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ELECTRONIC PRINCIPLES PRECISION PHOTOGRAPHIC SYSTEMS CAREER LAD--ETC(U)
MAY 77 T J O'CONNOR, W F KASPER

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OCCUPATIONAL SURVEY REPORT

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ELECTRONIC PRINCIPLES
 PRECISION PHOTOGRAPHIC SYSTEMS
 CAREER LADDER
 AFSC 404X0

AFPT 90-404-222

15 MAY 1977

OCCUPATIONAL SURVEY BRANCH
 USAF OCCUPATIONAL MEASUREMENT CENTER
 LACKLAND AFB TEXAS 78236

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFPT 90-404-222	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Electronic Principles Precision Photographic Systems Career Ladder AFSC 404X0		5. TYPE OF REPORT & PERIOD COVERED FINAL Jul 76 - Oct 76
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Thomas J. O'Connor Walter F. Kasper		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Occupational Survey Branch USAF Occupational Measurement Center Lackland AFB TX 78236		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS N/A
11. CONTROLLING OFFICE NAME AND ADDRESS SAME AS ITEM 9		12. REPORT DATE 15 May 77
		13. NUMBER OF PAGES 44
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Electronic principles Electronics Basic electronics Air Force training Avionics Teaching methods Electronic equipment Training Electronic technicians		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned to Precision Photographic Systems Specialty (AFSC 404X0). The report gives a detailed listing of the technical tasks and knowledge needed to perform the jobs within the specialty or career ladder. CONTINUED (OVER)		

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PREFACE

This report presents a summary of the results of a detailed Air Force Electronic Principles Survey of the Precision Photographic Systems Specialty, AFSC 404X0.

The Electronic Principles Inventory (EPI) was developed by Major Thomas J. O'Connor and Mr. Hendrick W. Ruck and the survey data were analyzed by Major Walter F. Kasper. All are members of the Occupational Survey Branch, USAF Occupational Measurement Center, Lackland AFB, Texas.

Computer programs for analyzing the data were designed by Dr. Raymond E. Christal, Occupational and Manpower Research Division, Air Force Human Resources Laboratory (AFHRL), and were written by the Project Analysis and Programming Branch, Computational Sciences Division, AFHRL.

Distribution of this report is made upon request to the USAF Occupational Measurement Center, attention of the Chief, Occupational Survey Branch (OMY), Lackland AFB, Texas 78236.

This report has been reviewed and is approved.

JAMES A. TURNER, JR., Colonel, USAF
Commander
USAF Occupational Measurement Center

WALTER E. DRISKILL, Ph.D.
Chief, Occupational Survey Branch
USAF Occupational Measurement Center

ELECTRONIC PRINCIPLES OCCUPATIONAL SURVEY REPORT
PRECISION PHOTOGRAPHIC SYSTEMS CAREER LADDER
AFSC 404X0

INTRODUCTION

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned to Precision Photographic Systems Specialty (AFSC 404X0). The data for this report were collected during the period July through October 1976.

This report describes: (1) development and administration of the survey instrument; and (2) electronic principles used by DAFSC 5-skill level personnel both CONUS and overseas and assigned to selected major commands.

DEVELOPMENT OF THE ELECTRONIC PRINCIPLES INVENTORY (EPI)

The EPI was developed by personnel from the Occupational Survey Branch who were well qualified in theoretical physics and electronics, as well as in task analysis and survey development. Over 300 maintenance personnel from SAC, TAC, ADC, MAC, and AFCS participated in the development of the inventory. Representing the five ATC training centers, electronics experts who averaged 12 years of maintenance experience and four years of electronic principles instruction experience spent several weeks refining the EPI. In addition, personnel at the Electrical Engineering Department of the USAF Academy and the Air Force Human Resources Laboratory were consulted during the development of the inventory.

The final version of the EPI used in this survey contained 1,257 items in 62 subject matter areas covering all electronic principles training given at the five ATC technical training centers. Table 1 lists the 62 subject areas.

ADMINISTRATION

The Electronic Principles Inventory was administered by mail to AFSC 404X0 airmen worldwide. Responses from 252 individuals represented 68 percent of the total of all AFSC 404X0 personnel. Table 2 shows the percentage distribution by major command of the survey incumbents.

TABLE 1
EPI SUBJECT AREAS

<u>SEQUENCE OF SUBJECT AREAS</u>	<u>SUBJECT AREA TITLE</u>	<u>BEGINNING ITEM NUMBER</u>	<u>GPSUM PAGE NUMBER</u>
1	MATHEMATICS	A1	2
2	DIRECT CURRENT AND VOLTAGE	A15	2
3	RESISTANCE	A24	2
4	MULTIMETER USES	B52	3
5	ALTERNATING CURRENT	B61	4
6	INDUCTORS AND INDUCTIVE REACTANCE	B67	4
7	CAPACITORS AND CAPACITIVE REACTANCE	C92	5
8	TRANSFORMERS	C128	6
9	MAGNETISM	C171	7
10	RCL CIRCUITS	D185	8
11	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)	D229	9
12	FILTERS	D239	10
13	COUPLING	E261	11
14	SOLDERING	E273	12
15	RELAYS	E294	12
16	MICROPHONES	F314	13
17	SPEAKERS	F327	13
18	OSCILLOSCOPES	F342	13
19	SEMICONDUCTOR DIODES	G354	14
20	TRANSISTORS	G404	16
21	TRANSISTOR AMPLIFIERS	G428	17
22	SOLID-STATE SPECIAL PURPOSE DEVICES	H477	19
23	POWER SUPPLIES	H483	19
24	OSCILLATORS	H512	20
25	MULTIVIBRATORS	I539	21
26	LIMITERS AND CLAMPERS	I555	21
27	ELECTRON TUBES	I565	21
28	ELECTRON TUBE AMPLIFIERS AND CIRCUITS	J609	23
29	SPECIAL PURPOSE ELECTRON TUBES	J616	23
30	HETERODYNING, MODULATION, AND DEMODULATION	J632	24
31	AM SYSTEMS	K638	24
32	FM SYSTEMS	K666	25

TABLE 1 (CONTINUED)

EPI SUBJECT AREAS

<u>SEQUENCE OF SUBJECT AREAS</u>	<u>SUBJECT AREA TITLE</u>	<u>BEGINNING ITEM NUMBER-</u>	<u>GPSUM PAGE NUMBER</u>
33	NUMBERING SYSTEMS	K685	25
34	LOGIC FUNCTIONS	L695	26
35	BOOLEAN EQUATIONS	L708	26
36	COUNTERS	L733	27
37	TIMING CIRCUITS	M757	28
38	USE OF SIGNAL GENERATORS	M769	28
39	MOTORS AND GENERATORS	M779	29
40	METER MOVEMENTS	N808	29
41	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS	N818	30
42	WAVESHAPING CIRCUITS	N834	30
43	SINGLE SIDEBAND SYSTEMS	O845	31
44	PULSE MODULATION SYSTEMS	O875	32
45	ANTENNAS	O914	33
46	TRANSMISSION LINES	P953	34
47	WAVEGUIDES AND CAVITY RESONATORS	P984	36
48	MICROWAVE AMPLIFIERS AND OSCILLATORS	P1034	37
49	REGISTERS	Q1110	40
50	STORAGE DEVICES	Q1117	40
51	DIGITAL TO ANALOG CONVERTERS	Q1126	40
52	PHANTASTRONS	Q1140	41
53	SCHMITT TRIGGERS	R1141	41
54	CABLE FABRICATION	R1144	41
55	INPUT/OUTPUT DEVICES	S1146	41
56	PHOTO SENSITIVE DEVICES	S1149	41
57	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)	S1150	41
58	INFRARED	T1159	42
59	LASERS	T1186	42
60	DISPLAY TUBES	T1220	43
61	PROGRAMMING	U1234	44
62	DB AND POWER RATIOS	U1255	44

TABLE 2
COMMAND REPRESENTATION OF SURVEY SAMPLE

COMMAND	PERCENT ASSIGNED	404X0	PERCENT OF SAMPLE
TAC	29		31
SAC	19		20
MAC	17		20
USAFE	15		12
ATC	7		6
AFSC	4		4
OTHERS	9		7
TOTAL	100		100

Total Assigned - 369
 Total Sampled - 252
 Percent Sampled - 68%

PRESENTATION OF RESULTS

Personnel responded "yes" or "no" to the 1,257 electronic principles questions as related to their present job. A Group Summary (GPSUM) computer printout is provided in the Appendix portion of this report. Page 1 of the GPSUM lists the seven selected groups identified for this report. Pages 2-44 show the percentage of the incumbents responding to the EPI items. The computer program results display the percent members answering "yes" to the subject area questions. The reader can locate a specific subject area by referring to the Appendix page number as listed in Table 1. For example, the Transformers area results are given on page 6 of the GPSUM. The percentage of survey respondents indicating use of specific electronic principles ranged from high in areas such as Resistance (pp. 3-4) and Soldering (p. 12) to low in areas such as AM and FM Systems (pp. 24-25). Additional AFSC 404X0 data can be obtained upon request to the Chief, Occupational Survey Branch (OMY).

APPENDIX

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

Task ID	Description	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
A 1	AI-01 DO YOU USE AN INSTRUMENT, SUCH AS METER OR AN OSCILLOSCOPE, IN WHICH IT IS NECESSARY TO AMPLIFY OR	51	55	39	52	59	47	43
A 2	AI-02 DO YOU USE A PUBLICATION, SUCH AS A TECHNICAL ORDER OR MAINTENANCE MANUAL, IN WHICH IT IS NECESSARY	26	28	19	34	22	25	14
A 3	AI-03 DO YOU REARRANGE AND SOLVE FORMULAS OR EQUATIONS.	17	20	8	18	22	11	5
A 4	AI-04 DO YOU FIND THE SQUARE ROOT OF A QUANTITY.	4	5	3	2	11	3	5
A 5	AI-05 DO YOU SOLVE FOR AN UNKNOWN QUANTITY.	15	17	11	13	19	6	14
A 6	AI-06 DO YOU CONVERT NUMBERS TO LOGARITHMS.	2	2	3	0	3	0	5
A 7	AI-07 DO YOU USE LOGARITHM TABLES IN ANY TYPE OF CALCULATIONS.	2	2	3	0	5	0	5
A 8	AI-08 DO YOU SOLVE QUADRATIC EQUATIONS.	3	5	0	2	5	0	0
A 9	AI-09 DO YOU USE THE NATURAL SYSTEM OF LOGARITHMS (THIS IS THE LOGARITHM SYSTEM WHICH USES THE NUMBER 2.718 AS	3	5	0	2	8	3	0
A 10	AI-10 DO YOU WORK WITH VECTOR QUANTITIES, SUCH AS ADDING OR SUBTRACTING TWO VECTORS.	3	3	3	0	3	3	5
A 11	AI-11 DO YOU WORK WITH TRIGONOMETRIC FUNCTIONS SUCH AS SINE, COSINE, OR TANGENT.	3	3	3	0	5	0	5
A 12	AI-12 DO YOU DETERMINE AREAS OF PLANE FIGURES, SUCH AS AREAS OF CIRCLES OR TRIANGLES.	13	15	8	7	19	11	10
A 13	AI-13 DO YOU SOLVE OR USE SIMULTANEOUS EQUATIONS.	4	5	3	0	11	0	5
A 14	AI-14 DO YOU SOLVE OR USE PROPORTIONS.	9	10	11	5	14	0	14
A 15	AZ-01 DO YOU USE THE TERM VOLTAGE OR VOLT.	87	86	97	84	92	75	95
A 16	AZ-02 DO YOU USE THE TERM ELECTROMOTIVE FORCE (EMF).	31	32	28	32	30	19	38
A 17	AZ-03 DO YOU USE THE TERM OHM.	87	87	94	88	89	75	90
A 18	AZ-04 DO YOU USE THE TERM ION.	14	14	19	7	16	6	24
A 19	AZ-05 DO YOU USE THE TERM DYNE.	6	5	6	2	8	6	5
A 20	AZ-06 DO YOU USE THE TERM AMPERE.	83	84	89	84	86	69	81
A 21	AZ-07 DO YOU USE THE TERM AMPERE.	13	15	6	11	14	6	10
A 22	AZ-08 DO YOU USE THE TERM NEUTRON.	7	9	3	5	5	8	5
A 23	AZ-09 DO YOU USE THE TERM PROTON.	12	13	8	11	14	6	14
A 24	A3-01 DO YOU WORK WITH RESISTORS IN YOUR PRESENT JOB.	73	72	83	70	65	67	81
A 25	A3-02 DO YOU INSPECT RESISTORS.	79	78	86	79	81	67	81
A 26	A3-03 DO YOU CLEAN RESISTORS.	56	59	50	55	68	42	48
A 27	A3-04 DO YOU ADJUST RESISTORS.	61	61	67	57	73	44	67
A 28	A3-05 DO YOU CHECK OHMIC VALUE OF RESISTORS.	77	78	86	79	76	64	81
A 29	A3-06 DO YOU REMOVE OR REPLACE RESISTORS.	77	78	86	79	73	67	86
A 30	A3-07 DO YOU USE OR REFER TO TEMPERATURE COEFFICIENTS FOR RESISTORS ON ANY TASKS IN YOUR PRESENT JOB.	22	24	19	23	19	14	24
A 31	A3-08 DO YOU USE OR REFER TO RESISTOR SYMBOLS, SUCH AS FOR FIXED RESISTORS OR FOR TAPPED RESISTORS.	62	64	67	59	65	50	48
A 32	A3-09 DO YOU IDENTIFY OR CLASSIFY THE RESISTORS YOU WORK WITH AS CARBON, FILLED WIRE, SLIDE TAP, RHEOSTAT OR	65	68	61	68	62	53	52

DIRECT CURRENT
AND VOLTAGE

RESISTANCE

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DIY-TSK	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
A 33 A3-10 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE THE OHMIC VALUE OF RESISTANCE.	74	78	75	71	81	64	71
A 34 A3-11 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE THE TOLERANCE OF RESISTORS.	65	68	67	59	65	64	67
A 35 A3-12 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE THE FAILURE RATE OF RESISTORS.	19	23	8	25	27	6	10
A 36 A3-13 DO YOU MAKE DECISIONS IN WHICH YOU MUST DETERMINE HOW TWO OR MORE BATTERIES MUST BE CONNECTED TOGETHER TO REPRESENT ANY OF THE FOLLOWING COMPONENTS: BATTERY, RESISTIVE CIRCUITS.	37	39	25	36	54	19	29
A 37 A3-14 DO YOU USE OR REFER TO THE SCHEMATIC SYMBOLS WHICH REPRESENT ANY OF THE FOLLOWING COMPONENTS: BATTERY, RESISTIVE CIRCUITS.	83	82	92	82	78	72	90
A 38 A3-15 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES RESISTIVE CIRCUITS.	42	45	36	43	43	33	38
A 39 A3-16 DO YOU CALCULATE TOTAL CURRENT FOR SERIES RESISTIVE CIRCUITS.	41	45	33	43	43	31	38
A 40 A3-17 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES RESISTIVE CIRCUITS.	38	41	31	36	38	33	33
A 41 A3-18 DO YOU CALCULATE POWER DISSIPATION FOR SERIES RESISTIVE CIRCUITS.	30	32	28	30	32	17	29
A 42 A3-19 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES PARALLEL RESISTIVE CIRCUITS.	39	40	36	41	38	25	38
A 43 A3-20 DO YOU CALCULATE TOTAL CURRENT FOR SERIES PARALLEL RESISTIVE CIRCUITS.	38	40	33	39	38	25	38
A 44 A3-21 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	37	40	31	39	35	25	33
A 45 A3-22 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	34	35	33	36	32	19	38
A 46 A3-23 DO YOU CALCULATE POWER DISSIPATION FOR SERIES PARALLEL RESISTIVE CIRCUITS.	29	30	28	32	30	11	29
A 47 A3-24 DO YOU CALCULATE TOTAL RESISTANCE FOR PARALLEL RESISTIVE CIRCUITS.	35	38	31	41	30	22	38
A 48 A3-25 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RESISTIVE CIRCUITS.	34	37	28	38	30	22	38
A 49 A3-26 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR PARALLEL RESISTIVE CIRCUITS.	33	37	25	38	27	25	33
A 50 A3-27 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR PARALLEL RESISTIVE CIRCUITS.	29	32	25	34	24	19	33
A 51 A3-28 DO YOU CALCULATE POWER DISSIPATION FOR PARALLEL RESISTIVE CIRCUITS.	24	27	19	30	22	11	24
B 52 B1-01 DO YOU MEASURE RESISTANCE.	91	92	94	95	84	89	90
B 53 B1-02 DO YOU REPAIR AN OHMMETER.	7	7	11	9	5	3	14
B 54 B1-03 DO YOU MEASURE VOLTAGE.	92	92	94	95	81	94	95
B 55 B1-04 DO YOU REPAIR A VOLTMETER.	2	2	6	0	5	0	5
B 56 B1-05 DO YOU REPAIR AN AMPMETER.	2	2	3	2	5	0	0
B 57 B1-06 DO YOU MEASURE CURRENT.	77	78	78	82	68	64	76
B 58 B1-07 DO YOU USE A MULTIMETER.	91	91	92	93	81	97	86

MULTIMETER USES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
B 88 B3-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTIVE REACTANCE IS DIRECTLY PROPORTIONAL TO	6	7	6	11	8	0	5
B 89 B3-23 DO YOU WORK WITH POWER INDUCTORS.	13	15	11	20	14	0	5
B 90 B3-24 DO YOU WORK WITH AUDIO FREQUENCY INDUCTORS.	7	9	0	9	5	0	0
B 91 B3-25 DO YOU WORK WITH RADIO FREQUENCY INDUCTORS.	2	2	3	0	5	0	0
C 92 C1-01 DO YOU WORK WITH CAPACITORS OR CIRCUITS CONTAINING CAPACITORS ON YOUR PRESENT JOB.	72	75	67	66	61	69	57
C 93 C1-02 DO YOU INSPECT CAPACITORS.	66	70	53	70	73	58	38
C 94 C1-03 DO YOU CLEAN CAPACITORS.	41	46	25	38	57	33	19
C 95 C1-04 DO YOU ADJUST CAPACITORS.	17	21	8	16	32	6	10
C 96 C1-05 DO YOU TEST CAPACITORS.	65	70	50	64	73	58	43
C 97 C1-06 DO YOU DISCHARGE CAPACITORS.	69	74	53	63	84	64	43
C 98 C1-07 DO YOU REMOVE OR REPLACE CAPACITORS.	71	74	61	70	81	61	52
C 99 C1-08 DO YOU USE OR REFER TO DISTRIBUTED CAPACITANCE.	9	11	6	5	11	8	10
C 100 C1-09 DO YOU USE OR REFER TO ORBITAL STRESS OF ELECTRONS IN A DIELECTRIC.	2	3	0	2	8	0	0
C 101 C1-10 DO YOU USE OR REFER TO FARADS, MICROFARADS, OR PICOFARADS.	36	41	28	29	35	39	19
C 102 C1-11 DO YOU USE OR REFER TO CAPACITANCE.	44	45	47	43	38	39	43
C 103 C1-12 DO YOU USE OR REFER TO DIELECTRIC CONSTANT.	4	5	0	7	8	0	0
C 104 C1-13 DO YOU USE OR REFER TO WORKING VOLTAGE RATING OF CAPACITORS.	38	42	28	39	38	31	19
C 105 C1-14 DO YOU USE OR REFER TO CAPACITIVE REACTANCE.	23	28	11	29	24	17	5
C 106 C1-15 DO YOU USE OR REFER TO CAPACITOR COLOR CODES.	25	29	17	25	27	14	10
C 107 C1-16 THE CAPACITORS YOU WORK WITH IN DC CIRCUITS.	61	62	61	61	68	50	52
C 108 C1-17 THE CAPACITORS YOU WORK WITH ARE IN AC CIRCUITS.	69	71	61	66	76	61	48
C 109 C1-18 THE CAPACITORS YOU WORK WITH ARE IN CIRCUITS WITH BOTH DC AND AC.	50	48	56	50	54	36	48
C 110 C1-19 THE CAPACITORS YOU WORK WITH ARE DON'T REMEMBER WHICH CIRCUITS.	18	19	14	14	22	22	14
C 111 C1-20 DO YOU CALCULATE CAPACITANCE FOR A PARTICULAR CAPACITOR USING FORMULAS.	9	12	0	11	14	6	0
C 112 C1-21 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE CAPACITANCE OF A CAPACITOR IS DIRECTLY PROPORTIONAL	4	5	0	5	11	0	0
C 113 C1-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE CAPACITANCE OF A CAPACITOR IS INVERSELY PROPORTIONAL	4	4	0	4	11	0	0
C 114 C1-23 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES.	15	15	11	18	11	19	10
C 115 C1-24 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN PARALLEL.	14	15	11	14	11	19	10
C 116 C1-25 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES-PARALLEL CIRCUITS.	13	14	11	16	11	14	10
C 117 C1-26 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT DOES NOT FLOW THROUGH CAPACITORS, IT ONLY	13	16	3	13	16	11	5

CAPACITORS AND
CAPACITIVE
REACTANCE

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

SPC 003 007 008 009 010 011 012

Item	Description	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
C 118	CI-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LEADS VOLTAGE IN AC CAPACITOR CIRCUITS.	16	17	8	13	19	11	10
C 119	CI-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITIVE REACTANCE IS INVERSELY PROPORTIONAL TO CAPACITANCE.	9	9	6	11	11	3	10
C 120	CI-29 DO YOU CALCULATE CAPACITIVE REACTANCE.	10	12	8	18	11	3	10
C 121	CI-30 DO YOU WORK WITH ROTOR-STATOR CAPACITORS (VARIABLE).	18	19	11	14	24	8	10
C 122	CI-31 DO YOU WORK WITH COMPRESSION (TRIMMER) CAPACITORS.	10	10	6	4	16	8	5
C 123	CI-32 DO YOU WORK WITH ELECTROLYTIC CAPACITORS (FIXED).	48	49	39	39	49	44	29
C 124	CI-33 DO YOU WORK WITH PAPER CAPACITORS (FIXED).	38	43	25	41	30	28	14
C 125	CI-34 DO YOU WORK WITH MICA CAPACITORS (FIXED).	33	35	22	25	32	31	19
C 126	CI-35 DO YOU WORK WITH CERAMIC CAPACITORS (FIXED).	44	48	31	46	41	36	19
C 127	CI-36 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF CAPACITORS.	26	28	22	27	46	17	29
C 128	C2-01 DO YOU WORK WITH TRANSFORMERS ON YOUR PRESENT JOB.	51	55	39	43	51	53	33
C 129	C2-02 DO YOU INSPECT TRANSFORMERS.	52	58	33	48	51	50	29
C 130	C2-03 DO YOU CLEAN TRANSFORMERS.	43	48	25	45	46	36	19
C 131	C2-04 DO YOU ADJUST TRANSFORMERS.	24	27	17	23	38	8	10
C 132	C2-05 DO YOU TROUBLESHOOT TRANSFORMERS.	43	46	33	36	51	39	29
C 133	C2-06 DO YOU REMOVE OR REPLACE COMPLETE TRANSFORMERS.	52	58	36	48	51	50	33
C 134	C2-07 DO YOU REMOVE OR REPLACE TRANSFORMER PARTS, SUCH AS THE PRIMARY WINDING.	9	11	3	7	22	6	5
C 135	C2-08 DO YOU MAKE A DISTINCTION BETWEEN MUTUAL INDUCTION AND MUTUAL INDUCTANCE (M).	4	5	3	2	8	6	5
C 136	C2-09 DO YOU USE THE SYMBOL FOR MUTUAL INDUCTANCE, M.	4	5	0	5	8	0	0
C 137	C2-10 DO YOU REFER TO OR USE THE COEFFICIENT OF COUPLING WHEN WORKING WITH TRANSFORMERS.	6	5	6	4	11	3	5
C 138	C2-11 DO YOU CALCULATE TURNS RATIOS FOR TRANSFORMERS USING CURRENT OR VOLTAGE RATIOS.	8	8	6	7	11	6	10
C 139	C2-12 DO YOU REFER TO REFLECTED IMPEDANCE WHEN WORKING WITH TRANSFORMERS.	4	5	0	2	8	6	0
C 140	C2-13 DO YOU CALCULATE IMPEDANCE INTERACTIONS FOR TRANSFORMERS.	3	4	0	4	8	3	0
C 141	C2-14 DO YOU WORK WITH AUTOTRANSFORMERS.	15	15	17	13	14	11	5
C 142	C2-15 DO YOU WORK WITH POWER TRANSFORMERS.	48	52	36	41	46	50	29
C 143	C2-16 DO YOU WORK WITH AUDIO TRANSFORMERS.	12	12	0	7	19	8	0
C 144	C2-17 DO YOU WORK WITH RADIO FREQUENCY TRANSFORMERS.	3	3	0	4	11	0	0
C 145	C2-18 DO YOU WORK WITH DON'T REMEMBER WHAT TYPE OF TRANSFORMER.	22	26	11	23	32	17	10
C 146	C2-19 DO YOU CHECK TRANSFORMERS FOR OPEN WINDINGS BY MEASURING RESISTANCE.	45	50	28	45	49	39	24
C 147	C2-20 DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING RESISTANCE.	45	49	31	45	46	36	29
C 148	C2-21 DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING OUTPUT VOLTAGES.	40	44	31	39	43	36	24
C 149	C2-22 DO YOU MEASURE RESISTANCE OF TRANSFORMER WINDINGS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR	17	19	6	16	22	14	5

TRANSFORMERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	SPC U03	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
C 150 C2-23 DO YOU MEASURE OUTPUT VOLTAGE OF TRANSFORMERS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR STEP-DOWN SYMBOLS FOR TRANSFORMERS.	26	26	22	21	24	31	19
C 151 C2-24 DO YOU REFER TO THE BASIC TRANSFORMER SCHEMATIC SYMBOLS FOR TRANSFORMERS.	47	50	36	41	41	47	29
C 152 C2-25 DO YOU REFER TO THE MULTIPLE SECONDARY-WINDINGS SCHEMATIC SYMBOLS FOR TRANSFORMERS.	34	36	28	29	32	28	19
C 153 C2-26 DO YOU REFER TO THE MULTIPLE TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS.	34	38	22	27	35	31	14
C 154 C2-27 DO YOU REFER TO THE CENTER TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS.	37	41	25	34	38	31	19
C 155 C2-28 DO YOU REFER TO THE AIR CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS.	20	21	17	20	22	17	5
C 156 C2-29 DO YOU REFER TO THE IRON CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS.	24	26	17	20	24	28	5
C 157 C2-30 DO YOU REFER TO THE COMBINATIONS OF THE ABOVE SCHEMATIC SYMBOLS FOR TRANSFORMERS.	28	30	25	27	27	25	19
C 158 C2-31 DO YOU DETERMINE PHASE RELATIONSHIPS BETWEEN SECONDARY AND PRIMARY VOLTAGES OF TRANSFORMERS USING TRANSFORMERS YOU WORK WITH.	15	15	11	14	19	17	10
C 159 C2-32 DO YOU DETERMINE OR REFER TO THE TYPE OF CORE IN TRANSFORMERS YOU WORK WITH.	14	15	6	11	19	17	5
C 160 C2-33 DO YOU REFER TO OR USE THE GENERAL RULE THAT THE TURNS RATIO OF A TRANSFORMER IS EQUAL TO THE VOLTAGE RATIOS FOR TRANSFORMERS.	10	12	3	9	22	6	0
C 161 C2-34 DO YOU USE OR REFER TO STEP-UP OR STEP-DOWN RATIOS FOR TRANSFORMERS.	16	16	14	13	22	11	10
C 162 C2-35 DO YOU CALCULATE VOLTAGE RATIOS FOR TRANSFORMERS USING TURNS RATIOS.	6	6	0	2	14	6	0
C 163 C2-36 DO YOU CALCULATE CURRENT RATIOS FOR TRANSFORMERS USING TURNS RATIOS.	6	6	0	4	14	3	0
C 164 C2-37 DOES YOUR JOB INVOLVE ANY TASKS DEALING WITH 3 PHASE TRANSFORMERS.	12	14	6	11	22	6	5
C 165 C2-38 DO YOU INSPECT 3 PHASE TRANSFORMERS.	12	12	11	11	19	3	14
C 166 C2-39 DO YOU CLEAN OR LUBRICATE 3 PHASE TRANSFORMERS.	8	8	8	5	14	3	14
C 167 C2-40 DO YOU ADJUST 3 PHASE TRANSFORMERS.	6	5	6	5	11	0	10
C 168 C2-41 DO YOU TROUBLESHOOT 3 PHASE TRANSFORMERS.	10	9	8	11	14	3	10
C 169 C2-42 DO YOU REMOVE OR REPLACE COMPLETE 3 PHASE TRANSFORMER.	11	11	8	13	14	3	10
C 170 C2-43 DO YOU REMOVE OR REPLACE 3 PHASE TRANSFORMER PARTS, SUCH AS A WINDING.	5	5	3	4	11	0	5
C 171 C3-01 DO YOU USE OR REFER TO PERMANENT MAGNETS.	28	32	19	29	32	19	24
C 172 C3-02 DO YOU USE OR REFER TO TEMPORARY MAGNETS.	20	24	11	23	22	17	14
C 173 C3-03 DO YOU USE OR REFER TO RETENTIVITY OF MAGNETIC MATERIALS.	8	8	3	7	14	6	0
C 174 C3-04 DO YOU USE OR REFER TO RELUCTANCE OF MAGNETIC MATERIALS.	6	5	3	5	14	3	0

MAGNETISM

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

SPC 003 SPC 007 SPC 008 SPC 009 SPC 010 SPC 011 SPC 012

C 175	C3-05	DO YOU USE OR REFER TO PERMEABILITY OF MAGNETIC MATERIALS.	7	8	3	7	14	3	0
C 176	C3-06	DO YOU USE OR REFER TO RESIDUAL MAGNETISM.	7	7	6	5	16	3	5
C 177	C3-07	DO YOU USE OR REFER TO MAGNETIC LINES OF FORCE OR FLUX.	12	12	11	13	14	6	14
C 178	C3-09	DO YOU USE OR REFER TO WEBER'S THEORY OF MAGNETISM.	4	4	3	4	11	0	0
C 179	C3-09	DO YOU USE OR REFER TO THE DOMAIN THEORY OF MAGNETISM.	4	4	3	4	11	0	0
C 180	C3-10	DO YOU USE OR REFER TO MAGNETIC INDUCTION.	8	8	8	9	11	3	5
C 181	C3-11	DO YOU USE OR REFER TO FLUX DENSITY.	6	6	3	5	14	3	0
C 182	C3-12	DO YOU USE OR REFER TO THE GENERAL RULE THAT FOR MAGNETIC POLES, LIKE POLES REPEL AND UNLIKE POLES ATTRACT.	39	38	42	30	38	33	43
C 183	C3-13	DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE DIRECTION OF MAGNETIC FIELDS ABOUT STRAIGHT WIRES.	22	22	19	21	30	17	19
C 184	C3-14	DO YOU USE THE LEFT THUMB RULE TO FIND THE NORTH POLE OF A CURRENT CARRYING COIL.	19	18	17	18	30	11	14
C 185	D1-01	DO YOU WORK WITH RC, LR, OR RCL CIRCUITS ON YOUR PRESENT JOB.	12	13	6	16	11	6	5
D 186	D1-02	DO YOU USE OR REFER TO VECTORS WHEN WORKING WITH RCL CIRCUITS.	3	3	3	2	8	3	5
D 187	D1-03	DO YOU USE OR REFER TO PYTHAGOREAN THEOREM WHEN WORKING WITH RCL CIRCUITS.	2	2	0	2	8	0	0
D 188	D1-04	DO YOU USE OR REFER TO SINE WHEN WORKING WITH RCL CIRCUITS.	3	3	3	2	8	0	5
D 189	D1-05	DO YOU USE OR REFER TO COSINE WHEN WORKING WITH RCL CIRCUITS.	3	2	3	0	8	0	5
D 190	D1-06	DO YOU USE OR REFER TO TANGENT WHEN WORKING WITH RCL CIRCUITS.	2	2	3	0	8	0	5
D 191	D1-07	DO YOU USE OR REFER TO WATTS WHEN WORKING WITH RCL CIRCUITS.	8	8	3	9	8	3	5
D 192	D1-08	DO YOU USE OR REFER TO TRUE POWER (PT) WHEN WORKING WITH RCL CIRCUITS.	3	2	3	0	8	0	5
D 193	D1-09	DO YOU USE OR REFER TO MAXIMUM POWER (PM) WHEN WORKING WITH RCL CIRCUITS.	4	4	3	0	8	3	5
D 194	D1-10	DO YOU USE OR REFER TO AVERAGE POWER (PAVE) WHEN WORKING WITH RCL CIRCUITS.	4	5	3	0	8	3	5
D 195	D1-11	DO YOU USE OR REFER TO APPARENT POWER (PA) WHEN WORKING WITH RCL CIRCUITS.	3	3	3	2	8	3	5
D 196	D1-12	DO YOU USE OR REFER TO POWER FACTOR (PF) WHEN WORKING WITH RCL CIRCUITS.	3	2	3	0	8	0	5
D 197	D1-13	DO YOU USE OR REFER TO RESONANT CIRCUITS WHEN WORKING WITH RCL CIRCUITS.	5	5	3	7	8	0	5
D 198	D1-14	DO YOU USE OR REFER TO BANDWIDTH WHEN WORKING WITH RCL CIRCUITS.	3	2	3	4	5	0	5
D 199	D1-15	DO YOU USE OR REFER TO SELECTIVITY WHEN WORKING WITH RCL CIRCUITS.	5	5	3	5	8	0	5

RCL CIRCUITS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DI	DESCRIPTION	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
D 200	DI-16 DO YOU USE OR REFER TO RESONANT FREQUENCY WHEN WORKING WITH RCL CIRCUITS.	4	3	3	4	8	0	5
D 201	DI-17 DO YOU USE OR REFER TO HALF POWER POINTS WHEN WORKING WITH RCL CIRCUITS.	2	1	3	0	5	0	5
D 202	DI-18 DO YOU USE OR REFER TO BRANDPASS REGION WHEN WORKING WITH RCL CIRCUITS.	2	1	3	0	5	0	5
D 203	DI-19 DO YOU USE OR REFER TO CIRCUIT Q WHEN WORKING WITH RCL CIRCUITS.	2	2	0	0	5	3	0
D 204	DI-20 DO YOU USE OR REFER TO TANK CIRCUITS WHEN WORKING WITH RCL CIRCUITS.	6	6	3	9	5	3	5
D 205	DI-21 DO YOU DETERMINE VALUES OF TRIGONOMETRIC FUNCTIONS USING FORMULAS: SINE OF AN ANGLE = OPPOSITE SIDE	2	2	0	0	8	3	0
D 206	DI-22 DO YOU DRAW VOLTAGE, CURRENT, OR IMPEDANCE VECTOR DIAGRAMS FOR CIRCUITS.	4	4	3	4	8	3	5
D 207	DI-23 DO YOU CALCULATE TOTAL IMPEDANCE FOR CAPACITIVE CIRCUITS.	5	5	3	5	11	3	5
D 208	DI-24 DO YOU CALCULATE PHASE ANGLES BETWEEN IMPEDANCE AND RESISTANCE IN CAPACITIVE CIRCUITS.	2	2	3	0	8	0	5
D 209	DI-25 DO YOU CALCULATE TOTAL IMPEDANCE FOR SERIES RCL CIRCUITS.	5	5	3	5	11	3	5
D 210	DI-26 DO YOU CALCULATE IMPEDANCE ANGLES FOR SERIES RCL CIRCUITS.	2	2	3	0	8	0	5
D 211	DI-27 DO YOU CALCULATE APPARENT POWER (PA) FOR SERIES RCL CIRCUITS.	3	2	3	0	8	3	5
D 212	DI-28 DO YOU CALCULATE TRUE POWER (PT) FOR SERIES RCL CIRCUITS.	2	2	3	0	8	0	5
D 213	DI-29 DO YOU CALCULATE POWER FACTORS (PF) FOR SERIES RCL CIRCUITS.	3	2	6	0	8	0	5
D 214	DI-30 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RCL CIRCUITS.	6	5	6	7	8	3	5
D 215	DI-31 DO YOU CALCULATE IMPEDANCE ANGLES FOR PARALLEL RCL CIRCUITS.	2	2	0	0	8	0	0
D 216	DI-32 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING THE ASSUMED VOLTAGE METHOD.	2	2	0	0	8	3	0
D 217	DI-33 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING OHM'S LAW.	4	4	3	4	8	3	5
D 218	DI-34 DO YOU CHECK CAPACITORS USING OHMMETERS.	15	17	8	21	16	6	0
D 219	DI-35 DO YOU CHECK CAPACITORS USING SUBSTITUTION.	9	11	6	11	11	8	5
D 220	DI-36 DO YOU CHECK INDUCTORS USING OHMMETERS.	12	13	6	16	16	0	0
D 221	DI-37 DO YOU CHECK INDUCTORS USING SUBSTITUTION.	8	8	6	9	11	3	5
D 222	DI-38 DO YOU USE OR REFER TO THE GENERAL RULE THAT $\theta = \theta_0$, $PF=1$, AND $PA=PT$ FOR RESONANT CIRCUITS.	2	2	0	0	8	0	0
D 223	DI-39 DO YOU CALCULATE RESONANT FREQUENCIES FOR RCL CIRCUITS.	3	2	3	2	8	0	5
D 224	DI-40 DO YOU USE OR REFER TO THE GENERAL RULE THAT IMPEDANCE IS MINIMUM AND CURRENT MAXIMUM AT THE	2	2	0	0	8	0	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DIAGNOSTIC	DESCRIPTION	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
D 225	01-41 DO YOU USE OR REFER TO THE GENERAL RULE THAT LINE CURRENT IS MINIMUM AND IMPEDANCE MAXIMUM AT	2	2	0	0	8	0	0
D 226	01-42 DO YOU USE OR REFER TO THE GENERAL RULE THAT HALF POWER POINTS ARE AT 70.7 PERCENT OF THE PEAK	3	2	6	2	8	0	5
D 227	01-43 DO YOU USE OR REFER TO THE GENERAL RULE THAT BANDWIDTH IS INVERSELY PROPORTIONAL TO Q.	2	2	3	0	8	0	0
D 228	01-44 DO YOU DETERMINE HOW CHANGES IN FREQUENCY, RESISTANCE, CAPACITANCE, OR INDUCTANCE WILL AFFECT	2	2	3	0	8	0	5
D 229	02-01 IN YOUR PRESENT JOB, DO YOU WORK WITH, USE, OR REFER TO SERIES OR PARALLEL RESONANCE CIRCUITS OR	6	8	0	7	8	6	0
D 230	02-02 DO YOU WORK WITH, USE, OR REFER TO TIME CONSTANTS.	5	6	0	4	8	6	0
D 231	02-03 DO YOU WORK WITH, USE, OR REFER TO AVAILABLE VOLTAGE.	4	5	0	4	8	0	0
D 232	02-04 DO YOU WORK WITH, USE, OR REFER TO TRANSIENT INTERVALS.	3	4	0	4	8	0	0
D 233	02-05 DO YOU USE OR REFER TO THE GENERAL RULE THAT A CAPACITOR IS FULLY CHARGED (OR DISCHARGED) AFTER FIVE	6	7	0	7	8	3	0
D 234	02-06 DO YOU USE OR REFER TO UNIVERSAL TIME CONSTANT CHARTS.	3	4	0	0	8	3	0
D 235	02-07 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CIRCUITS CURRENT OR COMPONENT VOLTAGES AFTER A	2	2	0	0	8	0	0
D 236	02-08 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE THE TIME REQUIRED FOR CIRCUIT CURRENT OR COMPONENT	2	2	0	0	8	0	0
D 237	02-09 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE COMPONENT VALUES REQUIRED FOR CIRCUIT CURRENT AND	3	3	0	4	6	0	0
D 238	02-10 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT IN LR CIRCUITS REACHES ITS MINIMUM VALUE (OR	3	3	0	2	8	0	0
D 239	03-01 DO YOU WORK WITH CIRCUITS USED AS FILTERS ON YOUR PRESENT JOB.	17	15	17	23	16	3	10
D 240	03-02 DO YOU INSPECT FILTER CIRCUITS.	15	15	11	23	11	3	10
D 241	03-03 DO YOU CLEAN FILTER CIRCUITS.	10	9	11	11	14	0	10
D 242	03-04 DO YOU ALIGN OR ADJUST FILTER CIRCUITS.	10	10	8	13	14	0	5
D 243	03-05 DO YOU TROUBLESHOOT TO THE FILTER CIRCUIT.	12	10	17	13	11	3	10
D 244	03-06 DO YOU TROUBLESHOOT TO COMPONENT PARTS OF FILTER CIRCUITS.	11	9	14	14	11	3	10
D 245	03-07 DO YOU REMOVE OR REPLACE THE COMPLETE FILTER CIRCUIT.	13	13	14	16	14	3	10

FILTERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	SPC 003	SPC 007	SPC U08	SPC 009	SPC 010	SPC 011	SPC 012
D 246 03-08 DO YOU REMOVE OR REPLACE COMPONENT PARTS OF FILTER CIRCUITS.	12	11	14	16	14	3	10
D 247 03-09 DO YOU WORK ON LOW PASS FILTERS.	6	5	6	4	11	3	5
D 248 03-10 DO YOU WORK ON HIGH PASS FILTERS.	7	6	6	5	11	3	5
D 249 03-11 DO YOU WORK ON BANDPASS FILTERS.	4	4	3	4	11	0	5
D 251 03-13 DO YOU WORK ON DON'T REMEMBER WHICH TYPE OF FILTER	3	3	0	2	11	0	0
D 250 03-12 DO YOU WORK ON BAND-REJECT FILTERS.	10	13	3	18	14	0	0
D 252 03-14 DO YOU WORK WITH L-SECTION FILTER CONFIGURATIONS.	4	4	3	2	11	3	5
D 253 03-15 DO YOU WORK WITH T-SECTION FILTER CONFIGURATIONS.	3	4	0	2	11	3	0
D 254 03-16 DO YOU WORK WITH PI-SECTION FILTER CONFIGURATIONS.	3	4	0	2	11	3	0
D 255 03-17 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF FILTER CONFIGURATIONS.	10	12	6	14	14	0	0
D 256 03-18 ARE PARALLEL RESONANT CIRCUITS USED IN FILTERS YOU WORK WITH.	6	6	3	7	11	0	5
D 257 03-19 ARE SERIES-PARALLEL CIRCUITS USED IN FILTERS YOU WORK WITH.	8	8	6	9	14	3	5
D 258 03-20 ARE SERIES RESONANT CIRCUITS USED IN FILTERS YOU WORK WITH.	5	5	3	5	11	0	5
D 259 03-21 ARE DON'T REMEMBER WHICH TYPE OF BASIC CIRCUIT USED IN FILTERS YOU WORK WITH.	10	11	6	13	14	0	0
D 260 03-22 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CAPACITANCE OR INDUCTANCE VALUES REQUIRED FOR SPECIFIC JOB.	4	4	0	2	11	3	0
E 261 E1-01 DO YOU WORK WITH COUPLING DEVICES ON YOUR PRESENT JOB.	9	11	3	14	11	3	0
E 262 E1-02 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED TO THE ACTUAL CIRCUITRY.	7	8	0	9	11	3	0
E 263 E1-03 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED TO THE ACTUAL CIRCUITRY.	7	8	0	9	11	3	0
E 264 E1-04 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WHICH PERFORM THE RC COUPLING FUNCTIONS.	8	9	3	11	11	3	0
E 265 E1-05 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THE RC COUPLING FUNCTIONS.	6	8	0	9	11	3	0
E 266 E1-06 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THE IMPEDANCE COUPLING FUNCTIONS.	6	7	0	9	11	0	0
E 267 E1-07 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THE TRANSFORMER COUPLING FUNCTIONS.	7	8	3	9	11	3	0
E 268 E1-08 DO YOU WORK WITH DIRECTLY COUPLED CIRCUITS.	6	7	3	7	11	3	0
E 269 E1-09 DO YOU WORK WITH CAPACITIVE-RESISTIVE COUPLED CIRCUITS.	6	7	0	7	11	3	0
E 270 E1-10 DO YOU WORK WITH CAPACITIVE-INDUCTIVE COUPLED CIRCUITS.	5	6	0	7	11	0	0
E 271 E1-11 DO YOU WORK WITH TRANSFORMER COUPLED CIRCUITS.	6	6	3	5	11	3	0
E 272 E1-12 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF COUPLING CIRCUIT.	5	6	0	7	11	0	0

COUPLING

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DI-TSK	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
E 273 E2-01 ON YOUR PRESENT JOB DO YOU PERFORM SOLDERING TECHNIQUES OR INSPECT OR EVALUATE SOLDERED CONNECTIONS.	89	91	92	84	89	89	95
E 274 E2-02 DO YOU SELECT TYPE OF SOLDER TO USE.	85	85	89	60	89	86	86
E 275 E2-03 DO YOU ADD FLUX TO CONNECTIONS.	87	88	89	88	89	81	95
E 276 E2-04 DO YOU CLEAN CONNECTIONS USING SOLVENTS.	73	75	72	59	78	81	76
E 277 E2-05 DO YOU STRIP INSULATION FROM WIRES.	91	92	94	88	92	89	95
E 278 E2-06 DO YOU CONNECT OR DISCONNECT HEAT SINKS.	80	82	78	80	84	78	71
E 279 E2-07 DO YOU BEND OR SHAPE WIRES OR LEADS.	90	91	92	89	89	86	90
E 280 E2-08 DO YOU CUT WIRES.	91	92	94	89	92	89	95
E 281 E2-09 DO YOU FILE OR SHAPE SOLDERING IRON TIPS.	86	87	92	82	89	83	95
E 282 E2-10 DO YOU TIN SOLDERING IRON TIPS.	68	68	92	84	84	89	95
E 283 E2-11 DO YOU CLEAN SOLDERING IRON TIPS.	90	91	92	86	89	89	95
E 284 E2-12 DO YOU CLEAN ELECTRICAL SURFACES USING ERASERS.	51	52	53	39	73	42	43
E 285 E2-13 DO YOU TIN OR PRE-TIN CONDUCTORS.	70	72	69	66	78	53	71
E 286 E2-14 DO YOU INSPECT SOLDERED CONNECTIONS.	91	92	92	88	89	94	95
E 287 E2-15 DO YOU DESOLDER CONNECTIONS BY WICKING.	51	55	39	43	59	47	38
E 288 E2-16 DO YOU DESOLDER CONNECTIONS USING VACUUM DESOLDERING TOOLS.	33	32	36	23	38	31	33
E 289 E2-17 DO YOU CUT COMPONENT LEADS TO REMOVE COMPONENTS.	69	68	78	61	76	53	81
E 290 E2-18 DO YOU CRUSH COMPONENTS FOR REMOVAL.	16	15	11	14	22	8	10
E 291 E2-19 DO YOU MAKE HARDWIRE CONNECTIONS.	75	78	78	71	76	72	76
E 292 E2-20 DO YOU MAKE PRINTED CIRCUIT BOARD CONNECTIONS	69	72	64	68	73	56	62
E 293 E2-21 DO YOU SOLDER PASSIVE COMPONENTS SUCH AS RESISTORS OK CAPACITORS ON PRINTED CIRCUIT BOARDS	64	65	58	66	70	50	52
E 294 E2-22 DO YOU SOLDER ACTIVE COMPONENTS SUCH AS SOLID-STATE DIODES OR TRANSISTORS ON PRINTED CIRCUIT BOARDS	61	62	58	61	59	50	57
E 295 E3-01 DO YOU WORK WITH RELAYS ON YOUR PRESENT JOB	73	69	78	80	57	58	81
E 296 E3-02 DO YOU ADJUST RELAYS	54	53	56	54	54	33	52
E 297 E3-03 DO YOU CLEAN RELAYS	71	69	72	75	62	58	76
E 298 E3-04 DO YOU INSPECT RELAYS	75	72	75	79	65	61	81
E 299 E3-05 DO YOU REMOVE OR REPLACE COMPLETE RELAYS	73	69	81	80	62	53	86
E 300 E3-06 DO YOU REMOVE OR REPLACE PARTS OR RELAYS	40	39	33	46	46	17	33
E 301 E3-07 DO YOU TROUBLESHOOT RELAYS	69	68	67	73	62	56	67
E 302 E3-08 DO YOU STRAIGHTEN RELAY CONTACTS	66	64	69	70	62	47	76
E 303 E3-09 DO YOU PERFORM TASKS ON RELAY CONTACTS	69	66	72	75	59	50	81
E 304 E3-10 DO YOU PERFORM TASKS ON RELAY CORES	21	18	22	11	38	8	24
E 305 E3-11 DO YOU PERFORM TASKS ON RELAY COILS	27	25	31	13	46	8	33
E 306 E3-12 DO YOU PERFORM TASKS ON RELAY ARMATURES	31	30	31	27	49	14	43
E 307 E3-13 DO YOU PERFORM TASKS ON RELAY SPRINGS	54	52	53	57	51	31	62
E 308 E3-14 DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY OPER (NO) SCHEMATIC SYMBOLS FOR RELAYS	58	55	64	66	49	33	62
E 309 E3-15 DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY CLOSED (NC) SCHEMATIC SYMBOLS FOR RELAYS	57	55	64	64	49	33	62
E 310 E3-16 DO YOU USE OR REFER TO SINGLE POLE, DOUBLE THROW (SPDT) SCHEMATIC SYMBOLS FOR RELAYS	55	53	58	63	46	31	57
E 311 E3-17 DO YOU USE OR REFER TO DOUBLE POLE, DOUBLE THROW (DPDT) SCHEMATIC SYMBOLS FOR RELAYS	55	54	58	63	46	28	57

RELAYS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

SPC SPC SPC SPC SPC SPC SPC SPC SPC SPC
003 007 008 009 010 011 012

E 312 E3-18 DO YOU USE OR REFER TO OTHER RELAY SYMBOLS SCHEMATIC 46 47 47 52 41 25 48
SYMBOLS FOR RELAYS

E 313 E3-19 DO YOU CHECK ELECTRICAL CONTINUITY OF COILS BY 51 48 56 52 49 42 52
MEASURING RESISTANCE

F 314 F1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING 4 5 0 0 8 0 0
WITH MICROPHONES

F 315 F1-02 DO YOU INSPECT MICROPHONES 4 5 0 0 8 0 0
F 316 F1-03 DO YOU CLEAN MICROPHONES 4 5 0 0 8 0 0
F 317 F1-04 DO YOU OPERATE MICROPHONES 4 5 0 0 8 0 0
F 318 F1-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE 4 5 0 0 5 0 0

CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT
F 319 F1-06 DO YOU TROUBLESHOOT DOWN TO MICROPHONE PARTS 2 2 0 0 5 0 0
F 320 F1-07 DO YOU REMOVE OR REPLACE COMPLETE MICROPHONES 3 4 0 0 5 0 0
F 321 F1-08 DO YOU REMOVE OR REPLACE MICROPHONE PARTS 2 2 0 0 5 0 0
F 322 F1-09 DO YOU PERFORM TASKS ON CARBON MICROPHONES 2 2 0 0 5 0 0
F 323 F1-10 DO YOU PERFORM TASKS ON CAPACITOR MICROPHONES 2 2 0 0 5 0 0
F 324 F1-11 DO YOU PERFORM TASKS ON CRYSTAL MICROPHONES 2 2 0 0 5 0 0
F 325 F1-12 DO YOU PERFORM TASKS ON DYNAMIC MICROPHONES 3 3 0 0 5 0 0
F 326 F1-13 DO YOU PERFORM TASKS ON VELOCITY RIBBON MICROPHONES 1 1 0 0 5 0 0

F 327 F2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING 29 32 11 16 51 25 5
WITH SPEAKERS

F 328 F2-02 DO YOU INSPECT SPEAKERS 30 32 14 16 54 25 5
F 329 F2-03 DO YOU CLEAN SPEAKERS 27 29 14 16 46 22 5
F 330 F2-04 DO YOU OPERATE SPEAKERS 28 31 14 14 54 22 5
F 331 F2-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE 29 32 14 16 54 25 5

CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT
F 332 F2-06 DO YOU TROUBLESHOOT DOWN TO SPEAKER PARTS 13 15 0 2 35 11 0
F 333 F2-07 DO YOU REMOVE OR REPLACE COMPLETE SPEAKERS 25 27 14 11 54 17 5
F 334 F2-08 DO YOU REMOVE OR REPLACE SPEAKER PARTS 9 10 0 2 24 3 0
F 335 F2-09 DO YOU PERFORM ANY TASKS ON SPEAKER CONES 7 8 0 0 16 14 0
F 336 F2-10 DO YOU PERFORM ANY TASKS ON SPEAKER SPIDERS 2 2 0 0 8 0 0
F 337 F2-11 DO YOU PERFORM ANY TASKS ON SPEAKER FIELD COILS 3 3 0 0 8 3 0
F 338 F2-12 DO YOU PERFORM ANY TASKS ON SPEAKER VOICE COILS 3 2 0 0 8 0 0
F 339 F2-13 DO YOU PERFORM ANY TASKS ON SPEAKER PERMANENT MAGNETS 4 4 0 0 14 3 0
F 340 F2-14 DO YOU PERFORM ANY TASKS ON SPEAKER ELECTROMAGNETS 3 3 0 0 14 0 0
F 341 F2-15 DO YOU PERFORM ANY TASKS ON SPEAKER SOFT IRON CORES 3 2 0 0 11 0 0

F 342 F3-01 DO YOU USE OSCILLOSCOPES IN YOUR PRESENT JOB 28 29 25 32 14 22 14
F 343 F3-02 DO YOU USE OSCILLOSCOPES TO PERFORM OPERATIONAL 24 25 25 29 11 14 14
CHECKS

F 344 F3-03 DO YOU USE OSCILLOSCOPES TO PERFORM ALIGNMENTS OR 20 20 22 21 14 11 14
ADJUSTMENTS

F 345 F3-04 DO YOU USE OSCILLOSCOPES TO TROUBLESHOOT ELECTRONIC 25 26 25 27 11 19 14
CIRCUITS

F 346 F3-05 DO YOU USE OSCILLOSCOPES TO MEASURE FREQUENCY 19 22 11 27 11 14 10
F 347 F3-06 DO YOU USE OSCILLOSCOPES TO MEASURE TIME 13 14 8 13 14 14 5

OSCILLOSCOPES

SPEAKERS

MICROPHONES

OSCILLOSCOPES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
F 348 F3-07 DO YOU USE OSCILLOSCOPES TO OBSERVE LISAJOUS PATTERNS	10	11	8	11	8	11	5
F 349 F3-08 DO YOU USE OSCILLOSCOPES TO OBSERVE SIGNALS WHILE UTILIZING ATTENUATOR PROBES	15	15	17	13	11	17	5
F 350 F3-09 DO YOU USE OSCILLOSCOPES TO MAKE FREQUENCY OR TIME MEASUREMENTS USING DELAY TIME MULTIPLIERS	9	10	6	9	8	8	5
F 351 F3-10 DO YOU USE OSCILLOSCOPES TO MEASURE AC VOLTAGE	24	26	22	30	11	17	10
F 352 F3-11 DO YOU USE OSCILLOSCOPES TO MEASURE OR OBSERVE SIGNALS AFTER FIRST ADJUSTING THE GAIN AND DC BAL CONTROLS	14	15	14	14	11	14	10
F 353 F3-12 DO YOU USE OSCILLOSCOPES TO MEASURE DC VOLTAGE	23	24	22	29	8	14	14
G 354 G1-01 DO YOU WORK WITH SEMICONDUCTOR DIODES IN YOUR PRESENT JOB	45	43	47	46	32	39	43
G 355 G1-02 DO YOU INSPECT DIODES	43	42	42	43	32	33	38
G 356 G1-03 DO YOU REMOVE OR REPLACE DIODES	44	42	44	46	30	36	43
G 357 G1-04 DO YOU CHECK DIODES USING AN INSTRUMENT	40	39	39	39	30	36	29
G 358 G1-05 DO YOU USE ENERGY LEVEL DIAGRAMS IN YOUR WORK WITH DIODES	4	2	6	4	8	0	0
G 359 G1-06 DO YOU USE PN JUNCTION DIODE CHARACTERISTIC CURVES, TOGETHER WITH VALUES OF FORWARD AND REVERSE BIAS VOLTAGE, TO COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	10	9	6	5	22	6	0
G 360 G1-07 DO YOU COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	14	15	6	18	19	6	5
G 361 G1-08 DO YOU USE OR REFER TO THE GENERAL RULE THAT TEMPERATURE CAN AFFECT THE OPERATION OF DIODES	31	31	25	32	27	22	24
G 362 G1-09 DO YOU IDENTIFY SEMICONDUCTOR DIODES AS OPPOSED TO OTHER ELECTRONIC COMPONENTS, SUCH AS RESISTORS, BASED ON EFFECTS OF DOPING ON CURRENT FLOW	37	38	33	41	30	28	24
G 363 G1-10 DO YOU REFER TO OR DO YOU DETERMINE THE GENERAL EFFECTS OF DOPING ON CURRENT FLOW	8	7	0	9	11	8	0
G 364 G1-11 DO YOU USE OR REFER TO MEASUREMENTS OF FORWARD BIAS RESISTANCE	24	23	17	36	16	8	5
G 365 G1-12 DO YOU USE OR REFER TO DIODE COLOR CODING	24	24	28	25	19	14	19
G 366 G1-13 DO YOU USE OR REFER TO CENTRIFUGAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	4	4	0	2	14	0	0
G 367 G1-14 DO YOU USE OR REFER TO CENTRIPETAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	4	3	0	0	14	0	0
G 368 G1-15 DO YOU USE OR REFER TO DIODE NUMBERING SYSTEM, SUCH AS IN 538	25	22	31	21	22	17	24
G 369 G1-16 DO YOU USE OR REFER TO KINETIC ENERGY OF AN ELECTRON MOVING IN ORBIT	4	4	0	2	14	0	0
G 370 G1-17 DO YOU USE OR REFER TO POTENTIAL ENERGY OF AN ELECTRON MOVING IN ORBIT	4	5	0	4	14	0	0
G 371 G1-18 DO YOU USE OR REFER TO MEASUREMENTS OF REVERSE BIAS RESISTANCE	18	18	11	23	19	8	10
G 372 G1-19 DO YOU USE OR REFER TO NUMBER OF ELECTRONS IN A PARTICULAM SHELL OR ORBIT	5	5	0	4	14	0	0
G 373 G1-20 DO YOU USE OR REFER TO PERMISSIBLE ENERGY LEVELS OF AN ORBITING ELECTRON	4	4	0	2	14	0	0

SEMICONDUCTOR
DIODES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

	SPC 003	SPC 007	SPC U08	SPC 009	SPC 010	SPC 011	SPC 012
G 374 G1-21 DO YOU USE OR REFER TO FORBIDDEN ENERGY LEVELS OF AN ORBITING ELECTRON	4	5	0	4	14	0	0
G 375 G1-22 DO YOU USE OR REFER TO VALENCE ELECTRONS (THOSE IN THE OUTERMOST SHELL)	5	5	0	4	14	0	0
G 376 G1-23 DO YOU USE OR REFER TO ATOMIC NUMBER (TOTAL NUMBER OF ELECTRONS IN ATOM)	6	5	3	4	14	0	5
G 377 G1-24 DO YOU USE OR REFER TO SYMBOLS ON THE DIODE WHICH INDICATE THE CATHODE END	33	31	36	34	24	25	24
G 378 G1-25 DO YOU NEED TO KNOW WHICH MATERIALS ARE USED IN THE CONSTRUCTION OF DIODES SUCH AS GERMANIUM OR SILICON	13	14	6	7	19	8	5
G 379 G1-26 DO YOU NEED TO KNOW THAT SEMICONDUCTORS HAVE NEGATIVE TEMPERATURE COEFFICIENTS OF RESISTANCE (AS TEMPERATURE INCREASES)	16	17	11	16	16	8	10
G 380 G1-27 DO YOU USE OR REFER TO PN JUNCTION DIODE CHARACTERISTIC CURVES, SUCH AS VOLTAGE - CURRENT	8	8	3	11	14	0	5
G 381 G1-28 DO YOU DETERMINE WHETHER PN JUNCTION DIODES ARE FORWARD BIASED OR REVERSE BIASED WHEN YOU READ OR	15	15	14	16	16	8	14
G 382 G1-29 DO YOU USE OR REFER TO VALENCE BAND IN SEMICONDUCTOR MATERIALS	6	5	3	4	16	0	5
G 383 G1-30 DO YOU USE OR REFER TO FORBIDDEN BAND IN SEMICONDUCTOR MATERIALS	6	5	3	2	16	0	5
G 384 G1-31 DO YOU USE OR REFER TO CONDUCTION BAND IN SEMICONDUCTOR MATERIALS	6	5	0	4	16	0	0
G 385 G1-32 DO YOU USE OR REFER TO COVALENT BONDING IN SEMICONDUCTOR MATERIALS	6	5	3	4	16	0	5
G 386 G1-33 DO YOU USE OR REFER TO ELECTRON-HOLE PAIR CREATED IN SEMICONDUCTORS	5	5	0	4	16	0	0
G 387 G1-34 DO YOU USE OR REFER TO ELECTRON FLOW OR HOLE FLOW IN SEMICONDUCTORS	7	6	3	5	16	0	0
G 388 G1-35 DO YOU USE OR REFER TO DONOR IMPURITY IN SEMICONDUCTORS	6	5	0	4	16	0	0
G 389 G1-36 DO YOU USE OR REFER TO ACCEPTOR IMPURITY IN SEMICONDUCTORS	7	6	3	4	19	0	5
G 390 G1-37 DO YOU USE OR REFER TO P-TYPE SEMICONDUCTOR MATERIAL	16	15	19	16	22	3	24
G 391 G1-38 DO YOU USE OR REFER TO N-TYPE SEMICONDUCTOR MATERIAL	15	14	17	16	19	3	19
G 392 G1-39 DO YOU USE OR REFER TO MAJORITY CARRIERS IN SEMICONDUCTORS	6	5	0	4	16	0	0
G 393 G1-40 DO YOU USE OR REFER TO MINORITY CARRIERS IN SEMICONDUCTORS	6	5	0	4	16	0	0
G 394 G1-41 DO YOU USE OR REFER TO JUNCTION RECOMBINATION IN SEMICONDUCTORS	5	5	0	4	16	0	0
G 395 G1-42 DO YOU USE OR REFER TO DEPLETION REGION IN SEMICONDUCTORS	6	5	0	4	16	0	0
G 396 G1-43 DO YOU USE OR REFER TO RELATIONSHIP BETWEEN BARRIER WIDTH AND DIFFERENCE OF POTENTIAL	6	6	0	5	16	0	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DIAGNOSTIC	DESCRIPTION	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
G 397	DI-44 DO YOU USE OR REFER TO THE 10:1 BACK TO FRONT RESISTANCE RATIO FOR DIODES	12	13	3	18	14	8	0
G 398	DI-45 DO YOU USE OR REFER TO BARRIER HEIGHT IN SEMICONDUCTORS	4	4	0	4	14	0	0
G 399	DI-46 DO YOU USE OR REFER TO DIODE SUBSTITUTION INFORMATION	18	18	14	16	19	14	10
G 400	DI-47 DO YOU USE OR REFER TO MAXIMUM AVERAGE FORWARD CURRENT DIODE RATINGS	11	13	3	13	16	8	0
G 401	DI-48 DO YOU USE OR REFER TO PEAK RECURRENT FORWARD CURRENT DIODE RATINGS	9	11	3	9	16	6	0
G 402	DI-49 DO YOU USE OR REFER TO MAXIMUM SURGE CURRENT DIODE RATINGS	10	12	3	13	16	6	0
G 403	DI-50 DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE DIODE RATINGS	10	11	6	9	16	8	0
G 404	G2-01 DO YOU WORK WITH TRANSISTORS IN YOUR PRESENT JOB?	50	49	42	52	46	36	29
G 405	G2-02 DO YOU INSPECT TRANSISTORS	48	48	39	50	46	33	29
G 406	G2-03 DO YOU REMOVE OR REPLACE TRANSISTORS	47	48	36	50	43	36	29
G 407	G2-04 DO YOU CHECK TRANSISTORS USING AN INSTRUMENT	45	47	33	48	43	36	24
G 408	G2-05 DO YOU USE OR REFER TO EMITTER - BASE (EB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	39	39	33	39	35	31	29
G 409	G2-06 DO YOU USE OR REFER TO COLLECTOR - BASE (CB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	34	33	31	32	35	22	24
G 410	G2-07 DO YOU USE OR REFER TO EMITTER - COLLECTOR (EC) RESISTANCE MEASUREMENTS	34	33	31	34	35	19	24
G 411	G2-08 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE EMITTER - BASE JUNCTION	14	15	6	13	24	8	10
G 412	G2-09 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE COLLECTOR - BASE JUNCTION	14	15	3	11	27	8	5
G 413	G2-10 DO YOU USE OR REFER TO THE PHYSICAL SIZE OF THE TRANSISTOR STRUCTURE (COLLECTOR, BASE AND EMITTER)	28	29	17	25	30	25	10
G 414	G2-11 DO YOU USE OR REFER TO LEAKAGE CURRENT (ICBO) IN A TRANSISTOR	17	16	11	14	24	8	10
G 415	G2-12 DO YOU USE OR REFER TO TRANSISTOR SCHEMATIC SYMBOLS	44	44	39	43	38	33	29
G 416	G2-13 DO YOU USE OR REFER TO TRANSISTOR NOTATION SUCH AS J1, Q2, Q3, ETC	45	44	42	45	38	33	33
G 417	G2-14 DO YOU USE OR REFER TO TRANSISTOR SUBSTITUTION INFORMATION	28	28	22	20	27	17	14
G 418	G2-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE TRANSISTOR BASE CURRENT IS NORMALLY SIGNIFICANTLY	17	19	3	16	22	14	5
G 419	G2-16 DO YOU USE THE INFORMATION THAT THE EFFECT OF EMITTER BASE VOLTAGE ON BASE CURRENT IS THE CONTROLLING FACTOR FOR	18	18	14	13	24	11	19
G 420	G2-17 DO YOU USE THE GENERAL RULE THAT LEAKAGE CURRENT (ICBO) IN A TRANSISTOR INCREASES AS TEMPERATURE INCREASES	15	16	6	13	22	8	5
G 421	G2-18 DO YOU USE OR REFER TO TRANSISTOR CHARACTERISTIC CURVES	4	8	6	5	22	3	5

TRANSISTORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC 003	SPC 007	SPC U08	SPC 009	SPC 010	SPC 011	SPC 012
G 422 G2-19 DO YOU USE OR REFER TO BETA TRANSISTOR GAINS	6	5	3	4	19	0	5
G 423 G2-20 DO YOU USE OR REFER TO ALPHA TRANSISTOR GAINS	6	5	3	4	19	0	5
G 424 G2-21 DO YOU USE OR REFER TO GAMMA TRANSISTOR GAINS	6	5	3	4	19	0	5
G 425 G2-22 DO YOU CALCULATE BETA TRANSISTOR GAINS	4	2	3	0	16	0	5
G 426 G2-23 DO YOU CALCULATE ALPHA TRANSISTOR GAINS	4	2	3	0	16	0	5
G 427 G2-24 DO YOU CALCULATE GAMMA TRANSISTOR GAINS	4	2	3	0	16	0	5
G 428 G3-01 DO YOU WORK WITH TRANSISTOR AMPLIFIERS IN YOUR PRESENT JOB	18	18	14	14	22	11	5
G 429 G3-02 DO YOU INSPECT TRANSISTOR AMPLIFIERS	18	20	6	18	22	11	0
G 430 G3-03 DO YOU ALIGN OR ADJUST TRANSISTOR AMPLIFIERS	10	11	3	13	14	3	0
G 431 G3-04 DO YOU TROUBLESHOOT TO THE AMPLIFIER CIRCUIT LEVEL	15	17	6	20	22	6	0
G 432 G3-05 DO YOU TROUBLESHOOT TO AMPLIFIER COMPONENTS	16	18	6	18	22	6	0
G 433 G3-06 DO YOU REMOVE OR REPLACE THE COMPLETE AMPLIFIER	17	18	8	16	22	8	5
G 434 G3-07 DO YOU REMOVE OR REPLACE AMPLIFIER COMPONENTS	16	17	8	18	22	3	5
G 435 G3-08 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A CHANGE IN BASE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	4	4	0	2	16	0	0
G 436 G3-09 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	6	5	3	4	16	0	0
G 437 G3-10 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	4	4	0	4	14	0	0
G 438 G3-11 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	6	5	3	4	14	0	0
G 439 G3-12 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	4	4	0	4	14	0	0
G 440 G3-13 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN CIRCUIT ANALYSIS (THIS METHOD REQUIRES YOU TO PLOT A QUIESCENT POINT) FOR A TRANSISTOR	4	4	0	2	16	0	0
G 441 G3-14 DO YOU USE THE LOAD-LINE METHOD OF ANALYSIS IN YOUR CIRCUIT ANALYSIS (THIS METHOD REQUIRES YOU TO PLOT A QUIESCENT POINT) FOR A TRANSISTOR	4	4	0	4	16	3	0
G 442 G3-15 DO YOU USE OR REFER TO THE OPERATING POINT (QUIESCENT POINT) FOR A TRANSISTOR	7	7	0	4	16	3	0
G 443 G3-16 DO YOU CALCULATE THE SPECIFIC QUIESCENT POINT FOR A PARTICULAR TRANSISTOR	4	3	0	0	16	0	0
G 444 G3-17 DO YOU MEASURE VOLTAGE GAIN USED IN THE COMMON EMITTER CONFIGURATION	10	11	3	13	16	3	0
G 445 G3-18 DO YOU MEASURE CURRENT GAIN USED IN THE COMMON EMITTER CONFIGURATION	8	8	3	7	16	3	0
G 446 G3-19 DO YOU MEASURE POWER GAIN USED IN THE COMMON EMITTER CONFIGURATION	9	10	3	9	16	3	0
G 447 G3-20 DO YOU CALCULATE THE VOLTAGE GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE CHANGE	4	4	0	0	16	3	0

TRANSISTOR
AMPLIFIERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
6 448 G3-21 DO YOU CALCULATE THE CURRENT GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE	4	3	0	0	16	0	0
6 449 G3-22 DO YOU CALCULATE THE POWER GAIN FOR A SPECIFIC TRANSISTOR USING A FORMULA THAT IS, DO YOU MULTIPLY THE	3	2	0	0	14	0	0
6 450 G3-23 DO YOU NEED TO KNOW THAT MORE COLLECTOR CURRENT IS GENERATED WITH LESS COLLECTOR VOLTAGE AS TEMPERATURE	4	5	0	0	14	3	0
6 451 G3-24 DO YOU COMPUTE THE STATIC OPERATING POINT EQ3 OF A TRANSISTOR AT DIFFERENT TEMPERATURES	3	2	0	0	14	0	0
6 452 G3-25 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	6	5	0	2	16	3	0
6 453 G3-26 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH SELF-	5	5	0	0	16	3	0
6 454 G3-27 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	7	6	6	2	16	3	0
6 455 G3-28 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	6	5	3	2	16	3	0
6 456 G3-29 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	6	5	3	2	16	3	0
6 457 G3-30 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	7	6	3	4	16	3	0
6 458 G3-31 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM EMITTER (SWAMPING) RESISTOR STABILIZATION	6	6	0	4	16	0	0
6 459 G3-32 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM SELF-BIAS STABILIZATION	6	5	0	2	16	0	0
6 460 G3-33 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THERMISTOR STABILIZATION	8	8	3	5	16	0	0
6 461 G3-34 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM FORWARD BIAS DIODE STABILIZATION	7	7	0	5	16	0	0
6 462 G3-35 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM REVERSE BIAS DIODE STABILIZATION	7	7	0	5	16	0	0
6 463 G3-36 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM DOUBLE DIODE STABILIZATION	6	6	0	4	16	0	0
6 464 G3-37 DO YOU IDENTIFY AMPLITUDE DISTORTION FOR TRANSISTOR CIRCUITS	5	5	0	4	11	3	0
6 465 G3-38 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF AMPLITUDE DISTORTION	7	8	0	5	14	3	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

SPC SPC SPC SPC SPC SPC SPC SPC
U03 007 008 009 010 011 012

Task Description	U03	007	008	009	010	011	012
G 466 G3-39 DO YOU IDENTIFY FREQUENCY DISTORTION FOR TRANSISTOR CIRCUITS	6	6	0	5	11	0	0
G 467 G3-40 DO YOU IDENTIFY PHASE DISTORTION FOR TRANSISTOR CIRCUITS	4	5	0	5	11	0	0
G 468 G3-41 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF PHASE DISTORTION	4	5	0	4	14	0	0
G 469 G3-42 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF FREQUENCY DISTORTION	5	5	0	4	11	0	0
G 470 G3-43 DO YOU NEED TO KNOW THE DEGENERATIVE EFFECTS ON THE CIRCUIT CAUSED BY CHANGING EMITTER RESISTANCE FOR	4	5	0	5	11	0	0
G 471 G3-44 DO YOU DETERMINE THE CLASS OF OPERATION FOR AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	7	8	0	9	14	3	0
G 472 G3-45 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	2	2	0	2	8	0	0
G 473 G3-46 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	12	13	6	13	16	6	0
G 474 G3-47 DO YOU TROUBLESHOOT OR REPAIR COMPLEMENTARY SYMMETRY CIRCUITS	2	2	0	0	8	0	0
G 475 G3-48 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	4	5	0	5	8	3	0
G 476 G3-49 DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	3	3	0	4	8	0	0
H 477 H1-01 DO YOU USE OR REFER TO VARACTORS	7	7	3	4	14	6	5
H 478 H1-02 DO YOU USE OR REFER TO TUNNEL DIODES	7	8	0	7	14	6	0
H 479 H1-03 DO YOU USE OR REFER TO FIELD EFFECT TRANSISTORS (FET)	19	20	17	21	16	14	24
H 480 H1-04 DO YOU USE OR REFER TO UNIJUNCTION TRANSISTORS	14	15	11	16	14	11	14
H 481 H1-05 DO YOU USE OR REFER TO ZENER DIODES	46	49	42	48	38	39	43
H 482 H1-06 DO YOU USE OR REFER TO INTEGRATED CIRCUITS	45	49	39	43	46	36	43
H 483 H2-01 IN YOUR PRESENT JOB DO YOU WORK WITH POWER SUPPLIES	50	48	50	52	49	28	48
H 484 H2-02 DO YOU INSPECT POWER SUPPLIES	46	44	50	50	35	28	48
H 485 H2-03 DO YOU CLEAN POWER SUPPLIES	43	42	42	52	30	25	38
H 486 H2-04 DO YOU ALIGN OR ADJUST POWER SUPPLIES	32	29	39	38	24	8	33
H 487 H2-05 DO YOU TROUBLESHOOT TO POWER SUPPLY CIRCUIT LEVEL	38	37	36	43	32	19	29
H 488 H2-06 DO YOU TROUBLESHOOT TO POWER SUPPLY COMPONENTS	35	35	31	38	30	22	24
H 489 H2-07 DO YOU REMOVE OR REPLACE COMPLETE POWER SUPPLIES	36	35	39	39	30	17	38
H 490 H2-08 DO YOU REMOVE OR REPLACE POWER SUPPLY COMPONENTS	34	33	31	38	30	17	29
H 491 H2-09 DO YOU WORK WITH HALF-WAVE RECTIFIERS	25	23	31	25	19	11	24
H 492 H2-10 DO YOU WORK WITH FULL-WAVE RECTIFIERS OTHER THAN BRIDGE RECTIFIERS	25	24	28	25	19	11	19
H 493 H2-11 DO YOU WORK WITH BRIDGE RECTIFIERS	32	31	36	30	22	19	29
H 494 H2-12 DO YOU WORK WITH THREE-PHASE RECTIFIERS	13	12	8	13	19	3	5
H 495 H2-13 DO YOU USE OR REFER TO INPUT VOLTAGE	37	38	33	39	38	19	24
H 496 H2-14 DO YOU USE OR REFER TO INPUT FREQUENCY	19	18	19	23	19	11	14
H 497 H2-15 DO YOU USE OR REFER TO PEAK OUTPUT VOLTAGE	23	23	22	21	24	14	14
H 498 H2-16 DO YOU USE OR REFER TO AVERAGE OUTPUT VOLTAGE	22	22	22	23	24	11	14
H 499 H2-17 DO YOU USE OR REFER TO RIPPLE AMPLITUDE	7	7	6	4	14	6	10
H 500 H2-18 DO YOU USE OR REFER TO RIPPLE FREQUENCY	6	5	3	4	16	3	5

SOLID-STATE
SPECIAL PURPOSE
DEVICES

POWER SUPPLIES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

SPC SPC SPC SPC SPC SPC SPC SPC SPC SPC
003 007 008 009 010 011 012

DY-TSK

Item	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
M 501 H2-19 DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE	12	12	8	7	22	14	10
M 502 H2-20 DO YOU USE OR REFER TO SHAPE OF OUTPUT WAVEFORMS	14	12	22	13	16	6	14
M 503 H2-21 DC YOU USE OR REFER TO EFFECTIVE OUTPUT VOLTAGE	22	20	25	21	22	11	14
M 504 H2-22 DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE FILTERS	19	15	31	18	19	8	24
M 505 H2-23 DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE FILTERS	13	11	19	13	19	6	14
M 506 H2-24 DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE INPUT L-TYPE FILTERS	11	10	11	13	16	3	5
M 507 H2-25 DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE INPUT L-TYPE FILTERS	10	8	11	11	16	3	5
M 508 H2-26 DO YOU WORK WITH CIRCUITS WHICH EMPLOY LC PI-TYPE FILTERS	6	5	3	5	16	3	0
M 509 H2-27 DO YOU WORK WITH CIRCUITS WHICH EMPLOY RC PI-TYPE FILTERS	7	5	6	5	16	3	5
M 510 H2-28 DO YOU WORK WITH CIRCUITS WHICH EMPLOY DON'T REMEMBER WHICH TYPE OF FILTER	21	22	11	29	19	11	14
M 511 H2-29 DO YOU HAVE THE OPTION OF REPLACING ONE TYPE OF FILTER WITH A DIFFERENT TYPE FILTER	5	4	3	4	14	0	0
M 512 H3-01 DO YOU WORK WITH OSCILLATORS IN YOUR PRESENT JOB	8	6	11	7	8	3	9
M 513 H3-02 DO YOU INSPECT OSCILLATORS	7	5	8	5	8	6	5
M 514 H3-03 DO YOU ALIGN OR ADJUST OSCILLATORS	4	4	6	4	8	0	5
M 515 H3-04 DO YOU REMOVE OR REPLACE COMPLETE OSCILLATORS	5	5	6	5	8	3	0
M 516 H3-05 DO YOU REMOVE OR REPLACE OSCILLATOR COMPONENTS	4	4	6	4	8	3	0
M 517 H3-06 DO YOU TROUBLESHOOT TO OSCILLATOR CIRCUIT LEVEL	4	4	6	4	8	3	0
M 518 H3-07 DO YOU TROUBLESHOOT TO OSCILLATOR COMPONENTS	4	4	6	4	8	3	0
M 519 H3-08 DO YOU USE OR REFER TO FEEDBACK	4	4	6	4	8	0	5
M 520 H3-09 DO YOU USE OR REFER TO FREQUENCY DETERMINING DEVICES (FDD)	2	2	0	2	8	0	0
M 521 H3-10 DO YOU USE OR REFER TO AMPLITUDE STABILITY	3	3	3	2	8	0	5
M 522 H3-11 DO YOU USE OR REFER TO FREQUENCY STABILITY	2	2	0	0	8	0	0
M 523 H3-12 DO YOU USE OR REFER TO DAMPING	3	3	0	4	8	0	0
M 524 H3-13 DO YOU USE OR REFER TO REGENERATIVE FEEDBACK	3	3	0	4	8	0	0
M 525 H3-14 DO YOU USE OR REFER TO PIEZOELECTRIC EFFECT	2	2	0	0	8	0	0
M 526 H3-15 DO YOU USE OR REFER TO CRITICAL DAMPING	2	2	0	0	8	0	0
M 527 H3-16 DO YOU USE OR REFER TO UNDER DAMPING	2	2	0	2	8	0	0
M 528 H3-17 DO YOU USE OR REFER TO OVER DAMPING	2	2	0	2	8	0	0
M 529 H3-18 DO YOU WORK WITH OSCILLATORS WHICH USE LC TANK CIRCUITS AS FDD	3	2	6	2	8	0	5
M 530 H3-19 DO YOU WORK WITH OSCILLATORS WHICH USE RC NETWORKS AS FDD	4	2	6	2	8	0	5
M 531 H3-20 DO YOU WORK WITH OSCILLATORS WHICH USE CRYSTALS AS FDD	3	2	3	0	8	0	0
M 532 H3-21 DO YOU WORK WITH OSCILLATORS WHICH USE DON'T REMEMBER WHICH TYPE OF FDD	4	5	3	4	8	3	0
M 533 H3-22 DO YOU WORK WITH SERIES HARTLEY SINUSOIDAL OSCILLATORS	2	2	0	0	8	0	0

OSCILLATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DIY-TSK	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
M 534 M3-23 00 YOU WORK WITH SHUNT HARTLEY SINUSOIDAL OSCILLATORS	2	2	0	0	8	0	0
M 535 M3-24 00 YOU WORK WITH COLPITTS SINUSOIDAL OSCILLATORS	2	2	0	0	8	0	0
M 536 M3-25 00 YOU WORK WITH CLAPP SINUSOIDAL OSCILLATORS	2	2	0	0	8	0	0
M 537 M3-26 00 YOU WORK WITH BUTLER SINUSOIDAL OSCILLATORS	2	2	0	0	8	0	0
M 538 M3-27 00 YOU WORK WITH DON'T REMEMBER WHICH TYPE OF OSCILLATORS	4	4	3	4	5	3	0
I 539 11-01 00 YOU WORK WITH MULTIVIBRATORS IN YOUR PRESENT JOB	11	12	8	18	8	6	5
I 540 11-02 00 YOU INSPECT WAVE GENERATING OR SHAPING CIRCUITS	6	5	6	9	8	0	5
I 541 11-03 00 YOU ALIGN OR ADJUST WAVE GENERATING OR SHAPING CIRCUITS	5	5	6	7	8	0	5
I 542 11-04 00 YOU CALIBRATE WAVE GENERATING OR SHAPING CIRCUITS	4	4	3	5	8	0	0
I 543 11-05 00 YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUITS	6	5	6	9	8	0	0
I 544 11-06 00 YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	5	4	8	5	8	0	5
I 545 11-07 00 YOU REMOVE OR REPLACE COMPLETE WAVE GENERATING OR SHAPING CIRCUITS	3	3	3	4	8	0	0
I 546 11-08 00 YOU REMOVE OR REPLACE WAVE GENERATING OR SHAPING COMPONENTS	3	2	3	0	8	0	0
I 547 11-09 00 YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN LC TANK CIRCUITS	2	2	3	0	8	0	5
I 548 11-10 00 YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN RC NETWORKS	2	2	3	0	8	0	5
I 549 11-11 00 YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN CRYSTALS	2	2	0	0	8	0	0
I 550 11-12 00 YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN DON'T REMEMBER WHICH TYPE OF FDU	6	7	3	7	8	6	0
I 551 11-13 00 YOU WORK WITH ADJUSTABLE MULTIVIBRATORS	7	8	6	11	8	3	5
I 552 11-14 00 YOU WORK WITH MONOSTABLE MULTIVIBRATORS	8	9	6	14	8	3	5
I 553 11-15 00 YOU WORK WITH BISTABLE MULTIVIBRATORS	8	9	6	14	8	3	5
I 554 11-16 00 YOU WORK WITH DON'T REMEMBER WHICH TYPE MULTIVIBRATORS	4	5	0	4	8	6	0
I 555 12-01 00 YOU WORK WITH LIMITERS OR CLAMPERS IN YOUR PRESENT JOB	6	5	8	7	8	0	5
I 556 12-02 00 YOU WORK WITH SERIES DIODE LIMITERS	5	5	6	5	8	0	5
I 557 12-03 00 YOU WORK WITH SHUNT DIODE LIMITERS	3	4	0	4	8	0	0
I 558 12-04 00 YOU WORK WITH LIMITERS WITH BIAS	2	2	0	0	8	0	0
I 559 12-05 00 YOU WORK WITH ZENER DIODE LIMITERS	4	4	3	4	8	0	0
I 560 12-06 00 YOU WORK WITH TRANSISTOR LIMITERS	4	5	3	5	8	0	0
I 561 12-07 00 YOU WORK WITH DON'T KNOW WHICH TYPE OF LIMITERS	4	4	3	5	8	0	0
I 562 12-08 00 YOU WORK WITH BASIC DIODE CLAMPING CIRCUITS	2	2	0	2	8	0	0
I 563 12-09 00 YOU WORK WITH DIODE CLAMPING CIRCUITS WITH BIAS	2	2	3	0	8	0	5
I 564 12-10 00 YOU WORK WITH DON'T KNOW WHICH TYPE OF CLAMPING CIRCUIT	5	5	3	7	8	0	0
I 565 13-01 00 YOU WORK IN YOUR PRESENT JOB DO YOU WORK ON EQUIPMENT WHICH CONTAINS ELECTRON TUBES	51	55	42	46	57	44	33
I 566 13-02 00 YOU CHECK ELECTRON TUBES TO SEE IF THEY ARE GOOD	49	54	36	43	57	47	29

ELECTRON TUBES

LIMITERS AND CLAMPERS

MULTIVIBRATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-75K

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
I 567 13-03 DO YOU USE TUBE TESTERS TO CHECK ELECTRON TUBES	41	46	31	39	43	36	24
I 568 13-04 DO YOU USE MULTIMETERS TO CHECK ELECTRON TUBES	31	34	22	34	24	31	19
I 569 13-05 DO YOU USE SCOPES TO CHECK ELECTRON TUBES	8	8	6	9	11	6	0
I 570 13-06 DO YOU USE SUBSTITUTION TO CHECK ELECTRON TUBES	35	33	36	29	35	33	33
I 571 13-07 DO YOU USE OR REFER TO CUTOFF	12	13	3	16	14	6	5
I 572 13-08 DO YOU USE OR REFER TO INVERSE VOLTAGE RATING	17	8	0	13	11	3	0
I 573 13-09 DO YOU USE OR REFER TO PEAK CURRENT RATING	12	13	3	16	14	6	5
I 574 13-10 DO YOU USE OR REFER TO TRANSIT TIME	6	6	0	7	11	3	0
I 575 13-11 DO YOU USE OR REFER TO PLATE DISSIPATION RATING	8	9	3	5	11	6	5
I 576 13-12 DO YOU USE OR REFER TO SATURATION	14	17	3	21	11	8	5
I 577 13-13 DO YOU USE OR REFER TO DC PLATE RESISTANCE	10	12	3	11	11	6	5
I 578 13-14 DO YOU COMPUTE ACTUAL VALUES OF THE DC PLATE RESISTANCE FOR ELECTRON TUBES	3	3	0	5	8	0	0
I 579 13-15 DO YOU USE OR REFER TO PLATE VOLTAGE	24	25	14	27	19	17	14
I 580 13-16 DO YOU USE OR REFER TO PLATE CURRENT	19	20	8	20	16	11	10
I 581 13-17 DO YOU USE OR REFER TO GRID VOLTAGE	24	24	17	25	19	14	19
I 582 13-18 DO YOU USE OR REFER TO GRID CURRENT	19	19	11	20	16	8	14
I 583 13-19 DO YOU USE OR REFER TO CATHODE VOLTAGE	24	24	17	25	19	11	19
I 584 13-20 DO YOU USE OR REFER TO CATHODE CURRENT	19	20	11	23	16	8	14
I 585 13-21 DO YOU USE OR REFER TO THE TRIODE AMPLIFICATION FACTOR (THE AMPLIFICATION FACTOR FOR TRIODES IS DEFINED AS	5	5	0	4	11	0	0
I 586 13-22 DO YOU CALCULATE ACTUAL VALUES OF TRIODE AMPLIFICATION FACTORS	3	3	0	0	11	0	0
I 587 13-23 DO YOU USE OR REFER TO MULTIGRID (TETRODE, PENTODE, ETC) AMPLIFICATION FACTORS	7	7	3	4	11	6	0
I 588 13-24 DO YOU USE OR REFER TO ELECTRON TUBE TRANSCONDUCTANCE (G, WHICH IS MEASURED IN MHOS)	3	2	0	0	11	0	0
I 589 13-25 DO YOU CALCULATE ACTUAL VALUES OF ELECTRON TUBE TRANSCONDUCTANCES	3	2	0	0	11	0	0
I 590 13-26 DO YOU USE OR REFER TO THE ELECTRON TUBE PARAMETER CALLED AC PLATE RESISTANCE	3	2	3	0	11	0	0
I 591 13-27 DO YOU CALCULATE ACTUAL VALUES OF AC PLATE RESISTANCE	3	3	0	2	11	0	0
I 592 13-28 DO YOU USE OR REFER TO ELECTRON TUBE INTERELECTRODE CAPACITANCE	3	3	0	0	11	0	0
I 593 13-29 DO YOU USE OR REFER TO CHARACTERISTIC CURVES IN YOUR WORK WITH ELECTRON TUBES	4	4	0	2	11	0	0
I 594 13-30 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE VOLTAGE FOR A SPECIFIED BIAS	3	2	3	4	8	0	5
I 595 13-31 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE CURRENT FOR A SPECIFIED BIAS	3	2	3	4	8	0	5
I 596 13-32 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR CUTOFF	4	4	6	4	11	0	10
I 597 13-33 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR SATURATION	5	4	3	4	11	0	5

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
J 624 J2-09 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROSTATIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES	11	13	3	16	5	6	0
J 625 J2-10 DO YOU USE OR REFER TO PHOSPHOR COATINGS	18	18	19	27	5	6	19
J 626 J2-11 DO YOU USE OR REFER TO AQUADAG SCREENS	5	5	3	5	3	3	5
J 627 J2-12 DO YOU USE OR REFER TO ELECTRON OPTICS	7	5	8	4	5	6	14
J 628 J2-13 DO YOU USE OR REFER TO PERSISTENCE	4	3	3	0	8	3	5
J 629 J2-14 DO YOU USE OR REFER TO DECAY TIMES	6	5	6	4	4	3	10
J 630 J2-15 DO YOU USE OR REFER TO FLUORESCENCE	10	8	11	7	8	3	14
J 631 J2-16 DO YOU USE OR REFER TO PHOSPHORESCENCE	10	9	11	11	8	6	14
J 632 J3-01 DO YOU WORK ON TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	2	1	0	2	5	0	0
J 633 J3-02 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	1	0	0	0	3	0	0
J 634 J3-03 DO YOU PERFORM TASKS ON FREQUENCY MIXERS	1	0	0	0	3	0	0
J 635 J3-04 DO YOU USE OR REFER TO THE HETERODYNING OF SIGNALS	1	0	0	0	3	0	0
J 636 J3-05 DO YOU WORK WITH TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
J 637 J3-06 DO YOU PERFORM TASKS ON REACTANCE MODULATORS	1	0	0	0	3	0	0
J 638 J3-07 DO YOU PERFORM TASKS ON MODULATED OSCILLATORS	1	0	0	0	3	0	0
K 639 KI-01 DO YOU WORK ON AM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	1	0	0	0	3	0	0
K 639 KI-02 DO YOU INSPECT AM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 640 KI-03 DO YOU CLEAN AM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 641 KI-04 DO YOU ALIGN OR ADJUST AM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 642 KI-05 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 643 KI-06 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE COMPONENTS	1	0	0	0	3	0	0
K 644 KI-07 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 645 KI-08 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE COMPONENTS	1	0	0	0	3	0	0
K 646 KI-09 DO YOU PERFORM TASKS ON RF OSCILLATORS	1	0	0	0	3	0	0
K 647 KI-10 DO YOU PERFORM TASKS ON RF AMPLIFIERS	1	0	0	0	3	0	0
K 648 KI-11 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	1	0	0	0	3	0	0
K 649 KI-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	1	0	0	0	3	0	0
K 650 KI-13 DO YOU PERFORM TASKS ON LOCAL OSCILLATORS	1	0	0	0	3	0	0
K 651 KI-14 DO YOU PERFORM TASKS ON IF AMPLIFIERS	1	0	0	0	3	0	0
K 652 KI-15 DO YOU PERFORM TASKS ON DETECTORS	1	0	0	0	3	0	0
K 653 KI-16 DO YOU PERFORM TASKS ON DON'T REMEMBER WHICH AM STAGE TRANSMITTERS	1	0	0	0	3	0	0
K 654 KI-17 DO YOU USE OR REFER TO AMPLITUDE STABILIZATION IN TRANSMITTERS	1	0	0	0	3	0	0
K 655 KI-18 DO YOU USE OR REFER TO FREQUENCY STABILIZATION IN TRANSMITTERS	1	0	0	0	3	0	0
K 656 KI-19 DO YOU USE OR REFER TO SENSITIVITY OF RECEIVERS	1	0	0	0	3	0	0
K 657 KI-20 DO YOU USE OR REFER TO SELECTIVITY OF RECEIVERS	1	0	0	0	3	0	0
K 658 KI-21 DO YOU USE OR REFER TO 2ND HARMONIC DISTORTION	1	0	0	0	3	0	0
K 659 KI-22 DO YOU USE OR REFER TO BANDPASS DISTORTION	1	0	0	0	3	0	0
K 660 KI-23 DO YOU USE OR REFER TO SQUARE LAW DISTORTION	1	0	0	0	3	0	0

HETERODYNING,
MODULATION, AND
DEMODULATION

AM SYSTEMS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

Task ID	Description	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
K 661	K1-24 DO YOU USE OR REFER TO CO-CHANNEL INTERFERENCE	1	0	0	0	3	0	0
K 662	K1-25 DO YOU USE OR REFER TO IMAGE FREQUENCIES IN RECEIVERS	1	0	0	0	3	0	0
K 663	K1-26 DO YOU USE OR REFER TO SIGNAL TO IMAGE RATIOS OR IMAGE REJECTION RATIOS	1	0	0	0	3	0	0
K 664	K1-27 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM TRANSMITTER SCHEMATIC DIAGRAMS	1	0	0	0	3	0	0
K 665	K1-28 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM RECEIVER SCHEMATIC DIAGRAMS	1	0	0	0	3	0	0
K 666	K2-01 DO YOU WORK WITH FM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	1	1	0	2	3	0	0
K 667	K2-02 DO YOU INSPECT FM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 668	K2-03 DO YOU CLEAN FM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 669	K2-04 DO YOU ALIGN FM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 670	K2-05 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 671	K2-06 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE COMPONENTS	1	0	0	0	3	0	0
K 672	K2-07 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
K 673	K2-08 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE COMPONENTS	1	0	0	0	3	0	0
K 674	K2-09 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	1	0	0	0	3	0	0
K 675	K2-10 DO YOU PERFORM TASKS ON FREQUENCY MULTIPLIERS	1	0	0	0	3	0	0
K 676	K2-11 DO YOU PERFORM TASKS ON DRIVERS (INTERMEDIATE AMPLIFIERS)	1	1	0	2	3	0	0
K 677	K2-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	1	0	0	0	3	0	0
K 678	K2-13 DO YOU PERFORM TASKS ON RF AMPLIFIERS	1	0	0	0	3	0	0
K 679	K2-14 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	1	0	0	0	3	0	0
K 680	K2-15 DO YOU PERFORM TASKS ON IF AMPLIFIERS	1	0	0	0	3	0	0
K 681	K2-16 DO YOU PERFORM TASKS ON LIMITERS	1	0	0	0	3	0	0
K 682	K2-17 DO YOU PERFORM TASKS ON FREQUENCY DISCRIMINATORS	1	0	0	0	3	0	0
K 683	K2-18 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM TRANSMITTERS	1	0	0	0	3	0	0
K 684	K2-19 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM RECEIVERS	1	0	0	0	3	0	0
K 685	K3-01 DO YOU CONVERT DECIMAL (BASE 10) NUMBERS TO OCTAL (BASE 8) NUMBERS	3	2	3	2	8	0	5
K 686	K3-02 DO YOU CONVERT DECIMAL NUMBERS TO BINARY (BASE 2) NUMBERS	5	5	6	5	11	0	10
K 687	K3-03 DO YOU CONVERT OCTAL NUMBERS TO DECIMAL NUMBERS	4	3	3	5	8	0	5
K 688	K3-04 DO YOU CONVERT OCTAL NUMBERS TO BINARY NUMBERS	3	3	0	4	8	0	0
K 689	K3-05 DO YOU CONVERT BINARY NUMBERS TO DECIMAL NUMBERS	4	4	3	4	11	0	5
K 690	K3-06 DO YOU CONVERT BINARY NUMBERS TO OCTAL NUMBERS	3	3	0	4	8	0	0
K 691	K3-07 DO YOU ADD BINARY NUMBERS TO GET A SUM	6	5	3	5	14	0	5
K 692	K3-08 DO YOU SUBTRACT BINARY NUMBERS USING THE END-AROUND-CARRY METHOD	3	4	0	2	11	0	0
K 693	K3-09 DO YOU SUBTRACT BINARY NUMBERS USING THE DIRECT SUBTRACTION METHOD	4	5	0	4	11	0	0

NUMBERING SYSTEMS

FM SYSTEMS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

BY-TSK

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
K 694 K3-12 DO YOU ADD OCTAL NUMBERS TO GET A SUM	5	4	6	5	8	0	5
L 695 L1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO LOGIC FUNCTIONS	4	3	8	2	8	0	10
L 696 L1-02 DO YOU CONSTRUCT TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	2	2	0	2	8	0	0
L 697 L1-03 DO YOU CONSTRUCT TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	3	3	0	4	8	0	0
L 698 L1-04 DO YOU CONSTRUCT TRUTH TABLES FOR AND OR LOGIC SYMBOLS WITH STATE INDICATORS	2	2	0	2	8	0	0
L 699 L1-05 DO YOU CONSTRUCT TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS OR GATES	2	2	0	2	8	0	0
L 700 L1-06 DO YOU USE OR REFER TO TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	3	3	3	2	8	0	0
L 701 K1-07 DO YOU USE OR REFER TO TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	3	3	3	2	8	0	0
L 702 K1-08 DO YOU USE OR REFER TO TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	3	3	3	2	8	0	0
L 703 L1-09 DO YOU USE OR REFER TO TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS	3	3	3	2	8	0	0
L 704 L1-10 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR AND GATES	4	3	6	2	8	0	5
L 705 L1-11 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR OR GATES	4	3	6	2	8	0	5
L 706 L1-12 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR NAND OR NOR GATES	4	3	6	2	8	0	5
L 707 L1-13 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR EXCLUSIVE OR GATES	4	3	6	2	8	0	5
L 708 L2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO BOOLEAN EQUATIONS, LOGIC DIAGRAMS, OR LOGIC TRANSISTOR LOGIC (DCTL) CIRCUITS	2	2	3	2	0	0	5
L 709 L2-02 DO YOU DRAW LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUITS	1	0	0	0	3	0	0
L 710 L2-03 DO YOU CONSTRUCT TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	1	0	0	0	3	0	0
L 711 L2-04 DO YOU DRAW LOGIC DIAGRAMS FROM GIVEN BOOLEAN EQUATIONS	1	0	0	0	3	0	0
L 712 L2-05 DO YOU MEASURE INPUTS OR OUTPUTS OF LOGIC GATES	2	1	3	0	3	0	5
L 713 L2-06 DO YOU DEVELOP OR ANALYZE BOOLEAN EQUATIONS IN THE PROCESS OF THROUBLESHOOTING DIGITAL CIRCUITS	1	0	0	0	3	0	0
L 714 L2-07 DO YOU ANALYZE LOGIC CIRCUITS BY USING BOOLEAN ALGEBRA	1	0	0	0	3	0	0
L 715 L2-08 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUIT GATES	1	1	0	0	3	0	0
L 716 L2-09 DO YOU USE OR REFER TO TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	1	1	0	0	3	0	0
L 717 L2-10 DO YOU USE OR REFER TO LOGIC DIAGRAMS CONSISTING OF MORE THAN ONE GATE	1	1	0	0	3	0	0
L 718 L2-11 DO YOU COMPUTE SUM AND CARRY EXPRESSIONS FOR SERIAL HALF OR FULL ADDER LOGIC DIAGRAMS	1	0	0	0	3	0	0

BOOLEAN EQUATIONS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DI-TSK	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
L 719 L2-12 DO YOU TRACE DATA FLOW THROUGH PARALLEL FULL ADDER LOGIC DIAGRAMS	1	0	0	0	3	0	0
L 720 L2-13 DO YOU WORK WITH ASTABLE (FREE RUNNING) MULTIVIBRATORS	2	1	3	0	3	0	5
L 721 L2-14 DO YOU WORK WITH BISTABLE (FLIP-FLOP) MULTIVIBRATORS	2	2	3	0	3	0	5
L 722 L2-15 DO YOU WORK WITH MONOSTABLE (ONE-SHOT) MULTIVIBRATORS	2	2	0	0	3	0	0
L 723 L2-16 DO YOU USE OR REFER TO FLIP-FLOP MULTIVIBRATOR SYMBOLS	2	2	0	0	3	0	0
L 724 L2-17 DO YOU USE OR REFER TO SINGLE-SHOT MULTIVIBRATOR SYMBOLS	1	1	0	0	3	0	0
L 725 L2-18 DO YOU USE OR REFER TO FLIP-FLOP CIRCUIT DIAGRAMS	1	1	0	0	3	0	0
L 726 L2-19 DO YOU USE OR REFER TO FLIP-FLOP TRUTH TABLES	1	1	0	0	3	0	0
L 727 L2-20 DO YOU USE OR REFER TO COMPLEMENTED FLIP-FLOP LOGIC SYMBOLS	1	1	0	0	3	0	0
L 728 L2-21 DO YOU USE OR REFER TO COMPLEMENTING FLIP-FLOP LOGIC SYMBOLS	1	1	0	0	3	0	0
L 729 L2-22 DO YOU MEASURE OUTPUT WAVESHAPES OF LOGIC CIRCUITS	2	1	3	0	3	0	5
L 730 L2-23 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTED FLIP-FLOP SCHEMATIC DIAGRAMS	1	1	0	0	3	0	0
L 731 L2-24 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTING FLIP-FLOP SCHEMATIC DIAGRAMS	1	1	0	0	3	0	0
L 732 L2-25 DO YOU CONSTRUCT TRUTH TABLES FOR J-K FLIP-FLOP LOGIC SYMBOLS	1	0	0	0	3	0	0
L 733 L3-01 DO YOU WORK WITH DIGITAL COUNTERS IN YOUR PRESENT JOB	6	5	6	4	8	3	5
L 734 L3-02 DO YOU USE OR REFER TO UP-COUNTERS	5	5	3	5	8	3	5
L 735 L3-03 DO YOU USE OR REFER TO DOWN-COUNTERS	4	5	3	5	8	0	5
L 736 L3-04 DO YOU USE OR REFER TO SERIAL COUNTERS	4	3	6	4	8	0	5
L 737 L3-05 DO YOU USE OR REFER TO PARALLEL COUNTERS	3	2	6	2	8	0	5
L 738 L3-06 DO YOU USE OR REFER TO RING COUNTERS	2	2	3	0	8	0	5
L 739 L3-07 DO YOU USE OR REFER TO DECADE COUNTERS	3	2	3	0	8	0	5
L 740 L3-08 DO YOU USE OR REFER TO COUNT DETECT CIRCUITS	3	2	6	0	8	0	5
L 741 L3-09 DO YOU USE OR REFER TO DOWN CLOCKS	3	3	3	4	8	0	5
L 742 L3-10 DO YOU USE OR REFER TO UP CLOCKS	4	5	3	4	8	3	5
L 743 L3-11 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	2	1	3	0	5	0	5
L 744 L3-12 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	2	1	3	0	5	0	5
L 745 L3-13 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF DECADE COUNTERS	2	2	3	0	5	0	5
L 746 L3-14 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF RING COUNTERS	2	1	3	0	5	0	5
L 747 L3-15 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	2	1	3	0	5	0	5
L 748 L3-16 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	2	1	3	0	5	0	5

COUNTERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DI-TSK

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
L 749 L3-17 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF COUNTERS	3	2	6	2	5	0	5
L 750 L3-18 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	2	1	3	0	5	0	5
L 751 L3-19 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTED	2	1	3	0	5	0	5
L 752 L3-20 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE	2	1	3	0	5	0	5
L 753 L3-21 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR OTHER TYPES OF COUNTERS	2	1	3	0	5	0	5
L 754 L3-22 DO YOU CONSTRUCT TRUTH TABLES FROM LOGIC DIAGRAMS OF DECADE COUNTERS	2	1	3	0	5	0	5
L 755 L3-23 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP IN RING COUNTERS FOR SPECIFIC INPUT PULSES	2	1	3	0	5	0	5
L 756 L3-24 DO YOU DETERMINE THE APPROPRIATE AND GATE NECESSARY IN COUNT DETECT CIRCUITS TO INDICATE A REQUIRED COUNT	2	1	3	0	5	0	5
M 757 MI-01 DO YOU WORK WITH SAWTOOTH WAVE GENERATORS	8	6	14	7	11	0	10
M 758 MI-02 DO YOU WORK WITH TRAPEZOIDAL WAVE GENERATORS	4	3	3	2	11	0	0
M 759 MI-03 DO YOU WORK WITH PULSED OSCILLATORS WITH REGENERATIVE FEEDBACK	6	4	8	2	11	0	5
M 760 MI-04 DO YOU WORK WITH PULSED OSCILLATORS WITHOUT REGENERATIVE FEEDBACK	6	3	11	2	11	0	10
M 761 MI-05 DO YOU WORK WITH BLOCKING OSCILLATORS	6	4	11	4	11	0	10
M 762 MI-06 DO YOU USE OR REFER TO RISE TIME	7	5	8	4	11	0	10
M 763 MI-07 DO YOU USE OR REFER TO FALL OR FLYBACK TIME	7	6	6	5	11	0	5
M 764 MI-08 DO YOU USE OR REFER TO SLEEP TIME	11	8	19	7	11	0	19
M 765 MI-09 DO YOU USE OR REFER TO ELECTRICAL LENGTH OF SAWTOOTH WAVEFORMS	9	8	11	7	11	0	5
M 766 MI-10 DO YOU USE OR REFER TO PHYSICAL LENGTH OF SAWTOOTH WAVEFORMS	7	6	6	5	11	0	5
M 767 MI-11 DO YOU USE OR REFER TO LINEAR SLOPE OF SAWTOOTH WAVEFORMS	7	6	6	5	11	0	5
M 768 MI-12 DO YOU USE OR REFER TO GATE LENGTH OF SAWTOOTH WAVEFORMS	5	5	0	4	11	0	0
M 769 M2-01 DO YOU USE SIGNAL GENERATORS IN YOUR PRESENT JOB	4	4	0	5	8	0	0
M 770 M2-02 DO YOU PERFORM OPERATIONAL CHECKS WHILE USING SIGNAL GENERATORS	3	3	0	4	8	0	0
M 771 M2-03 DO YOU PERFORM PERIODIC MAINTENANCE SUCH AS ADJUSTING, ALIGNING, OR CALIBRATING WHILE USING SIGNAL	2	1	0	0	8	0	0
M 772 M2-04 DO YOU TROUBLESHOOT TO AN ASSEMBLY OR SUBASSEMBLY WHILE USING SIGNAL GENERATORS	2	1	0	0	8	0	0
M 773 M2-05 DO YOU TROUBLESHOOT TO THE SMALLEST REPLACEABLE COMPONENT WHILE USING SIGNAL GENERATORS	1	0	0	0	5	0	0
M 774 M2-06 DO YOU USE AUDIO SINE-WAVE GENERATORS	2	1	0	0	5	0	0

TIMING CIRCUITS

USE OF SIGNAL GENERATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

BY-TASK	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
M 775 M2-07 DO YOU USE AUDIO NON-SINUSOIDAL WAVE GENERATORS SUCH AS SQUARE WAVE, TRIANGLE, PULSE, OR SPIKE	1	0	0	0	5	0	0
M 776 M2-08 DO YOU USE RF GENERATORS LESS THAN 1,000 MH	1	0	0	0	5	0	0
M 777 M2-09 DO YOU USE RF GENERATORS GREATER THAN 1,000 MH	1	0	0	0	5	0	0
M 778 M2-10 DO YOU USE OTHER SPECIAL PURPOSE OR MULTI-FUNCTION GENERATORS	3	2	0	5	5	0	0
M 779 M3-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH ALTERNATING CURRENT OR DIRECT CURRENT MOTORS OR	77	78	69	79	78	72	62
M 780 M3-02 DO YOU INSPECT MOTORS	77	78	72	73	81	72	67
M 781 M3-03 DO YOU CLEAN OR LUBRICATE MOTORS	76	78	72	75	81	72	67
M 782 M3-04 DO YOU OPERATE MOTORS	74	75	69	73	81	67	62
M 783 M3-05 DO YOU REMOVE OR REPLACE COMPLETE MOTORS	74	74	69	75	78	67	67
M 784 M3-06 DO YOU REMOVE OR REPLACE MOTOR PARTS	62	65	47	55	73	61	48
M 785 M3-07 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF MOTORS	76	76	69	75	81	72	62
M 786 M3-08 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF MOTORS	57	58	44	54	68	50	52
M 787 M3-09 DO YOU PERFORM ANY TASKS ON FIELD COILS	24	28	14	25	41	22	10
M 788 M3-10 DO YOU PERFORM ANY TASKS ON ARMATURES	37	38	33	34	49	25	38
M 789 M3-11 DO YOU PERFORM ANY TASKS ON ROTORS	34	42	25	39	49	28	19
M 790 M3-12 DO YOU PERFORM ANY TASKS ON BRUSHES	59	60	50	54	62	53	48
M 791 M3-13 DO YOU PERFORM ANY TASKS ON SLIP RINGS	29	30	22	25	32	31	24
M 792 M3-14 DO YOU PERFORM ANY TASKS ON COMMUTATORS	30	33	19	21	46	33	19
M 793 M3-15 DO YOU PERFORM ANY TASKS ON POLE PIECES	23	25	17	18	30	25	14
M 794 M3-16 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OF THE FORCE OR TORQUE CREATED BY A MOTOR	13	13	11	13	19	6	10
M 795 M3-17 DO YOU DETERMINE OR MEASURE THE DIRECTION OF THE MECHANICAL FORCE OR TORQUE CREATED BY A MOTOR	19	19	11	21	24	6	14
M 796 M3-18 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OR DIRECTION OF THE INDUCED VOLTAGE IN MOTORS	12	11	11	11	19	0	19
M 797 M3-19 DO YOU WORK WITH SYNCHRONOUS MOTORS	27	29	17	14	49	22	14
M 798 M3-20 DO YOU WORK WITH INDUCTION MOTORS	35	37	31	27	41	31	33
M 799 M3-21 DO YOU WORK WITH SPLIT-PHASE MOTORS	32	33	25	32	38	19	19
M 800 M3-22 DO YOU WORK WITH SOME COMBINATION OF THE ABOVE MOTORS	50	49	53	50	51	42	48
M 801 M3-23 DO YOU INSPECT GENERATORS	18	17	19	20	16	17	19
M 802 M3-24 DO YOU CLEAN OR LUBRICATE GENERATORS	18	17	19	18	16	17	19
M 803 M3-25 DO YOU OPERATE GENERATORS	25	23	33	34	16	14	38
M 804 M3-26 DO YOU REMOVE OR REPLACE COMPLETE GENERATORS	12	13	8	11	16	17	5
M 805 M3-27 DO YOU REMOVE OR REPLACE GENERATOR PARTS	12	12	8	11	16	14	5
M 806 M3-28 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF GENERATORS	17	17	17	20	16	17	14
M 807 M3-29 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF GENERATORS	13	13	11	13	16	11	10
M 808 M1-01 DO YOU WORK WITH METERS IN YOUR PRESENT JOB	67	65	72	70	54	58	76
M 809 M1-02 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF PERMANENT MAGNETS	14	14	14	11	19	6	14
M 810 M1-03 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF MOVING COILS	13	12	11	9	19	6	19

MOTORS AND GENERATORS

METER MOVEMENTS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

DESCRIPTION	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
N 811 NI-04 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF SPIRAL SPRINGS	14	15	8	11	19	11	14
N 812 NI-05 DO YOU READ METER SCALES	69	67	69	71	59	58	71
N 813 NI-06 DO YOU EXTEND THE RANGE OF AMMETERS	18	15	19	14	24	6	24
N 814 NI-07 DO YOU ZERO OHMMETERS	70	68	72	73	59	58	76
N 815 NI-08 DO YOU ZERO AMMETERS	35	35	31	30	32	31	33
N 816 NI-09 DO YOU EXTEND THE RANGE OF VOLTMETERS	25	19	36	21	24	14	43
N 817 NI-10 DO YOU USE OR REFER TO VOLTMETER SENSITIVITY (EXPRESSED IN UNITS OF OHMS PER VOLT)	35	33	31	38	22	22	33
N 818 N2-01 DO YOU WORK WITH SATURABLE REACTORS OR MAGNETIC AMPLIFIERS IN YOUR PRESENT JOB	1	1	0	0	5	0	0
N 819 N2-02 DO YOU INSPECT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	1	1	0	0	5	0	0
N 820 N2-03 DO YOU CLEAN MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	1	1	0	0	5	0	0
N 821 N2-04 DO YOU ADJUST MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	1	1	0	0	5	0	0
N 822 N2-05 DO YOU TROUBLESHOOT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	1	1	0	0	5	0	0
N 823 N2-06 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	1	1	0	0	5	0	0
N 824 N2-07 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIER OR SATURABLE REACTOR COMPONENTS	1	1	0	0	5	0	0
N 825 N2-08 DO YOU USE OR REFER TO HYSTERESIS CURVES OR LOOPS	1	1	0	0	5	0	0
N 826 N2-09 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	1	1	0	0	5	0	0
N 827 N2-10 DO YOU MEASURE OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	1	1	0	0	5	0	0
N 828 N2-11 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS FOR MAGNETIC AMPLIFIERS	1	0	0	0	3	0	0
N 829 N2-12 DO YOU USE OR REFER TO COERCIVE FORCE IN SATURABLE REACTORS	1	0	0	0	3	0	0
N 830 N2-13 DO YOU USE OR REFER TO RESIDUAL MAGNETISM IN SATURABLE REACTORS	1	0	0	0	3	0	0
N 831 N2-14 DO YOU USE OR REFER TO FLUX DENSITY IN SATURABLE REACTORS	1	0	0	0	3	0	0
N 832 N2-15 DO YOU USE OR REFER TO POINT OF SATURATION IN SATURABLE REACTORS	1	0	0	0	3	0	0
N 833 N2-16 DO YOU USE OR REFER TO SATURABLE REACTOR SCHEMATIC SYMBOLS	1	0	0	0	3	0	0
N 834 N3-01 DO YOU WORK WITH WAVESHAPING CIRCUITS IN YOUR PRESENT JOB	4	4	3	7	3	3	0
N 835 N3-02 DO YOU USE OR REFER TO TRANSIENT INTERVALS	1	1	0	2	3	0	0
N 836 N3-03 DO YOU USE OR REFER TO PULSE WIDTH (PW)	1	0	0	0	3	0	0
N 837 N3-04 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	1	0	0	0	3	0	0

WAVESHAPING
CIRCUITS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

Task ID	Description	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
N 838	N3-05 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRE)	1	0	0	0	3	0	0
N 839	N3-06 DO YOU USE OR REFER TO DIFFERENTIATING CIRCUITS	1	1	0	2	0	0	0
N 840	N3-07 DO YOU USE OR REFER TO INTEGRATING CIRCUITS	2	2	0	4	3	0	0
N 841	N3-08 DO YOU USE OR REFER TO THE CLASSIFICATION OF TIME CONSTANTS (TC) AS LONG, MEDIUM, OR SHORT	1	0	0	0	3	0	0
N 842	N3-09 DO YOU DETERMINE WHETHER AN LR OR RC CIRCUIT IS DIFFERENTIATING OR INTEGRATING BASED ON THE TIME CONSTANT	1	1	0	2	3	0	0
N 843	N3-10 DO YOU WORK WITH SQUARE WAVE GENERATORS	3	3	0	5	3	3	0
N 844	N3-11 DO YOU WORK WITH RECTANGULAR WAVE GENERATORS	2	2	0	4	3	3	0
0 845	01-01 DO YOU WORK ON SINGLE SIDEBAND SYSTEMS IN YOUR PRESENT JOB	1	0	0	0	3	0	0
0 846	01-02 DO YOU INSPECT SSB TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
0 847	01-03 DO YOU CLEAN SSB TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
0 848	01-04 DO YOU ALIGN SSB TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
0 849	01-05 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
0 850	01-06 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE COMPONENTS	1	0	0	0	3	0	0
0 851	01-07 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE SYSTEMS	1	0	0	0	3	0	0
0 852	01-08 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE COMPONENTS	1	0	0	0	3	0	0
0 853	01-09 DO YOU PERFORM TASKS ON SSB AUDIO AMPLIFIERS	1	0	0	0	3	0	0
0 854	01-10 DO YOU PERFORM TASKS ON SSB BALANCED MODULATORS	1	0	0	0	3	0	0
0 855	01-11 DO YOU PERFORM TASKS ON SSB CARRIER OSCILLATORS	1	0	0	0	3	0	0
0 856	01-12 DO YOU PERFORM TASKS ON SSB LC FILTERS	1	0	0	0	3	0	0
0 857	01-13 DO YOU PERFORM TASKS ON SSB CRYSTAL FILTERS	1	0	0	0	3	0	0
0 858	01-14 DO YOU PERFORM TASKS ON SSB MECHANICAL FILTERS	1	0	0	0	3	0	0
0 859	01-15 DO YOU PERFORM TASKS ON SSB OSCILLATORS	1	0	0	0	3	0	0
0 860	01-16 DO YOU PERFORM TASKS ON SSB MIXERS	1	0	0	0	3	0	0
0 861	01-17 DO YOU PERFORM TASKS ON SSB DRIVERS	1	0	0	0	3	0	0
0 862	01-18 DO YOU PERFORM TASKS ON SSB POWER AMPLIFIERS	1	0	0	0	3	0	0
0 863	01-19 DO YOU PERFORM TASKS ON SSB HF AMPLIFIERS	1	0	0	0	3	0	0
0 864	01-20 DO YOU PERFORM TASKS ON SSB FREQUENCY CONVERTERS	1	0	0	0	3	0	0
0 865	01-21 DO YOU PERFORM TASKS ON SSB IF AMPLIFIERS	1	0	0	0	3	0	0
0 866	01-22 DO YOU PERFORM TASKS ON SSB DEMODULATORS	1	0	0	0	3	0	0
0 867	01-23 DO YOU PERFORM TASKS ON SSB DON'T REMEMBER WHICH SSB SYSTEM STAGES	1	0	0	0	3	0	0
0 868	01-24 DO YOU USE OR REFER TO SELECTIVE FADING	1	0	0	0	3	0	0
0 869	01-25 DO YOU USE OR REFER TO PEAK POWER	1	0	0	0	3	0	0
0 870	01-26 DO YOU USE OR REFER TO FREQUENCY STABILITY	1	0	0	0	3	0	0
0 871	01-27 DO YOU USE OR REFER TO RESPONSE CURVES FOR BANDWIDTH FILTERS	1	0	0	0	3	0	0
0 872	01-28 DO YOU CALCULATE PEAK POWER OR EFFECTIVE POWER OF SSB TRANSMITTERS	1	0	0	0	3	0	0

SINGLE SIDEBAND SYSTEMS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DT-TASK	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
0 873 01-29 00 YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB TRANSMITTER SCHEMATIC DIAGRAMS	1	0	0	0	3	0	0
0 874 01-30 00 YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB RECEIVER SCHEMATIC DIAGRAMS	1	0	0	0	3	0	0
0 875 02-01 00 YOU WORK ON PULSE MODULATION SYSTEMS IN YOUR PRESENT JOB	1	0	0	0	5	0	0
0 876 02-02 00 YOU INSPECT PULSE MODULATION SYSTEMS	1	0	0	0	5	0	0
0 877 02-03 00 YOU CLEAN PULSE MODULATION SYSTEMS	1	0	0	0	5	0	0
0 878 02-04 00 YOU ALIGN PULSE MODULATION SYSTEMS	1	0	0	0	5	0	0
0 879 02-05 00 YOU TROUBLESHOOT TO PULSE MODULATION SYSTEMS	1	0	0	0	5	0	0
0 880 02-06 00 YOU TROUBLESHOOT TO PULSE MODULATION SYSTEM COMPONENTS	1	0	0	0	5	0	0
0 881 02-07 00 YOU REMOVE OR REPLACE PULSE MODULATION SYSTEMS	1	0	0	0	5	0	0
0 882 02-08 00 YOU REMOVE OR REPLACE PULSE MODULATION SYSTEM COMPONENTS	1	0	0	0	5	0	0
0 883 02-09 00 YOU WORK ON PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS	1	0	0	0	5	0	0
0 884 02-10 00 YOU WORK ON PULSE-DURATION MODULATION (PDM) SYSTEMS	1	0	0	0	5	0	0
0 885 02-11 00 YOU WORK ON PULSE-POSITION MODULATION (PPM) SYSTEMS	1	0	0	0	5	0	0
0 886 02-12 00 YOU WORK ON PULSE-CODE MODULATION (PCM) SYSTEMS	1	0	0	0	5	0	0
0 887 02-13 00 YOU WORK ON LINE PULSING MODULATION SYSTEMS	1	0	0	0	5	0	0
0 888 02-14 00 YOU WORK ON DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM	2	1	0	0	5	3	0
0 889 02-15 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER SUPPLIES	1	0	0	0	5	0	0
0 890 02-16 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM CHARGING CHOKES AND CHARGING DIODES	1	0	0	0	5	0	0
0 891 02-17 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE FORMING NETWORKS	1	0	0	0	5	0	0
0 892 02-18 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TIMERS	2	1	0	0	5	3	0
0 893 02-19 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM SWITCHES SUCH AS GAS THYRATRONS	1	0	0	0	5	0	0
0 894 02-20 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE TRANSFORMERS	1	0	0	0	5	0	0
0 895 02-21 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TRANSMITTER TUBES	1	0	0	0	5	0	0
0 896 02-22 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM RF AMPLIFIERS	1	0	0	0	5	0	0
0 897 02-23 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM FREQUENCY CONVERTERS	1	0	0	0	5	0	0
0 898 02-24 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM IF AMPLIFIERS	1	0	0	0	5	0	0
0 899 02-25 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DETECTORS	1	0	0	0	5	0	0

PULSE MODULATION
SYSTEMS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSA

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
0 900 02-26 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM VIDEO AMPLIFIERS	1	0	0	0	5	0	0
0 901 02-27 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER VIDEO AMPLIFIERS	1	0	0	0	5	0	0
0 902 02-28 00 YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DON'T REMEMBER WHICH PULSE MODULATION SYSTEM STAGES	1	0	0	0	5	0	0
0 903 02-29 00 YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	1	0	0	0	3	0	0
0 904 02-30 00 YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	1	0	0	0	3	0	0
0 905 02-31 00 YOU USE OR REFER TO PULSE WIDTH (PW)	1	0	0	0	3	0	0
0 906 02-32 00 YOU USE OR REFER TO PULSE SHAPE	1	0	0	0	3	0	0
0 907 02-33 00 YOU USE OR REFER TO PEAK POWER	1	0	0	0	3	0	0
0 908 02-34 00 YOU USE OR REFER TO AVERAGE POWER	1	0	0	0	3	0	0
0 909 02-35 00 YOU CALCULATE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	1	0	0	0	3	0	0
0 910 02-36 00 YOU MEASURE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	1	0	0	0	3	0	0
0 911 02-37 00 YOU USE FORMULAS TO CALCULATE AVERAGE POWER OR PEAK POWER OF PULSE MODULATION TRANSMIT SYSTEMS	1	0	0	0	3	0	0
0 912 02-38 00 YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION TRANSMITTER SCHEMATIC DIAGRAMS	1	0	0	0	3	0	0
0 913 02-39 00 YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION RECEIVER SCHEMATIC DIAGRAMS	1	0	0	0	3	0	0
0 914 03-01 00 YOU WORK WITH ANTENNAS IN YOUR PRESENT JOB	1	0	0	0	3	0	0
0 915 03-02 00 YOU INSPECT ANTENNAS	1	0	0	0	3	0	0
0 916 03-03 00 YOU CLEAN ANTENNAS	1	0	0	0	3	0	0
0 917 03-04 00 YOU PHYSICALLY ALIGN ANTENNAS	1	0	0	0	3	0	0
0 918 03-05 00 YOU ELECTRICALLY ALIGN ANTENNAS	1	0	0	0	3	0	0
0 919 03-06 00 YOU TROUBLESHOOT TO ANTENNAS	1	0	0	0	3	0	0
0 920 03-07 00 YOU TROUBLESHOOT TO ANTENNA COMPONENTS	1	0	0	0	3	0	0
0 921 03-08 00 YOU REMOVE OR INSTALL ANTENNAS	1	0	0	0	3	0	0
0 922 03-09 00 YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	1	0	0	0	3	0	0
0 923 03-10 00 YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF E OR ELECTRIC FIELD LINES	1	0	0	0	3	0	0
0 924 03-11 00 YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF H OR MAGNETIC FIELD LINES	1	0	0	0	3	0	0
0 925 03-12 00 YOU DETERMINE THE DIRECTION OF THE MAGNETIC LINES IN RELATION TO THE ELECTRIC LINES OF FORCE FOR ANTENNAS	1	0	0	0	3	0	0
0 926 03-13 00 YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE OF CORRECT LENGTH (HALF-WAVE) ACT AS	1	0	0	0	3	0	0
0 927 03-14 00 YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE LONGER THAN A HALF-WAVE ACT AS INDUCTIVE LOADS	1	0	0	0	3	0	0
0 928 03-15 00 YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE SHORTER THAN A HALF-WAVE ACT AS CAPACITIVE LOADS	1	0	0	0	3	0	0

ANTENNAS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

Task Description	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
0 929 03-16 DO YOU WORK WITH HERTZ ANTENNAS	1	0	0	0	3	0	0
0 930 03-17 DO YOU WORK WITH MARCONI ANTENNAS	1	0	0	0	3	0	0
0 931 03-18 DO YOU WORK WITH BROADSIDE ARRAYS	1	0	0	0	3	0	0
0 932 03-19 DO YOU WORK WITH END-FIRE ARRAYS	1	0	0	0	3	0	0
0 933 03-20 DO YOU WORK WITH CARDIODS ARRAYS	1	0	0	0	3	0	0
0 934 03-21 DO YOU WORK WITH COLLINER ARRAYS	1	0	0	0	3	0	0
0 935 03-22 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC INDUCTION FIELDS WHEN WORKING WITH ANTENNAS	1	0	0	0	3	0	0
0 936 03-23 DO YOU MEASURE ELECTROMAGNETIC INDUCTION FIELDS OF ANTENNAS	1	0	0	0	3	0	0
0 937 03-24 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC RADIATION FIELDS WHEN WORKING WITH ANTENNAS	1	0	0	0	3	0	0
0 938 03-25 DO YOU MEASURE ELECTROMAGNETIC RADIATION FIELDS OF ANTENNAS	1	0	0	0	3	0	0
0 939 03-26 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA RADIATION	1	0	0	0	3	0	0
0 940 03-27 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA INDUCTION FIELD	1	0	0	0	3	0	0
0 941 03-28 ARE ANY OF THE ANTENNAS YOU WORK ON LINEARLY POLARIZED	1	0	0	0	3	0	0
0 942 03-29 ARE ANY OF THE ANTENNAS YOU WORK ON CIRCULARLY POLARIZED	1	0	0	0	3	0	0
0 943 03-30 DO YOU MEASURE OR DETERMINE THE POLARITY OF ANTENNAS YOU WORK ON	1	0	0	0	3	0	0
0 944 03-31 DO YOU CONSTRUCT, OR MAKE THE CALCULATIONS NECESSARY TO CONSTRUCT, ANTENNAS OF CORRECT LENGTH FOR ELEMENTS	1	0	0	0	3	0	0
0 945 03-32 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS	1	0	0	0	3	0	0
0 946 03-33 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS DIRECTORS	1	0	0	0	3	0	0
0 947 03-34 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS REFLECTORS	1	0	0	0	3	0	0
0 948 03-35 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN DON'T REMEMBER WHAT KIND OF ELEMENTS	1	0	0	0	3	0	0
0 949 03-36 DO YOU WORK ON UNIDIRECTIONAL ANTENNAS	1	0	0	0	3	0	0
0 950 03-37 DO YOU WORK ON BIDIRECTIONAL ANTENNAS	1	0	0	0	3	0	0
0 951 03-38 DO YOU WORK ON DON'T REMEMBER THE DIRECTIONALITY	1	0	0	0	3	0	0
0 952 03-39 DO YOU WORK WITH ROTAR ANTENNA ARRAYS	1	0	0	0	3	0	0
P 953 PI-01 IN YOUR PRESENT JOB DO YOU WORK WITH TRANSMISSION LINES (TRANSMISSION LINES ARE DEFINED TO INCLUDE LEADS IN TRANSMISSION LINES)	3	3	0	4	3	0	0
P 954 PI-02 DO YOU REFER TO OR USE COPPER LOSS OR I2R LOSS IN TRANSMISSION LINES	2	2	0	0	3	0	0
P 955 PI-03 DO YOU REFER TO OR USE SKIN EFFECTS OF HIGH FREQUENCY CURRENTS IN TRANSMISSION LINES	1	0	0	0	3	0	0

TRANSMISSION
LINES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
P 981 P1-29 DO YOU WORK WITH NONRESONANT (FLAT) TRANSMISSION LINES	1	1	0	2	3	0	0
P 982 P1-30 DO YOU WORK WITH RESONANT TRANSMISSION LINES	1	0	0	0	3	0	0
P 983 P1-31 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING STUB MATCHING	1	0	0	0	3	0	0
P 984 P2-01 DO YOU WORK WITH WAVEGUIDES OR CAVITY RESONATORS IN YOUR PRESENT JOB	1	0	0	0	3	0	0
P 985 P2-02 DO YOU INSPECT WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 986 P2-03 DO YOU CLEAN WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 987 P2-04 DO YOU BEND WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 988 P2-05 DO YOU TWIST WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 989 P2-06 DO YOU PRESSURIZE WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 990 P2-07 DO YOU PURGE WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 991 P2-08 DO YOU TROUBLESHOOT WAVEGUIDES OR CAVITY RESONATORS	1	0	0	0	3	0	0
P 992 P2-09 DO YOU REMOVE OR INSTALL COMPLETE WAVEGUIDES	1	0	0	0	3	0	0
P 993 P2-10 DO YOU REMOVE OR INSTALL WAVEGUIDE SECTIONS	1	0	0	0	3	0	0
P 994 P2-11 DO YOU REMOVE OR INSTALL DUMMY LOADS	1	0	0	0	3	0	0
P 995 P2-12 DO YOU REMOVE OR INSTALL E BENDS	1	0	0	0	3	0	0
P 996 P2-13 DO YOU REMOVE OR INSTALL M BENDS	1	0	0	0	3	0	0
P 997 P2-14 DO YOU REMOVE OR INSTALL OTHER BENDS	1	0	0	0	3	0	0
P 998 P2-15 DO YOU REMOVE OR INSTALL CHOKED JOINTS	1	0	0	0	3	0	0
P 999 P2-16 DO YOU REMOVE OR INSTALL ROTATING JOINTS	1	0	0	0	3	0	0
P1000 P2-17 DO YOU REMOVE OR INSTALL DIRECTIONAL COUPLERS	1	0	0	0	3	0	0
P1001 P2-18 DO YOU REMOVE OR INSTALL BIDIRECTIONAL COUPLERS	1	0	0	0	3	0	0
P1002 P2-19 DO YOU USE OR REFER TO "A" WALL OF WAVEGUIDES	1	0	0	0	3	0	0
P1003 P2-20 DO YOU USE OR REFER TO "B" WALL OF WAVEGUIDES	1	0	0	0	3	0	0
P1004 P2-21 DO YOU USE OR REFER TO CUTOFF FREQUENCY OF WAVEGUIDES	1	0	0	0	3	0	0
P1005 P2-22 DO YOU USE OR REFER TO FREQUENCY-DETERMINING WALL OF WAVEGUIDES	1	0	0	0	3	0	0
P1006 P2-23 DO YOU USE OR REFER TO POWER-DETERMINING WALL OF WAVEGUIDES	1	0	0	0	3	0	0
P1007 P2-24 DO YOU USE OR REFER TO ELECTRIC FIELD BOUNDARY CONDITIONS	1	0	0	0	3	0	0
P1008 P2-25 DO YOU USE OR REFER TO MAGNETIC FIELD BOUNDARY CONDITIONS	1	0	0	0	3	0	0
P1009 P2-26 DO YOU USE OR REFER TO DUPLEXER FIELD BOUNDARY CONDITIONS	1	0	0	0	3	0	0
P1010 P2-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST WAVEGUIDES ARE MADE WITH A "B" WALL SIZE OF .7 WAVELENGTHS	1	0	0	0	3	0	0
P1011 P2-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST "A" WALLS RANGE FROM .2 TO .5 WAVELENGTHS IN SIZE, WITH .35 WAVELENGTHS	1	0	0	0	3	0	0
P1012 P2-29 ARE YOU CONCERNED WITH THE MATERIAL (SUCH AS BRASS) WHICH WAVEGUIDES ARE MADE OF	1	0	0	0	3	0	0
P1013 P2-30 DO YOU COMPUTE THE LENGTH OF A WAVEGUIDE FOR SPECIFIC INSTALLATION	1	0	0	0	3	0	0

WAVEGUIDES AND
CAVITY RESONATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

SPC 003 SPC 007 SPC 008 SPC 009 SPC 010 SPC 011 SPC 012

Item	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
P1014 P2-31 DO YOU USE THE RIGHT HAND RULE TO DETERMINE THE DIRECTION OF PROPAGATION, DIRECTION OF "E" FIELD, OR	1	0	0	0	3	0	0
P1015 P2-32 DO YOU USE OR REFER TO THE TIME PHASE OF PEAK "E" OR "H" LINES IN WAVEGUIDES	1	0	0	0	3	0	0
P1016 P2-33 DO YOU MEASURE THE TIME PHASE OF "E" OR "H" LINES IN WAVEGUIDES	1	0	0	0	3	0	0
P1017 P2-34 DO YOU USE OR REFER TO THE SPACE QUADRATURE OF "E" OR "H" LINES IN WAVEGUIDES	1	0	0	0	3	0	0
P1018 P2-35 ARE HIGH POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1019 P2-36 ARE LOW POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1020 P2-37 ARE LOOPS USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1021 P2-38 ARE APERTURES (WINDOWS OR IRISES) USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1022 P2-39 ARE DON'T REMEMBER THE KIND OF ENERGY COUPLING USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1023 P2-40 DO YOU DETERMINE WHERE PROBES SHOULD BE MOUNTED IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO	1	0	0	0	3	0	0
P1024 P2-41 DO YOU DETERMINE THE POSITIONING OF LOOPS IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO	1	0	0	0	3	0	0
P1025 P2-42 DO YOU DETERMINE THE POSITIONING OR SIZE OF APERTURES IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO	1	0	0	0	3	0	0
P1026 P2-43 ARE CHOKE JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1027 P2-44 ARE ROTATING JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1028 P2-45 ARE DON'T REMEMBER THE KIND OF JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	1	0	0	0	3	0	0
P1029 P2-46 DO YOU TUNE CAVITY RESONATORS USING CAPACITIVE TUNING	1	0	0	0	3	0	0
P1030 P2-47 DO YOU TUNE CAVITY RESONATORS USING INDUCTIVE TUNING	1	0	0	0	3	0	0
P1031 P2-48 DO YOU TUNE CAVITY RESONATORS USING VOLUME TUNING	1	0	0	0	3	0	0
P1032 P2-49 DO YOU TUNE CAVITY RESONATORS USING DON'T REMEMBER THE METHOD OF TUNING	1	0	0	0	3	0	0
P1033 P2-50 DO YOU MEASURE THE FREQUENCY OF SIGNALS IN CAVITY RESONATORS	1	0	0	0	3	0	0
P1034 P3-01 IN YOUR PRESENT JOB DO YOU WORK WITH KLYSTRONS, TRAVELING WAVE TUBES (TWT), PARAMETRIC AMPLIFIERS, OR	1	0	0	0	3	0	0
P1035 P3-02 DO YOU USE OR REFER TO INTERELECTRODE CAPACITANCE	1	0	0	0	3	0	0
P1036 P3-03 DO YOU USE OR REFER TO ELECTRON TRANSIT TIME	1	0	0	0	3	0	0
P1037 P3-04 DO YOU USE OR REFER TO LEAD INDUCTANCE	1	0	0	0	3	0	0

MICROWAVE AMPLIFIERS
AND OSCILLATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSA

	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
P1038 P3-05 DO YOU USE OR REFER TO RF LOSSES IN EXTERNAL CIRCUITRY	1	0	0	0	3	0	0
P1039 P3-06 DO YOU USE OR REFER TO PRINCIPLE OF ELECTRON VELOCITY MODULATION	1	0	0	0	3	0	0
P1040 P3-07 DO YOU USE OR REFER TO ELECTRON BUNCHING	1	0	0	0	3	0	0
P1041 P3-08 DO YOU WORK WITH TWO-CAVITY KLYSTRONS	1	0	0	0	3	0	0
P1042 P3-09 DO YOU WORK WITH THREE-CAVITY KLYSTRONS	1	0	0	0	3	0	0
P1043 P3-10 DO YOU WORK WITH REFLEX KLYSTRONS	1	0	0	0	3	0	0
P1044 P3-11 DO YOU WORK WITH TRAVELING-WAVE TUBES (TWT)	1	0	0	0	3	0	0
P1045 P3-12 DO YOU WORK WITH NONDEGENERATIVE PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1046 P3-13 DO YOU WORK WITH UP-CONVERTER PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1047 P3-14 DO YOU WORK WITH MAGNETRONS	1	0	0	0	3	0	0
P1048 P3-15 DO YOU INSPECT KLYSTRONS OR TWT	1	0	0	0	3	0	0
P1049 P3-16 DO YOU CLEAN KLYSTRONS OR TWT	1	0	0	0	3	0	0
P1050 P3-17 DO YOU TUNE KLYSTRONS OR TWT ELECTRICALLY	1	0	0	0	3	0	0
P1051 P3-18 DO YOU TUNE KLYSTRONS OR TWT MECHANICALLY	1	0	0	0	3	0	0
P1052 P3-19 DO YOU PERFORM OPERATIONAL CHECKS OF KLYSTRONS OR TWT	1	0	0	0	3	0	0
P1053 P3-20 DO YOU TROUBLESHOOT KLYSTRONS OR TWT	1	0	0	0	3	0	0
P1054 P3-21 DO YOU REMOVE OR REPLACE COMPLETE KLYSTRON OR TWT	1	0	0	0	3	0	0
P1055 P3-22 DO YOU REMOVE OR REPLACE KLYSTRON OR TWT COMPONENTS	1	0	0	0	3	0	0
P1056 P3-23 DO YOU INSPECT PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1057 P3-24 DO YOU CLEAN PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1058 P3-25 DO YOU ADJUST PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1059 P3-26 DO YOU TUNE PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1060 P3-27 DO YOU PERFORM OPERATIONAL CHECKS OF PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1061 P3-28 DO YOU TROUBLESHOOT PARAMETRIC AMPLIFIERS	1	0	0	0	3	0	0
P1062 P3-29 DO YOU REMOVE OR REPLACE COMPLETE PARAMETRIC AMPLIFIER	1	0	0	0	3	0	0
P1063 P3-30 DO YOU REMOVE OR REPLACE PARAMETRIC AMPLIFIER COMPONENTS	1	0	0	0	3	0	0
P1064 P3-31 DO YOU INSPECT MAGNETRONS	1	0	0	0	3	0	0
P1065 P3-32 DO YOU CLEAN MAGNETRONS	1	0	0	0	3	0	0
P1066 P3-33 DO YOU ADJUST MAGNETRONS	1	0	0	0	3	0	0
P1067 P3-34 DO YOU TUNE MAGNETRONS	1	0	0	0	3	0	0
P1068 P3-35 DO YOU PERFORM OPERATIONAL CHECKS OF MAGNETRONS	1	0	0	0	3	0	0
P1069 P3-36 DO YOU TROUBLESHOOT MAGNETRONS	1	0	0	0	3	0	0
P1070 P3-37 DO YOU REMOVE OR REPLACE COMPLETE MAGNETRON	1	0	0	0	3	0	0
P1071 P3-38 DO YOU REMOVE OR REPLACE MAGNETRON COMPONENTS	1	0	0	0	3	0	0
P1072 P3-39 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS COLLECTOR PLATES	1	0	0	0	3	0	0
P1073 P3-40 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER CAVITIES	1	0	0	0	3	0	0
P1074 P3-41 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER GRIDS	1	0	0	0	3	0	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSA

	SPC 003	SPC 007	SPC U08	SPC 009	SPC 010	SPC 011	SPC 012
P1075 P3-42 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS FEEDBACK LOOPS	1	0	0	0	3	0	0
P1076 P3-43 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS DRIFT SPACES	1	0	0	0	3	0	0
P1077 P3-44 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER GRIDS	1	0	0	0	3	0	0
P1078 P3-45 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER CAVITIES	1	0	0	0	3	0	0
P1079 P3-46 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CONTROL GRIDS	1	0	0	0	3	0	0
P1080 P3-47 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATHODES	1	0	0	0	3	0	0
P1081 P3-48 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON REPELLER (REFLECTOR) PLATES	1	0	0	0	3	0	0
P1082 P3-49 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRIDS	1	0	0	0	3	0	0
P1083 P3-50 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRID CAVITY GAPS	1	0	0	0	3	0	0
P1084 P3-51 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON RESONANT CAVITIES	1	0	0	0	3	0	0
P1085 P3-52 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON MAGNETIC COUPLING LOOPS	1	0	0	0	3	0	0
P1086 P3-53 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON FILAMENTS	1	0	0	0	3	0	0
P1087 P3-54 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON CATHODES	1	0	0	0	3	0	0
P1088 P3-55 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON OUTPUT LEADS	1	0	0	0	3	0	0
P1089 P3-56 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES FILAMENTS	1	0	0	0	3	0	0
P1090 P3-57 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES CATHODES	1	0	0	0	3	0	0
P1091 P3-58 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MODULATOR GRIDS	1	0	0	0	3	0	0
P1092 P3-59 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ANODES	1	0	0	0	3	0	0
P1093 P3-60 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES HELICES	1	0	0	0	3	0	0
P1094 P3-61 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES COLLECTORS	1	0	0	0	3	0	0
P1095 P3-62 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MAGNETS	1	0	0	0	3	0	0
P1096 P3-63 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ATTENUATORS	1	0	0	0	3	0	0
P1097 P3-64 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE CIRCULATORS	1	0	0	0	3	0	0
P1098 P3-65 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER SIGNAL CAVITIES	1	0	0	0	3	0	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

Task ID	Description	SPC 003	SPC 007	SPC 008	SPC 009	SPC 010	SPC 011	SPC 012
P1099	P3-66 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER IDLER CAVITIES	1	0	0	0	3	0	0
P1100	P3-67 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER VARACTOR DIODES	1	0	0	0	3	0	0
P1101	P3-68 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE ISOLATORS	1	0	0	0	3	0	0
P1102	P3-69 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER REVERSE-BIAS BATTERIES	1	0	0	0	3	0	0
P1103	P3-70 DO YOU PERFORM TASKS ON ANODES	1	0	0	0	3	0	0
P1104	P3-71 DO YOU PERFORM TASKS ON ANODE COOLING PINS	1	0	0	0	3	0	0
P1105	P3-72 DO YOU PERFORM TASKS ON COUPLING LOOPS	1	0	0	0	3	0	0
P1106	P3-73 DO YOU PERFORM TASKS ON HEATER LEADS	1	0	0	0	3	0	0
P1107	P3-74 DO YOU PERFORM TASKS ON RESONANT CAVITIES	1	0	0	0	3	0	0
P1108	P3-75 DO YOU PERFORM TASKS ON CATMODES	1	0	0	0	3	0	0
P1109	P3-76 DO YOU PERFORM TASKS ON MAGNETS	1	0	0	0	3	0	0
Q1110	Q1-01 DO YOU USE OR REFER TO STORAGE REGISTERS	3	2	3	0	5	0	0
Q1111	Q1-02 DO YOU USE OR REFER TO SHIFT REGISTERS	1	1	0	0	5	0	0
Q1112	Q1-03 DO YOU USE OR REFER TO LOGIC SYMBOLS OF SHIFT REGISTERS	1	1	0	0	5	0	0
Q1113	Q1-04 DO YOU USE OR REFER TO LOGIC SYMBOLS OF STORAGE REGISTERS	2	1	3	0	5	0	0
Q1114	Q1-05 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	1	0	0	0	3	0	0
Q1115	Q1-06 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF REGISTERS	1	0	0	0	3	0	0
Q1116	Q1-07 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP OF A SHIFT REGISTER AFTER A SPECIFIED NUMBER OF SHIFT PULSES	1	0	0	0	3	0	0
Q1117	Q2-01 DO YOU WORK WITH DIGITAL COUNTERS, REGISTERS, OR STORAGE DEVICES IN YOUR PRESENT JOB	2	1	6	0	3	0	5
Q1118	Q2-02 DO YOU USE OR REFER TO DELAY LINES	1	0	3	0	3	0	5
Q1119	Q2-03 DO YOU USE OR REFER TO MAGNETIC CORES	1	0	0	0	3	0	0
Q1120	Q2-04 DO YOU USE OR REFER TO MAGNETIC DRUMS	1	0	0	0	3	0	0
Q1121	Q2-05 DO YOU USE OR REFER TO MAGNETIC TAPES	2	0	3	0	5	0	5
Q1122	Q2-06 DO YOU USE OR REFER TO ACCESS TIME OR SPEED OR MEMORY SYSTEMS	2	0	6	0	3	0	5
Q1123	Q2-07 DO YOU USE OR REFER TO WORD CAPACITY OF MEMORY SYSTEMS	1	0	3	0	3	0	5
Q1124	Q2-08 DO YOU USE OR REFER TO VOLATILITY OF MEMORY SYSTEMS	1	0	3	0	3	0	5
Q1125	Q2-09 DO YOU USE OR REFER TO LOGIC SYMBOL OF DELAY LINES	1	0	0	0	3	0	0
Q1126	Q3-01 IN YOUR PRESENT JOB, DO YOU WORK WITH DIGITAL-TO-ANALOG (D/A) CONVERTERS, ANALOG-TO-DIGITAL (A/D)	1	0	3	0	3	0	5
Q1127	Q3-02 DO YOU COMPUTE OUTPUT VOLTAGES FOR ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A) CONVERTERS FOR GIVEN INPUT	1	0	0	0	3	0	0
Q1128	Q3-03 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE COUNT IN ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A)	1	0	0	0	3	0	0

REGISTERS

STORAGE DEVICES

DIGITAL TO
ANALOG CONVERTERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

Task ID	Description	SPC 003	SPC 007	SPC U08	SPC 009	SPC 010	SPC 011	SPC 012
Q1129	DO YOU COMPUTE ANALOG VOLTAGES FOR GIVEN BINARY COUNTS IN ELECTRONIC DIGITAL-TO-ANALOG (D/A) CONVERTERS	1	0	0	0	3	0	0
Q1130	DO YOU PERFORM SAMPLE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	1	0	0	0	3	0	0
Q1131	DO YOU PERFORM HOLD FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	1	0	0	0	3	0	0
Q1132	DO YOU PERFORM COMPARE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	1	0	0	0	3	0	0
Q1133	DO YOU PERFORM DIGITIZE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	1	0	0	0	3	0	0
Q1134	DO YOU PERFORM DON'T REMEMBER WHICH FUNCTION TASKS OR VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER	1	0	0	2	3	0	0
Q1135	DO YOU USE OR REFER TO SAMPLE FUNCTION OF A/D CONVERTERS	1	0	0	0	3	0	0
Q1136	DO YOU USE OR REFER TO HOLD FUNCTION OF A/D CONVERTERS	1	0	0	0	3	0	0
Q1137	DO YOU USE OR REFER TO COMPARE FUNCTION OF A/D CONVERTERS	1	0	0	0	3	0	0
Q1138	DO YOU USE OR REFER TO DIGITAL FUNCTION OF A/D CONVERTERS	1	0	0	0	3	0	0
Q1139	DO YOU PERFORM ANY TASKS ON MECHANICAL ANALOG-TO-DIGITAL (A/D) CONVERTERS	1	0	0	0	3	0	0
R1140	DO YOU WORK WITH PHANTASTRON CIRCUITRY IN YOUR PRESENT JOB	1	0	0	0	3	0	0
R1141	DO YOU WORK WITH SCHMITT TRIGGER CIRCUITS	5	4	6	9	3	0	5
R1142	DO YOU TRACE DATA FLOW THROUGH SCHMITT TRIGGER SCHEMATIC DIAGRAMS	3	3	3	7	3	0	5
R1143	DO YOU USE OR REFER TO SCHMITT TRIGGER LOGIC SYMBOLS	3	2	6	5	3	0	5
R1144	DO YOU FABRICATE MULTICONDUCTOR CABLES	8	6	14	4	5	3	10
R1145	DO YOU FABRICATE COAXIAL CABLES	4	3	8	2	5	0	5
S1146	DO YOU PERFORM ANY TASKS ON VISUAL READOUT SYSTEMS	10	8	14	7	8	6	14
S1147	DO YOU PERFORM ANY TASKS ON NIXIE LIGHTS OR NIXIE LIGHT DECODER SYSTEMS	2	1	3	0	5	0	5
S1148	DO YOU ANALYZE NIXIE LIGHT DECODER SYSTEMS USING BOOLEAN ALGEBRA	2	1	3	0	5	0	5
S1149	DO YOU WORK WITH PHOTO TUBES IN YOUR PRESENT JOB	55	55	61	68	35	42	57
S1150	DO YOU WORK WITH CHOPPER CIRCUITS	6	5	8	9	5	0	5
S1151	DO YOU MEASURE EXCITATION FREQUENCIES	1	1	0	0	5	0	0
S1152	DO YOU MEASURE VOLTAGE-CURRENT PHASE RELATIONSHIPS	3	2	6	4	5	0	5
S1153	DO YOU USE OR REFER TO EXCITATION FREQUENCIES	2	1	3	0	5	0	5
S1154	DO YOU USE OR REFER TO VOLTAGE-CURRENT PHASE RELATIONSHIPS	4	3	6	5	5	0	5
S1155	DO YOU USE SERVOS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	4	2	8	4	5	0	10

PHANTASTRONS
SCHMITT TRIGGERS
CABLE FABRICATION
INPUT/OUTPUT DEVICES
PHOTO SENSITIVE DEVICES
SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

SPC SPC SPC SPC SPC SPC SPC SPC SPC SPC
003 007 008 009 010 011 012

0Y-TSK

ITEM	DESCRIPTION	3	2	3	4	5	0	5	0	5	0	5
51156	53-07 DO YOU USE DETECTORS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	3	2	3	4	5	0	5	0	5	0	5
51157	53-08 DO YOU USE ERROR SIGNAL DEVICES IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	2	1	6	0	5	0	5	0	5	0	5
51158	53-09 DO YOU USE COMPARISON CIRCUITS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	2	2	3	2	5	0	5	0	5	0	5
11159	11-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH INFRARED SYSTEMS	2	2	3	2	5	0	5	0	5	0	5
11160	11-02 DO YOU INSPECT INFRARED SYSTEMS	1	1	0	0	5	0	0	0	0	0	0
11161	11-03 DO YOU CLEAN INFRARED SYSTEMS	1	1	0	0	5	0	0	0	0	0	0
11162	11-04 DO YOU ADJUST OR CALIBRATE INFRARED SYSTEMS	1	1	0	0	5	0	0	0	0	0	0
11163	11-05 DO YOU OPERATE INFRARED SYSTEMS	2	2	3	2	5	0	5	0	5	0	5
11164	11-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF INFRARED SYSTEMS	1	1	0	0	5	0	0	0	0	0	0
11165	11-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF INFRARED SYSTEMS	1	1	0	0	5	0	0	0	0	0	0
11166	11-08 DO YOU TROUBLESHOOT DOWN TO INFRARED SYSTEM COMPONENT PARTS	1	1	0	0	5	0	0	0	0	0	0
11167	11-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF INFRARED SYSTEMS	1	0	0	0	3	0	0	0	0	0	0
11168	11-10 DO YOU REMOVE OR REPLACE INFRARED SYSTEM COMPONENT PARTS	1	0	0	0	3	0	0	0	0	0	0
11169	11-11 DO YOU USE OR REFER TO FAR REGION	1	1	0	2	3	0	0	0	0	0	0
11170	11-12 DO YOU USE OR REFER TO INTERMEDIATE REGION	1	1	0	2	3	0	0	0	0	0	0
11171	11-13 DO YOU USE OR REFER TO NEAR REGION	1	1	0	2	3	0	0	0	0	0	0
11172	11-14 DO YOU USE OR REFER TO MICRON	1	0	0	0	3	0	0	0	0	0	0
11173	11-15 DO YOU USE OR REFER TO GRAY BODIES	1	0	0	0	3	0	0	0	0	0	0
11174	11-16 DO YOU USE OR REFER TO BLACK BODIES	1	0	0	0	3	0	0	0	0	0	0
11175	11-17 DO YOU USE OR REFER TO ABSORPTION	1	0	0	0	3	0	0	0	0	0	0
11176	11-18 DO YOU USE OR REFER TO SCATTERING	1	0	0	0	3	0	0	0	0	0	0
11177	11-19 DO YOU USE OR REFER TO ABSOLUTE ZERO	1	0	0	0	3	0	0	0	0	0	0
11178	11-20 DO YOU PERFORM TASKS ON BLITZ	1	0	0	0	3	0	0	0	0	0	0
11179	11-21 DO YOU PERFORM TASKS ON TARGET BUTTONS	1	0	0	0	3	0	0	0	0	0	0
11180	11-22 DO YOU PERFORM TASKS ON ERECTOK LENSES	1	0	0	0	3	0	0	0	0	0	0
11181	11-23 DO YOU PERFORM TASKS ON OCULAR LENSES	1	0	3	0	3	0	3	0	3	0	5
11182	11-24 DO YOU PERFORM TASKS ON CORRECTION LENSES	1	0	3	0	3	0	3	0	3	0	5
11183	11-25 DO YOU PERFORM TASKS ON FILMS	1	0	3	0	3	0	3	0	3	0	5
11184	11-26 DO YOU PERFORM TASKS ON SPHERICAL MIRRORS	1	0	3	0	3	0	3	0	3	0	5
11185	11-27 DO YOU PERFORM TASKS ON PLANE MIRRORS	1	0	3	0	3	0	3	0	3	0	5
11186	12-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH LASERS	2	1	3	0	5	0	5	0	5	0	5
11187	12-02 DO YOU INSPECT LASER SYSTEMS	2	0	6	0	3	0	3	0	3	0	10
11188	12-03 DO YOU CLEAN LASER SYSTEMS	2	0	6	0	3	0	3	0	3	0	10
11189	12-04 DO YOU OPERATE LASER SYSTEMS	2	0	6	0	3	0	3	0	3	0	10
11190	12-05 DO YOU OPERATE LASER SYSTEMS	2	0	6	0	3	0	3	0	3	0	10
11191	12-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF LASER SYSTEMS	2	0	6	0	3	0	3	0	3	0	10

LASERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC 003	SPC 007	SPC U08	SPC 009	SPC 010	SPC 011	SPC 012
T1192 T2-07 00 YOU TROUBLESHOOT MAJOR ASSEMBLIES OF LASER SYSTEMS	2	0	6	0	3	0	10
T1193 T2-08 00 YOU TROUBLESHOOT TO COMPONENT PARTS OF LASER SYSTEMS	1	0	3	0	3	0	5
T1194 T2-09 00 YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF LASER SYSTEMS	2	0	6	0	3	0	10
T1195 T2-10 00 YOU REMOVE OR REPLACE COMPONENT PARTS OF LASER SYSTEMS	1	0	3	0	3	0	5
T1196 T2-11 00 YOU USE OR REFER TO ANGSTROMS (A)	2	0	6	0	3	0	10
T1197 T2-12 00 YOU USE OR REFER TO ELECTRON ENERGY LEVELS	1	0	3	0	3	0	5
T1198 T2-13 00 YOU USE OR REFER TO GROUND STATE	1	0	3	0	3	0	5
T1199 T2-14 00 YOU USE OR REFER TO EXCITED STATE	1	0	3	0	3	0	5
T1200 T2-15 00 YOU USE OR REFER TO PACKET OF RADIATION	1	0	3	0	3	0	5
T1201 T2-16 00 YOU USE OR REFER TO PHOTONS	1	0	3	0	3	0	5
T1202 T2-17 00 YOU USE OR REFER TO SPONTANEOUS EMISSION	1	0	3	0	3	0	5
T1203 T2-18 00 YOU USE OR REFER TO STIMULATED EMISSION	1	0	3	0	3	0	5
T1204 T2-19 00 YOU USE OR REFER TO COHERENCE OR INCORHERENCE	2	0	6	0	3	0	10
T1205 T2-20 00 YOU USE OR REFER TO INVERSION LEVEL	1	0	3	0	3	0	5
T1206 T2-21 00 YOU USE OR REFER TO MONOCHROMATIC	2	0	6	0	3	0	14
T1207 T2-22 00 YOU WORK WITH ACTIVE MATERIALS	2	0	6	0	3	0	10
T1208 T2-23 00 YOU WORK WITH PUMPING SOURCES	2	0	6	0	3	0	10
T1209 T2-24 00 YOU WORK WITH FULL SILVERED (100% REFLECTIVE) MIRRORS	1	0	3	0	3	0	5
T1210 T2-25 00 YOU WORK WITH HALF SILVERED (92% REFLECTIVE) MIRRORS	2	0	6	0	3	0	10
T1211 T2-26 00 YOU WORK WITH HELICAL FLASHTUBES	1	0	3	0	3	0	5
T1212 T2-27 00 YOU WORK WITH RUBY	1	0	0	0	3	0	0
T1213 T2-28 00 YOU WORK WITH HELIUM-NEON	1	0	3	0	3	0	5
T1214 T2-29 00 YOU WORK WITH HELIUM-XENON	1	0	0	0	3	0	0
T1215 T2-30 00 YOU WORK WITH XENON	1	0	3	0	3	0	5
T1216 T2-31 00 YOU WORK WITH CESIUM-HELIUM	1	0	0	0	3	0	0
T1217 T2-32 00 YOU WORK WITH ARGON	1	0	3	0	3	0	5
T1218 T2-33 00 YOU WORK WITH NEODYMIUM IN GLASS	1	0	3	0	3	0	5
T1219 T2-34 00 YOU WORK WITH GALLIUM ARSENIDE	1	0	0	0	3	0	0
T1220 T3-01 00 IN YOUR PRESENT JOB DO YOU WORK WITH DISPLAY TUBES, SUCH AS DIRECT VIEW STORAGE (DVST) OR MULTIPLE MODE	1	0	3	0	3	0	5
T1221 T3-02 00 YOU INSPECT DVST OR MMST	1	0	3	0	3	0	5
T1222 T3-03 00 YOU CLEAN DVST OR MMST	1	0	0	0	3	0	0
T1223 T3-04 00 YOU ADJUST OR CALIBRATE DVST OR MMST	1	0	0	0	3	0	0
T1224 T3-05 00 YOU OPERATE SYSTEMS THAT CONTAIN DVST OR MMST	1	0	3	0	3	0	5
T1225 T3-06 00 YOU TROUBLESHOOT DVST OR MMST CIRCUITS	1	0	0	0	3	0	0
T1226 T3-07 00 YOU REMOVE OR REPLACE DVST OR MMST TUBES FROM MAJOR ASSEMBLIES OR UNITS	1	0	3	0	3	0	5
T1227 T3-08 00 YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF DVST	1	0	0	0	3	0	0

DISPLAY TUBES

