19	G6	Tenders and Contracts	04	30
20	G7	Vigilance	02	0
21	G1	Personality Development	05	0
22	G8	Quality and Reliability Standards	04	0
23	EL	Extension Lecture (P-way, C & W, Fire Fighting, First Aid)	08	0
<b>Total</b>			<b>180</b>	<b>500</b>

**D. Theory Examinations**

Exam	Subjects	Hours	Marks
Exam-I	S7, S8, S9, S29	03	100
Exam-II	S11, S24, S26	03	100
Exam-III	S14 & S16	03	100
Exam-IV	S18A, S27, S28 & S28A	03	100
Exam-V	TS, G4, G5, G6	03	100
<b>Total</b>		<b>15</b>	<b>500</b>

**E. Practical**

Sl.No	Lab	Hours	Marks
1	Outdoor Signalling Lab	04	--
2	Electrical Signalling Lab	18	--
3	Block Signalling Lab	05	--
4	Train Detection Lab	16	--
<b>Total</b>		<b>43</b>	<b>--</b>

**F. Practical Examination**

Sl.No.	Lab	Type	Hours	Marks
1	Outdoor Signalling Lab	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	03	75
2	Electrical Signalling Lab		03	75
3	Block Signalling Lab		03	75
4	Train Detection Lab		03	75
<b>Total</b>			<b>12</b>	<b>300</b>

**G. Miscellaneous**

Sl.No	Item	Hours
1	Projects Evaluation	06

**H. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	11

**5.0 REFRESHER COURSE FOR SSE/JE (SIGNAL & DESIGN)**

Name of Training	Training at	Duration	Marks
<b>INSTITUTIONAL TRAINING</b>	<b>IRISET</b>	<b>04 Weeks</b>	<b>200</b>

**A. Course Program - RSSJE**

Sl.No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2.	THEORY	80
3.	THEORY EXAMINATION	02
4.	PRACTICALS	29
5.	CD SPARE	06
<b>Total</b>		<b>120</b>

**B. Summary of Evaluation:**

Sl. No.	Topic	Hours	Marks
1	THEORY	03	100
2	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50% weightage for oral skills)	--	50
3	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>200</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	S7	Signalling in 25KV AC Electrified Section	04	04
2	S8	Signalling General	04	06
3	S9	Power Supply for Signalling	03	06
4	S10	Colour Light and Automatic Signalling	02	06
5	S11	Data logger	03	06
6*	S12	Relay Interlocking - Metal to Carbon Relays (British)	07	18
7*	S14	Relay Interlocking - Metal to Metal Relays (Siemens)	07	18
8	S18	Electronic Interlocking	08	12
9	S18A	Electronic Interlocking Design	09	
10	S20	Lever Lock, Circuit controllers, Electrical key Transmitter, Principles of slotting and Electric Lifting Barriers	02	0
11	S21	Electric Point Machine	02	06
12	S24	Intermediate Block Signalling, Block Proving Axle Counters and UFSBI	04	10
13	S25	Train Detection Systems-I (DC Track Circuits, Coded AFTC and SSDAC)	02	05
14	S26	Train Detection Systems-II (MSDAC)	04	10
15	S27	Signalling Safety	02	0
16	S28	TPWS, AWS, ETCS & CTC/TMS	04	08
17	S28A	KAVACH- Indian Rly Automatic Train protection	02	03
18	G3	Disaster Management & Accident communication	02	0
19	G4	Establishment & DAR	03	0
20	G5	Stores & Accounts	04	0
21	G6	Tenders & Contracts	03	0
22	G7	Vigilance	02	0
23	G8	Quality & Reliability Standards	02	0
24	EL	Extension Lecture (P-Way)	02	0
<b>Total</b>			<b>80</b>	<b>100</b>

\*Option to be taken from trainees

**D. Theory Examination**

Sl.No	Exam	Marks	Hours
1	Exam-1 (Subjective)	30	01
2	Exam-2 (Objective)	70	01
<b>TOTAL</b>		<b>100</b>	<b>02</b>

**E. Practical**

Sl.No.	Lab	Hours
1	Electrical Signalling Lab.	08
2	Block Signalling Lab	07
3	Outdoor Signalling Lab	04
4	Train Detection Lab	10
<b>Total</b>		<b>29</b>

**F. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	06

## **TELECOM COURSES**

**COURSES FOR Gr B OFFICERS**  
**(Signal to Tele)**



**6.0 INTEGRATION COURSE FOR GROUP B OFFICERS  
(SIG TO TELE)**

Nature of Training	Training at	Duration
INSTITUTIONAL TRAINING	IRISET	PHASE I: 2 WEEKS
		PHASE II: 2 WEEKS
		<b>(Sub-Total): 04 weeks</b>

**6.1 OVERVIEW OF PHASE-I - IBTT/01**

**A. Course Program: 02 Weeks**

Sl. No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	02
2	THEORY	27
3	PRACTICALS	18
4	LOCAL VISIT	02
5	THEORY EXAMINATION+ONLINE EXAM	04
6	LIBRARY/HOLIDAYS/EXTRA CLASSES/CD SPARE	07
<b>Total</b>		<b>60 Hrs</b>

**B: Theory**

Sl.No.	Code	Subject	Hours	Marks
1	TC1	Telecom Cables (Copper)	03	25
2	TC4	Power Supply arrangements for Telecom	04	25
3	TCS4	ISDN Exchange and Advancements	04	25
4	TCS6	IP Telephony and NGN	04	25
5	TC6	Train Traffic Control	04	25
6	TCT4	OFC Systems	04	25
7	TCT3	Programmable Digital Drop-Insert E1 Multiplexers	02	25
8	TB1	Telecom General	02	25
<b>Total</b>			<b>27</b>	<b>200</b>

**C. Practical**

Sl.No.	Lab	Hours	Marks
1	Transmission Systems Lab	04	--
2	Telephony Lab	06	--
3	Train Traffic Control Lab	04	---
4	Out Door Telecom Lab (Cables )	04	--
<b>Total</b>		<b>18</b>	

**D: LOCAL VISIT**

Sl.No.	SUBJECT (Name of Firm/Premises)	Hours
1	Visit to Railnet SDH Installation, Secunderabad	02
<b>Total</b>		<b>02</b>

**E: Theory Examination**

Exam	Subjects	Marks	Types of Exam	Hours
<b>Exam-I</b>	TC4, TB1, TCS4, TCS6	25 Marks Each Sub.	Objective-70% & Subjective-30%	02
<b>Exam-II</b>	TC1, TC6, TCT3, TCT4	25 Marks Each Sub		02
<b>Total</b>		<b>200 Marks</b>		<b>04</b>

**G. CD Spare**

Sl.No.	Item	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	07

## 6.2 OVERVIEW OF PHASE-II – IBTT/02

### A. Course Program : 02 Weeks

Sl.No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	02
2.	THEORY	27
3.	PRACTICALS	18
4.	LOCAL VISIT/STUDY TOUR	02
5.	PROJECT PRESENTATION	04
6.	THEORY EXAMINATION +ONLINE OBJECTIVE EXAM	04
7.	CD SPARE	03
	<b>Total</b>	<b>60 Hrs</b>

### B:Theory

Sl.No.	Subject Code	Subject	Hours	Marks
1	TC2	Public Address system	01	25
2	TC3	Passenger Information System & ISS	02	25
3	TA1	VHF + Mobile Communications	02	25
4	TA2	Data communication & Networking	06	25
5	TA3	Data Networks of IR	02	25
6	TCT6	SDH Equipments	02	25
7	TA5	LTE	04	25
8	TA6	IP-MPLS	04	25
9	G3	Disaster Management & Accident Communication	02	0
10	G8	Quality and Reliability Standards	02	0
		<b>Total</b>	<b>27</b>	<b>200</b>

**C. Practical**

Sl.No.	Name of Lab	Name of Lab	Hours
1	Tx Lab	SDH Equipment, NMS, Hierarchy	04
2	Tx Lab	VHF Programming, GSM-R Introduction	04
3	PIS Lab	PIS, PA System- Introduction and General Familiarization	04
4	NW Lab	IP addresses, Simple Network checking, demonstration for UTS and other equipment	06
<b>Total</b>			<b>18</b>

**D: LOCAL VISIT /STUDY TOUR**

Sl.No.	SUBJECT (Name of Firm/Premises)	Hours
1	Passenger Amenities at SC Station	02
<b>Total</b>		<b>02</b>

**E: PROJECT PRESENTATION**

Sl.No.	Description	Marks	Hours
1	<b>Project Presentation</b>	100	04
<b>Total</b>		<b>100</b>	<b>04</b>

**F: Theory Examination**

Sl No	Exam	Subjects	Marks	Types of Exam	Hours
1	Exam-I	TC2, TC3, TA5, TCT6	25 Marks Each Subject	Objective-70% & Subjective-30%	02
2	Exam-II	TA1, TA2, TA3 & TA6	25 Marks Each Subject		02
<b>Total</b>					<b>04</b>

**F: CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	03

**COURSES FOR JE/SSE  
TELECOM**

**7.0 INITIAL COURSE FOR APP.JE (TELECOM)**

Nature of Training	Training at	Duration	Marks
INSTITUTIONAL TRAINING	IRISET	PHASE I: 14 WEEKS	2000
		PHASE II: 14 WEEKS	
		(Sub-Total): 28 weeks	
FIELD TRAINING	ZONAL RAILWAYS	24 WEEKS	1000
TOTAL		52 WEEKS	3000

**7.1 OVERVIEW OF PHASE-I – ITJE/01**

**A. Course Program: 14 Weeks**

Sl.No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	198
3	THEORY EXAMINATION	15
4	PRACTICALS	152
5	PRACTICAL EXAMINATION	20
6	MISCELLANEOUS (Project Allotment)	10
7	CD SPARE	22
<b>Total</b>		<b>420 Hrs</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	15	500
2	PRACTICAL	20	400
3	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
4	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>1000</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	G1	Personality Development	10	0
2	TB1	Telecom General Part-I	08	50
3	TB4	Modulation Techniques (Digital)	04	25
4	TB5	Radio Propagation	04	25
5	TC1	Telecom Cables (Copper)	14	50
6	TC2	Public Address System	07	25
7	TC4	Power Supply Arrangement	12	50
8	TC6	Train Traffic Control	19	50
9	TCS4	ISDN Exchange and Advancements	18	50
10	TCS6	IP Telephony and NGN	10	25
11	TCT2	PCM-TDM Principles	06	25
12	TCT3	Programmable Digital Drop-Insert E1 Multiplexers	10	25
13	TA2	Data communication & Networking	28	50
14	ST	Basic concepts of Signalling	24	25
15		Block signalling /BPAC/Dataloggers	10	25
16	G2	Official Language	02	0
17	G8	Quality & Reliability standards	04	0
18	EL	Extension Lectures	08	0
<b>Total</b>			<b>198</b>	<b>500</b>

**D. Theory Examination**

Exam	Subjects	Hours	Marks
<b>Exam-I</b>	TB1(Part-1), TB4, TB5	03	100
<b>Exam-II</b>	TC2, TCS4 & TCS6	03	100
<b>Exam-III</b>	TC6, TCT2, TCT3	03	100
<b>Exam-IV</b>	TC1, TA2	03	100
<b>Exam-V</b>	TC4, ST	03	100
<b>Total</b>		<b>15</b>	<b>500</b>

**E. Practicals**

Sl.No.	Name of Lab	Hours	Marks
1	Signalling Labs	12	---
2	Train Traffic Control Lab (Control)	20	---
3	Out door Telecom Lab (Cables)	20	---
4	Telephony Lab	30	---
5	Transmission Systems Lab	40	---
6	Networking Lab	30	---
<b>Total</b>		<b>152</b>	<b>---</b>

**F. Practical Examinations**

Sl.No	Name of the Lab	Type	Hours	Marks
1	Train Traffic Control Lab (Control)	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	04	50
2	Outdoor Telecom Lab (Cables)		04	50
3	Telephony Lab		04	100
4	Transmission Systems Lab		04	100
5	Networking Lab		04	100
		<b>Total</b>	<b>20</b>	<b>400</b>

**G. Miscellaneous**

Sl.No.	Description	Hours
1	Project Allotment, Study Tour etc	10

**H. CD Spare**

Sl.No.	Description	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	22



**7.1 Overview of Phase-II – ITJE/02**

**A. Course Program: 14 Weeks**

Sl.No.	Details	Hours
1	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2	THEORY	230
3	THEORY EXAMINATION	15
4	PRACTICALS	98
5	PRACTICAL EXAMINATION	20
6	MISCELLANEOUS [STUDY TOUR (OPTIONAL) & PROJECTS EVALUATION]	24
7	CD-SPARE	30
<b>Total</b>		<b>420 Hrs</b>

**B. Summary Of Evaluation**

Sl.No	Topic	Hours	Marks
1	THEORY	15	500
2	PRACTICAL	20	300
3	PROJECT WORK	12	100
4	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
5	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>1000</b>

**C. Theory**

Sl. No.	Code	Subject	Hours	Marks
1	TB1	Telecom General Part II	06	25
2	TC3	Passenger Information System & ISS	14	50
3	TCT5	SDH Principles	10	25
4	TCT6	SDH Equipment	20	50
5	TA1	Mobile Communication	20	50
6	TA3	Data Networks of IR	10	25
7	TCT4	OFC Systems	14	50
8	TC5	Earthing & surge protection for Telecom. Installations	08	25
9	TA5	LTE	24	50
10	TA6	IP-MPLS	24	50
11	G3	Disaster Management Communications	08	20
12	G4	Establishment & DAR	12	20
13	G5	Accounts & Stores	12	20
14	G6	Tenders & Contracts	04	20
15	G7	Vigilance	02	0
16	EL	SACFA Clearances/RCIL/PTCC/IRPMU/CRIS etc	10	0
17	EL	Recent Circulars	08	20
18	VL	Visiting Lecturers	24	0
<b>Total</b>			<b>230</b>	<b>500</b>

**D. Theory Examination**

Sl. No	Exam	Subjects	Hours	Marks
1	Exam-I	TB1(Part-II), TC3, TC5	03	100
2	Exam-II	TCT4, TCT6	03	100
3	Exam-III	TA3, TA6 & TCT5	03	100
4	Exam-IV	TA1 & TA5	03	100
5	Exam-V	G3, G4, G5, G6 & EL	03	100
<b>Total</b>			<b>15</b>	<b>500</b>

**E. Practicals**

Sl.No.	Experiments	Hours	Marks
1	Passenger Information System Lab.	12	---
2	Outdoor Telecom Lab	08	---
3	Transmission Systems Lab (OFC)	20	---
4	Transmission Systems Lab (SDH)	34	
5	Transmission Systems Lab (NMS)	12	
6	Networking Lab	12	---
<b>Total</b>		<b>98</b>	<b>---</b>

**F. Practical Examinations**

Sl.No.	Name of the Lab	Type	Hours	Marks
1	Passenger Information System Lab.	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	04	50
2	Outdoor Telecom Lab		04	50
3	Transmission Systems Lab (OFC), (SDH), (NMS)		08	100
4				
5				
6	Networking Lab		04	100
<b>Total</b>			<b>20</b>	<b>300</b>

**G. Miscellaneous**

Sl.No	Details	Hours
1	Study Tour (Optional)	12
2	Project Presentation	12
<b>Total</b>		<b>24</b>

**H. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	30

**8.0 INITIAL COURSE FOR PROMOTED JE/TELE (INTERMEDIATE)**

Nature of Training	Training at	Duration	Marks
INSTITUTIONAL TRAINING	IRISET	PHASE I: 06 WEEKS	1600
		PHASE II: 06 WEEKS	
		(Sub-Total): 12 weeks	
FIELD TRAINING	ZONAL RAILWAYS	22 WEEKS	600
TOTAL		34 WEEKS	2200

**8.1 OVERVIEW OF PHASE-I – ITIN/01**

**A. Course Program: 6 Weeks**

Sl.No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2.	THEORY	65
3.	THEORY EXAMINATIONs	12
4.	PRACTICALS	76
5.	PRACTICAL EXAMINATIONs	10
6.	MISCELLANEOUS (Project Allotment, Study Tour etc)	08
7.	CD SPARE	06
<b>Total</b>		<b>180 Hrs</b>

**B. Summary Of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	12	400
2	PRACTICAL	10	250
3	ORGANIZATIONAL SKILLS (50% weightage for writing Skill and 50 % weightage for oral skills)	--	50
4	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>750</b>

**C. Theory**

Sl. No.	Code	Subject	Hours	Marks
1	TC1	Telecom Cables (Copper)	06	50
2	TB1	Telecom General	04	25
3	TCS4	ISDN Exchange and Advancements	08	50
4	TCS6	IP Telephony & NGN	06	50
5	TCT2	PCM-TDM Principles	04	25
6	TCT3	Programmable Digital Drop-Insert EI Multiplexers	08	50
7	TC6	Train Traffic Control	08	50
8	TA2	Data communication & Networking	16	100
9	G1	Personality Development	05	0
<b>Total</b>			<b>65</b>	<b>400</b>

**D. Theory Examination**

Sl. No.	Subjects	Hours	Marks
<b>Exam-I</b>	TB1, TCT2 & TCT3	03	100
<b>Exam-II</b>	TCS4 & TCS6	03	100
<b>Exam-III</b>	TC1 & TC6	03	100
<b>Exam-IV</b>	TA2	03	100
<b>Total</b>		<b>12</b>	<b>400</b>

**E. Practical**

Sl.No.	Lab	Hours	Marks
1	Train Traffic Control Lab	16	---
2	Out Door Telecom Lab	12	---
3	Telephony Lab	18	---
4	Transmission Systems Lab (MUX)	16	---
5	Network Lab	14	---
<b>Total</b>		<b>76</b>	<b>---</b>

**F. Practical Examinations**

Sl.No.	Lab	Type	Hours	Marks
1	Train Traffic Control Lab	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	02	50
2	Out Door Telecom Lab		02	50
3	Telephony Lab		02	50
4	Transmission Systems Lab (MUX)		02	50
5	Network Lab		02	50
<b>Total</b>			<b>10</b>	<b>250</b>

**G. Miscellaneous**

Sl.No	Details	Hours
1	Project Allotment, Study Tour etc	08
	<b>Total</b>	<b>08</b>

**H. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Library, Group Discussion, Extra hours for any subject etc	06

**8.2 Overview of Phase-II – ITIN/02**

**A. Course Program: 6 Weeks**

Sl.No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	03
2.	THEORY	104
3.	THEORY EXAMINATION	14
4.	PRACTICALS	40
5.	PRACTICAL EXAMINATIONS	08
6.	MISCELLANEOUS (Project Evaluation, Study Tour etc)	08
7.	CD SPARE	03
<b>Total</b>		<b>180 Hrs</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	14	450
2	PRACTICAL	08	200
3	PROJECT WORK	08	100
4	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
5	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>850</b>

**C. Theory**

Sl.No.	Code	Subject	Hours	Marks
1	TB1	Telecom General –Part-II	04	0
2	TC2	Public Address System	04	25
3	TC3	Passenger Information System	06	25
4	TC4	Power Plant practice	06	25
5	TCT5	SDH Principles	06	25
6	TCT6	SDH Equipment	08	50
7	TA1	Mobile Communications	06	50
8	TA3	Data Networks of IR	04	25
9	TCT4	OFC Systems	06	25
10	TC5	Earthing & Surge Protection for Telecom.	06	50
11	TA5	LTE	06	25
12	TA6	IP-MPLS	06	25
13	ST	Basic concepts of signalling	04	25
14	G2	Official Language	02	0
15	G3	Disaster management communication	04	0
16	G4	Establishment Matters	06	25
17	G5	Accounts & Stores	06	25
18	G6	Tenders & Contracts	04	25
19	G7	Vigilance	02	0
20	G8	Quality & Reliability Standards	04	0
21	EL	Recent Circulars	04	0
		<b>Total</b>	<b>104</b>	<b>450</b>

**D. Theory Examination**

Sl. No.	Subjects	Hours	Marks
<b>Exam-I</b>	TC3, TC4 & TC5	03	100
<b>Exam-II</b>	TCT4, TCT5 & TCT6	03	100
<b>Exam-III</b>	S1, G4, G5 & G6	03	100
<b>Exam-IV</b>	TA1, TA5 & TA6	03	100
<b>Exam-V</b>	TC2 & TA3	02	50
	<b>Total</b>	<b>14</b>	<b>450</b>



**E. Practical**

Sl.No.	Lab	Hours	Marks
1	Transmission Systems Lab (MUX)	20	--
2	Network Lab	14	--
3	Passenger Information System	04	--
4	Computer Lab	02	--
<b>Total</b>		<b>40</b>	

**F. Practical Examination**

Sl.No.	Lab	Type	Hours	Marks
1	Transmission Systems Lab (MUX)	Record Sheets (20%) Experiment (50%) Viva-voce (30%)	04	100
2	Network Lab		03	75
3	Passenger Information System		01	25
<b>Total</b>			<b>08</b>	<b>200</b>

**G. Miscellaneous**

Sl.No	Details	Hours
1	Project Presentation	08
<b>Total</b>		<b>08</b>

**H. CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Library, Group Discussion, Extra hours for any subject etc	03

**9: REFRESHER COURSE FOR SSE/JE (TELECOM)**

Nature of Training	Training at	Duration	Marks
<b>INSTITUTIONAL TRAINING</b>	<b>IRISET</b>	<b>04 WEEKS</b>	<b>200</b>

**A. Course Program – RTSJE**

Sl. No	Details	Hours
1.	BRIEFING, REGISTRATION & OPEN HOUSE DISCUSSION	02
2.	THEORY	71
3.	PRACTICALS	30
4.	THEORY EXAMINATION	03
5.	CD SPARE	06
6.	MISCELLENEOUS (Project/Case Studies / Experience Sharing)	08
<b>Total</b>		<b>120</b>

**B. Summary of Evaluation:**

Sl.No	Topic	Hours	Marks
1	THEORY	03	100
2	ORGANIZATIONAL SKILLS (50% weightage for writing skills and 50 % weightage for oral skills)	--	50
3	TRAINEE'S PARTICIPATION IN EXTRA CURRICULAR ACTIVITIES	--	50
<b>Total</b>			<b>200</b>

**C. Theory**

Sl. No.	Subject Code	Subject	Hours	Marks
1	TB1	Telecom General	02	05
2	TC1	Telecom Cables (Copper)	02	0
3	TC3	Passenger Information System	02	05
4	TC4	Power Supply Arrangement	04	10
5	TC5	Earthing & surge protection for Telecom. Installations	02	05
6	TC6	Train Traffic Control	02	05
7	TCS4	ISDN Exchange, IP telephony and Advancements	04	10
8	TCT3	Programmable Digital Drop-Insert E1 PDH Equipments	02	05
9	TCT4	OFC Systems	03	05
10	TCT6	SDH Equipments	04	10
11	TA1	Mobile Communication	04	10
12	TA2	Data communication & Networking/security/NGN	06	10
13	TA5	LTE	04	10
14	TA6	IP-MPLS	04	10
15	ST	Basic Concepts of Signaling	02	0
16	G3	Disaster Management Communications	04	0
17	G4	Establishment & DAR	06	0
18	G5	Accounts & Stores	06	0
19	G6	Tenders & Contracts	04	0
20	G7	Vigilance	02	0
21	G8	Quality & Reliability Standards	02	0
<b>Total</b>			<b>71</b>	<b>100</b>

**D. Theory Examination**

Exam	Type	Hours	Marks
Exam-I	Subjective	01	30
Exam-II	Objective	01	70
<b>Total</b>		<b>02</b>	<b>100</b>

**E. Practicals**

Sl.No.	Name of Lab	Hours
1	TRAIN TRAFFIC CONTROL	02
2	OUT DOOR TELECOM (Cables)	02
3	PASSENGER INFORMATION SYSTEM	02
4	TELEPHONY	06
5	TRANSMISSION SYSTEM (OFC)	10
6	NETWORKING	08
<b>Total</b>		<b>30</b>

**F: Miscellaneous**

Sl. No	Details	Hours
1	Project/Case Studies/Experience Sharing	08
<b>Total</b>		<b>08</b>

**G: CD Spare**

Sl.No	Details	Hours
1	Holidays, Local Visit, Shramdaan, Social service, Extra hours for any subject etc	06

# ANNEXURES

## **INDEX OF SUBJECTS**

**ANNEXURE-I**

**INDEX OF SUBJECTS-IRISET**

**SIGNALLING SUBJECTS**

Sl No	CODE	NAME OF SUBJECT
1	S1	Basics of Signal Engineering
2	S2	Principles of Interlocking, Selection Circuits and Control Tables
3	S3	Mechanical Signalling - Single Wire & Rodding
4	S7	Signalling in 25KV AC Electrified Section
5	S8	Signalling General
6	S9	Power Supply for Signalling
7	S10	Colour Light and Automatic Signalling
8	S11	Data Loggers
9	S12	Relay Interlocking - Metal to Carbon Relays (British)
10	S13	Circuit Practices - British (Route Setting)
11	S14	Relay Interlocking - Metal to Metal Relays (Siemens)
12	S16	RRI Siemens
13	S17	Circuit Practice - Siemens
14	S18	Electronic Interlocking
15	S18A	Electronic Interlocking Design
16	S19	Signalling Relays and Cables
17	S20	Lever Lock, Circuit controllers, Electrical key Transmitter, Principles of slotting and Electric Lifting Barriers
18	S21	Electric Point Machine
19	S22	SGE Double Line Block Instrument
20	S23	Tokenless Block Instrument for Single Line
21	S24	Intermediate Block Signalling, Block Proving Axle Counters and UFSBI
22	S25	Train Detection Systems-I (DC Track Circuits, Coded AFTC and SSDAC)
23	S26	Train Detection Systems – II (MSDAC)
24	S27	Signalling Safety
25	S28	TPWS, AWS, ETCS and CTC/TMS
26	S28A	KAVACH - Indian Rly Automatic Train Protection System
27	S29	Railway Signalling - Installation and Quality Practices
28	S30	Signalling Data Handbook
29	TS	Telecom for Signal Engineers [6 Quad Cable, OFC, Control communication (including LC Gate communication), Basics of LTE, IP MPLS, Data communication & Networking Concepts]

**TELECOM SUBJECTS**

Sl No	CODE	NAME OF SUBJECT
1	THB	Telecom Hand Book
2	TA1	Mobile Communication
3	TA2	Data Networks
4	TA3	Data networks of IR
5	TA4	Cyber Security
6	TA5	LTE
7	TA6	IP MPLS
8	TB1	Telecom General
9	TB4	Digital Modulation Technique
10	TB5	Radio propagation
11	TC1	Telecom Cables (Copper)
12	TC2	Public Address System
13	TC3	Passenger Information System
14	TC4	Power Supply Arrangements
15	TC5	Earthing and Surge Protection
16	TC6	Train Traffic Control
17	TCS4	ISDN Exchange and Advancements
18	TCS6	IP Telephony and NGN
19	TCT1	Digital Radio Equipment
20	TCT2	PCM-TDM Principles
21	TCT3	Programmable Digital Drop- Insert E1 Multiplexers
22	TCT4	OFC Systems
23	TCT5	SDH Principles
24	TCT6	SDH Equipment
25	ST	Railway Signal for Telecom Engineers [Basic concepts of Signalling, Block Signalling, BPAC, Dataloggers]



**GENERAL SUBJECTS**

Sl No	CODE	NAME OF SUBJECT
1	G1	Personality Development
2	G2	Official Language
3	G3	Disaster Management & Accident Communication
4	G4	Establishment & DAR
5	G5	Accounts & Stores
6	G6	Tenders & Contracts
7	G7	Vigilance
8	G8	Quality and Reliability Standards

**INDICATIVE LIST OF SUB-TOPICS UNDER GENERAL SUBJECTS**

SI No	Code	Name of Sub-Topics
G1	<b>Personality Development</b>	<ul style="list-style-type: none"> <li>● Etiquette &amp; Conduct</li> <li>● Team Work &amp; Interpersonal skills</li> <li>● Gender Sensitisation</li> <li>● Personal Safety</li> <li>● Ethics in working</li> <li>● Development of Leadership skills &amp; Motivation</li> <li>● Decision making</li> <li>● Communication &amp; Effective Technical Writing Skills</li> <li>● Stress Management</li> <li>● Inter-departmental coordination</li> </ul>
G2	<b>Official Language</b>	<ul style="list-style-type: none"> <li>● Constitutional Provisions of official language Hindi</li> <li>● The Official languages Act, 1963 (as amended, 1967)</li> <li>● The Official language (use for official purpose of the union) Rules, 1976 (as amended 1987, 2007 &amp; 2011)</li> <li>● Annual Programme issued by Dept of Official Language, MHA</li> <li>● Incentive Schemes for progressive use and propagation of Hindi</li> <li>● Questions and answers about Official language Rules for Departmental Examinations</li> <li>● Sequence of events with reference to official language of the union</li> <li>● Hindi in computers – UNICODE</li> <li>● Hindi equivalents of some important words commonly used in S&amp;T department</li> </ul>
G3	<b>Disaster Management and Accident Communication</b>	<ul style="list-style-type: none"> <li>● Disasters &amp; Accidents</li> <li>● Management of Disasters</li> <li>● Accident Medical Relief Van</li> <li>● Accident Relief Trains</li> <li>● Communication Arrangement during Disaster (in greater detail to Telecom supervisors)</li> <li>● Dos &amp; Don'ts</li> <li>● Important Circulars</li> <li>● Inputs on Permanent Way and C&amp;W matters (only for Signal Supervisors, through visiting lectures)</li> <li>● First Aid</li> <li>● Fire Safety</li> </ul>
G4	<b>Establishment &amp; DAR</b>	<ul style="list-style-type: none"> <li>● Pay &amp; Allowances Advances</li> <li>● NPS &amp; Retirement benefits</li> <li>● Conduct Rules</li> <li>● D&amp;A Rules</li> <li>● Leave &amp; Pass Rules</li> <li>● Medical Attendance Rules</li> </ul>

		<ul style="list-style-type: none"> <li>● Selections and Promotions</li> <li>● Railway Servants (Hours of Work and Period of Rest) Rules, 2005</li> <li>● Employees' Compensation Act</li> <li>● Introduction to basics of HRMS including UMID and ePass</li> <li>● Introduction to basics of e-Office</li> <li>● Introduction to basics of RTI</li> <li>● Brief introduction to the concepts - APARs, Immovable Property Returns and Grievance Redressal Mechanism</li> </ul>
<b>G5</b>	<b>Accounts and Stores</b>	<p><b>Accounts</b></p> <ul style="list-style-type: none"> <li>● Canons of financial propriety</li> <li>● Interaction with Finance dept</li> <li>● Basics of Budgeting</li> <li>● Work proposals &amp; Allocations</li> </ul> <p><b>Stores</b></p> <ul style="list-style-type: none"> <li>● Classification of Stores</li> <li>● GeM and Procurement methods</li> <li>● Introduction to basics of iMMIS and IREPS</li> <li>● Inventory Control, Surplus Stores &amp; Scrap disposal</li> </ul>
<b>G6</b>	<b>Tenders and Contracts</b>	<ul style="list-style-type: none"> <li>● Survey and Estimates</li> <li>● Stages of tendering</li> <li>● Contract Management</li> <li>● Differences between Works &amp; Service Contracts</li> <li>● Introduction to basics of IRPSM &amp; IREPS</li> </ul>
<b>G7</b>	<b>Vigilance</b>	<ul style="list-style-type: none"> <li>● Vigilance organisation</li> <li>● Preventive vigilance</li> <li>● Case Studies</li> </ul>
<b>G8</b>	<b>Quality and Reliability Standards</b>	<ul style="list-style-type: none"> <li>● Introduction to Reliability Parameters (MTBF, MTTR, MTBWSF etc.)</li> <li>● Introduction to CENELEC Standards</li> <li>● Introduction to ISO &amp; RDSO Standards/Specifications</li> <li>● Any other standards relevant to target trainees</li> </ul>

Note: If some of the topics are covered in external lectures, they may be excluded from the purview of the concerned subject's instruction hours indicated.