Model Curriculum

Building Automation Specialist

Sector:	**Instrumentation Automation Surveillance & Communication**
Sub-Sector:	**Automation**
Occupation:	**Product Engineering / System Design**
Ref ID:	**IAS/Q3006**

List of NOS involved:

1. IAS/N2100 Design, Install and Provide Technical Support for HVAC System
2. IAS/N2101 Design, Install and Provide Technical Support for Fire Alarm Systems
3. IAS/N2102 Install and Provide Technical Support for Access Controls Systems
4. IAS/N2103 Install and Provide Technical Support for CCTV Surveillance Systems
5. IAS/N2104 Integrating and Controlling Building automation Systems
6. IAS/N2105 Work Effectively With Teams
7. IAS/N2003 Health and Safety in Workplace

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Building Automation Specialist

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Building Automation Specialist", in the "INSTRUMENTATION AUTOMATION SURVEILLANCE & COMMUNICATION" Sector/Industry and aims at building the following key competencies amongst the learner:

Program Name	**Building Automation Specialist**		
Qualification Pack Name & Reference ID.	IAS/Q3006, V 1.0		
Version No.	1.0	**Version Update Date**	30/07/2019
Pre-requisites to Training	Diploma in Mechanical/Civil/Industrial/Instrumentation/Electrical/ Mechatronics/ Electronics Engineering		
Training Outcomes	**After completing this programme, participants will be able to:** • Capture client requirements of building automation needs • Study existing facilities, if any, at the client premises and suggest appropriate technologies and systems • Perform system design - to clearly identify sub systems required for the project, such as HVAC (Heating, Ventilation and Air Conditioning) system, Fire detection and Alarm system (FAS), Access Control System, CCTV Surveillance system and other associated communication, power and cabling system. • Create specifications, drawings and Bill of Quantities (BOQ)of the system to aid in procurement • Create wiring specifications, wiring layout and wiring plan. • Inspect the correctness of the procured systems against specifications. • Install components of HVAC system and verify correct operation. • Install components of FAS system and verify correct operation. • Install components of Access Control System and verify correct operation. • Install components of CCTV system and verify correct operation. • Integrate HVAC, FAS, Access Control and CCTV systems on Building Automation System Control Panel and verify correct operation. • Follow health and safety norms of the industry • Work effectively in a multidisciplinary team		

This course encompasses 7 out of 7 National Occupational Standards (NOS) of "Building Automation Specialist
" Qualification Pack issued by "Instrumentation Automation Surveillance & Communication Sector Skill Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Introduction to Building Automation System and Basic Electricals and Electronics** **Theory Duration** (hh:mm) 12:00 **Practical Duration** (hh:mm) 16:00 **Facility Visit Duration** (hh:mm) 05:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Familiarize with the components and technologies involved in a typical Building Automation System • Recall concepts of Current, Voltage, Power Factor & Power, Ohms Law, Kirchhoff's laws • Recall of concepts of AC & DC Current and Voltage, Line & Neutral, Single and Three phase systems • Recall of basic electronic components - Diodes, Triodes, Transistors, Resistors, Capacitors, Inductors, LEDs, Thermistors etc. • Recall of basic electrical components Push Buttons, Indicating Lamps, Selector/Key Switches, Limit Switches, and Proximity Switches etc. • Recall of Transformers (CT/PT), Voltmeter, Ammeter, Energy meter, Terminal Blocks & Din Rails • Recall of concept of Relays and Contactors (NO/NC) • Recall of Power Supplies, Earthing & Grounding practices • Recall of the properties and use of Shielded & Unshielded Cables, Cable Gauges & AWG sizes, IS standards for Colour Codes & Application • Recall of Electrical Circuits (Series / Parallel), Star & Delta Connections, Bus Bars, Line chokes & Capacitors, ISA Symbols	Laptop, white board, marker, projector, Electrical & Electronics lab Facility visit

Sr. No.	Module	Key Learning Outcomes	Equipment Required
2	**Basics of HVAC** **Theory Duration** (hh:mm) 16:00 **Practical Duration** (hh:mm) 24:00 **Facility Visit Duration** (hh:mm) 05:00 **Corresponding NOS Code** IAS/N2100	Acquire Understanding of: • Refrigeration Cycle • Components of an A/C system • Fixed Air Volume & Variable Air Volume Applications • Psychometric Able to perform: • Capture the requirements of HVAC Systems by site survey • Suggest and taking approval from the customer for HVAC Systems • Install approved HVAC components as per site requirements • Wire Electrical and Electronics components as per the requirements • Test of HVAC systems • Provide Technical Support for HVAC Systems	Laptop, white board, marker, projector, Facility visit
3	**Fire Alarm system** **Theory Duration** (hh:mm) 08:00 **Practical Duration** (hh:mm) 16:00 **Facility Visit Duration** (hh:mm) 04:00 **Corresponding NOS Code** IAS/N2101	Acquire understanding of: 1. Fire Lifecycle 2. Detection Technologies 3. Fire Panel Technologies 4. Input / Output Devices 5. Detector & Device Wiring Schema 6. Fireman's Telephony & Talkback system 7. NFPA 72 Guidelines 8. Fire Safety Strategies Able to perform: • Capture the requirements of Fire Alarm Systems by site survey • Suggest and taking approval from the customer for Fire Alarm Systems • Install approved Fire Alarm components as per site requirements • Wire Electrical and Electronics components as per the requirements • Test of new systems at customer site • Provide Technical Support for Fire Alarm Systems at the site	Laptop, white board, marker, projector, first aid, FAS and sensors, Fire safety gadgets and accessories, Software
4	**Access Control Systems** **Theory Duration** (hh:mm) 08:00	Acquire Understanding of: 1. Access Control systems 2. Access Control Technologies 3. Data Encryption & Security 4. Access Control Strategy	Laptop, white board, marker, projector, Facility visit

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Practical Duration (hh:mm) 16:00 **Facility Visit Duration** (hh:mm) 04:00 **Corresponding NOS Code** IAS/N2102	5. Access Controllers 6. Biometrics 7. Barriers 8. Reporting & Operations Able to perform: • Capture the requirements of Access Controls Systems by site survey • Suggest and taking approval from the customer for Access Controls System • Install approved Access Controls components as per site requirements • Wire Electrical and Electronics components as per specifications • Test Access Control systems at customer premises • Provide Technical Support for Access Controls Systems • Achieve Quality and Productivity as per company norms	
5	**CCTV Surveillance** **Theory Duration** (hh:mm) 08:00 **Practical Duration** (hh:mm) 16:00 **Facility Visit Duration** (hh:mm) 04:00 **Corresponding NOS Code** IAS/N2103	Acquire understanding of: 1. Optics in Cameras 2. Types of Camera Technologies 3. Types of Cameras 4. Video Analytics 5. Integration Able to perform: • Capture the requirements of CCTV Surveillance Systems by site survey • Suggest and taking approval from the customer for CCTV System to be installed • Install approved CCTV components as per site requirements • Wire Electrical and Electronics components as per specifications • Test CCTV Components at customer premises • Provide Technical Support for CCTV • Systems • Achieve Quality and Productivity as per company norms	Laptop, white board, marker, projector, CCTV System, Software
6	**Basic BAS & HMI Components**	• Understanding Components of a Building Automation system	Laptop, white board, marker, projector,

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Theory Duration (hh:mm) 28:00 **Practical Duration** (hh:mm) 64:00 **Facility Visit Duration** (hh:mm) 08:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Understanding Types of I/Os (Analog, Digital, HS Pulse) • Managing DDC Instructions & Programming • Understanding DDC Networking & Architecture • Understanding Peer-to-peer & Daisy Chain Networks • Understanding Ethernet I/P & Industrial Networks • Uploading & Downloading Programs • Creating BMS Graphics Screen & Tags • Wiring for I/Os, Source and Sink Connections • Testing of I/O Terminations (Point Testing)	Ethernet LAN, HMI, Devices, Sensors, Cables, Tools, Meters, Software
7	**Integrating and controlling Building Automation Systems** **Theory Duration** (hh:mm) 16:00 **Practical Duration** (hh:mm) 24:00 **Facility Visit Duration** (hh:mm) 08:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	Able to perform: • Integrate HVAC Components • Integrate Fire Alarm Systems • Integrate Access Control Devices • Integrate CCTV Surveillance Systems • Control and Supervise Building Automation Systems using Control Panel • Train the client representative on use of Control Panel	Laptop, white board, marker, projector, Devices, Sensors, Cables, Tools, Meters, Software for FAS, ACS, CCTV, HMI
8	**Wiring Drawings of Control Panels** **Theory Duration** (hh:mm) 08:00 **Practical Duration** (hh:mm) 16:00	• Understand Basic AutoCAD Commands • Reading AutoCAD drawings of Wiring • Able to edit and create AutoCAD drawings of panel wiring	Laptop, white board, marker, projector, AutoCAD

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104		
9	**Electrical Safety** **Theory Duration** (hh:mm) 04:00 **Practical Duration** (hh:mm) 08:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Understanding and Use of Rubber soled Shoes, Gloves and Goggles • Understand and apply : 1. Conductivity of Water 2. MCBs, ELCBs, Fuses, SFUs 3. Earthing Pit design and build 4. Assemble Earthing Plates & Strips	Laptop, white board, marker, projector, Electrical safety accessories, Electrical switchgear, Conductivity meter, Earth pit and its components
10	**Tools & Equipment** **Theory Duration** (hh:mm) 02:00 **Practical Duration** (hh:mm) 06:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Using a Multi-meter for Current, voltage (AC/DC), Resistance & Continuity measurements • Using a tester • Using a Tong-Tester • Using Pliers and Wire Stripper • Screw Driver Set (All terminal types) • Use of Allen Key Set • Using a Power Drill (Drill bits) • Using Insulation Tape • Using Wire Lugs • Using a soldering Iron • Using a Megger • Using Wrenches, Hammer, Wire bender etc. • Using a Ladder • Using Shielded cable tools • Using LAN cable tools	Laptop, white board, marker, projector, Tool sets, Meter sets, Wires, Cables, Terminals, Sockets, Supporting infrastructure
11	**Maintaining a Control Panel** **Theory Duration**	• Testing for Shorts / Continuity • Cutting required lengths • Using Ferrules & Cable lugs • Terminal Tightening Torque	Laptop, white board, marker, projector, Tool sets, Meter sets,

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 04:00 **Practical Duration** (hh:mm) 08:00 **Facility Visit Duration** (hh:mm) 04:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Checking the circuits • Dressing the Cables • Managing Cable Glands (Single Compression /Double Compression)	Wires, Cables, Terminals, Sockets, Panels, Cable tray, Ferrules, Cable Glands, Supporting infrastructure
12	**Identifying Faulty Components** **Theory Duration** (hh:mm) 08:00 **Practical Duration** (hh:mm) 12:00 **Facility Visit Duration** (hh:mm) 04:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Testing Power Supply • Testing CT/PT • Testing Relays & Contactors • Testing Instrumentation (Temperature / RH Sensors, Flow meters, Actuators etc.) • Testing Pushbuttons, Indicating Lamps & Selector Switches etc.	Laptop, white board, marker, projector, Tool sets, Meter sets, Wires, Cables, Terminals, Sockets, Supporting infrastructure
13	**Fundamentals of Motors, Generators & Starters** **Theory Duration** (hh:mm) 06:00 **Practical Duration** (hh:mm) 12:00 **Facility Visit Duration**	Acquire understanding of: 1. Motors and Generators 2. Slip ring Induction Motor 3. Squirrel Cage Induction Motor 4. DOL Starter & Star / Delta Starter	Laptop, white board, marker, projector, Motors, Generators, Starters, Tool sets, Meter sets, Wires, Cables, Terminals, Sockets, Supporting infrastructure

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 02:00 **Corresponding NOS Code** IAS/N2100		
14	**Basics of AC Drives** **Theory Duration** (hh:mm) 06:00 **Practical Duration** (hh:mm) 12:00 **Facility Visit Duration** (hh:mm) 02:00 **Corresponding NOS Code** IAS/N2100	Acquire understanding : 1. Components of a AC Drive system 2. Types of VFD Control Terminals 3. Wiring for I/Os	Laptop, white board, marker, projector, Motor, Tool sets, Meter sets, Wires, Cables, Terminals, Sockets, Supporting infrastructure
15	**Professional Skills** **Theory Duration** (hh:mm) 08:00 **Practical Duration** (hh:mm) 08:00 **Corresponding NOS Code** IAS/N2100 IAS/N2101 IAS/N2102 IAS/N2103 IAS/N2104	• Understanding application Requirements • Generating I/O Summary & BOQ • Preparing RFQs • Preparing & Reading Job sheets • Preparing indents, invoices and Maintenance logs • Using MS Excel & MS Word or equivalent software for Record keeping • Preparing As-built documentation, Ferrule list • Sharing and delegation of Tasks • Preparing Task Reports	Laptop, white board, marker, projector, MS Office / Open office software, eMail, Printer
16	**Work Effectively With Teams** **Theory Duration** (hh:mm) 08:00 **Practical Duration** (hh:mm) 08:00	Able to understand and practice: • Creating team environment • Communicating - giving and receiving • Working cooperatively • Participating in team decision making • Demonstrating Sense of Responsibility	Laptop, white board, marker, projector, MS Office / Open office software, email, Printer

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Facility Visit Duration (hh:mm) 00:00 **Corresponding NOS Code** IAS/N2105	• Showing respect for opinions, customs and preferences	
17	**Health and Safety in Workplace** **Theory Duration** (hh:mm) 04:00 **Practical Duration** (hh:mm) 08:00 **Facility Visit Duration** (hh:mm) 02:00 **Corresponding NOS Code** IAS/N2003	• Understanding Safety Policy • Fire & Hazardous chemicals handling • Incident Reporting • Using Fire Extinguishers A,B,C, ABC • ESD Procedures for handling electronic components • Use of Safety Helmets, Ear plugs, Shoes, Gloves, goggles & Safety harnesses. • Using First aid for Electrical Shock & Burn victims • Perform Fire Drills & Evacuation procedures • Use of helmet & Respect for Traffic rules • Understanding Health Policy • Understanding Posture, exercise & diet	Laptop, white board, marker, projector, Fire Drill accessories, First Aid kit, Protective Gear, ESD accessories

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Total Duration **Theory Duration 154:00** **Practical Duration 274:00** **Facility Visit Duration 52:00**	**Unique Equipment Required:** • Laptop, white board, marker, projector, Basic AC & DC Electrical & Electronics lab. • Motors, Generators, Starters, Tool sets, Meter sets, Wires, Cables, Terminals, Sockets. • Access Control System components and accessories, and ACS Software • CCTV System, Software • Ethernet LAN, HMI, Devices, Sensors, Cables, Tools, Meters • Electrical safety accessories, Electrical switchgear, Conductivity meter, Earth pit and its components • Tool sets, Meter sets, Wires, Cables, Terminals, Sockets, Panels, Cable tray, Ferrules, Cable Glands, Supporting infrastructure • Meter sets, Wires, Cables, Terminals, Sockets, Supporting infrastructure • VFD Panel, • Fire Drill accessories, First Aid kit, Protective Gear, ESD accessories • AUTOCAD Software, MS Office / Open office software, eMail, Printer	

Grand Total Course Duration: 480 Hours, 00 Minutes

Trainer Prerequisites for Job role: "Building Automation Specialist" mapped to Qualification Pack: "IAS/Q3006"

Sr. No.	Area	Details
1	**Description**	Building Automation Specialist, also known as Project Engineer, are responsible for the system design, installation and technical support for building automation systems involving microcontroller based systems, such as Fire Detection & Alarm System (FAS), Access Control Systems, Biometrics (ACS) & CCTV Surveillance Systems along with a variety of sensors and actuators. The individual is responsible for understanding client requirements, suggesting appropriate systems and technologies, system design, wiring, integration, testing, installation and maintenance of automation systems used in modern buildings. The individual provides technical supports of the sub systems post installation.
2	**Personal Attributes**	This job requires interdisciplinary aptitude, ability to learn, ability to deal with a variety of technology and people of different trades and skills.
3	**Minimum Educational Qualifications**	Diploma in Mechanical/Civil/Industrial/Instrumentation/Electrical/ Mechatronics/ Electronics
4a	**Domain Certification**	Certified for Job Role: "Building Automation Specialist" mapped to QP: "IAS/Q3006". Minimum accepted score is 80%
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score is 70%.
5	**Experience**	For candidates with Diploma qualification, relevant experience of 3 Years. For candidates with B.Tech. qualification, relevant experience of 1 Year

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	**Building Automation Specialist**
Qualification Pack	**IAS/Q3006**
Sector Skill Council	**INSTRUMENTATION AUTOMATION SURVEILLANCE & COMMUNICATION**

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be approved by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC

2. The assessment for the theory part will be based on knowledge bank of questions approved by the SSC

3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria

5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

Sl. No.	NOS no.	NOS Name	% Weightage
1	IAS/N2100	Design, Install and Provide Technical Support for HVAC System	20
2	IAS/N2101	Design, Install and Provide Technical Support for Fire Alarm Systems	20
3	IAS/N2102	Install and Provide Technical Support for Access Controls Systems	20
4	IAS/N2103	Install and Provide Technical Support for CCTV Surveillance Systems	20
5	IAS/N2104	Integrating and Controlling Building automation Systems	10
6	IAS/N2105	Work Effectively With Teams	5
7	IAS/N2003	Health and Safety in Workplace	5
			100%

				Marks Allocation	
Assessment outcomes	**Assessment Criteria for outcomes**	**Total Marks (130+125+150+150+125+75+50)**	**OUT OF**	**Theory**	**Skills Practical**
1. IAS/N2100 Design, Install and Provide Technical Support for HVAC System	PC1. Capturing work requirements of the client by site survey	**130**	5	2	3
	PC2. Developing BOQ according to the requirement of the client PC3. Able to create 2D models using BAS Software		6	3	3
	PC4. Developing program on BAS Tools for HVAC		5	3	2
	PC5. Developing program on BAS Tools based on Logic gates		5	3	2
	PC6. Developing program related to Air Conditioning on BAS Tools		5	3	2
	PC7. Managing wiring of components in AC Drives and Soft Starters		5	2	3
	PC8. Suggesting appropriate HVAC components to the customer according to the site		4	2	2
	PC9. Assist the customer in choosing different types of technologies and specifications used in HVAC Systems		4	2	2
	PC10. Taking approval from the customer		4	2	2
	PC11. Maintaining complete documentation of the components to be installed		5	2	3
	PC12. Collecting and checking of components at customer premises as per checklist		5	2	3
	PC13. Installing HVAC components including VFD at site as per the requirement		5	2	3
	PC14. Installing AHU (Air Handling Unit)		4	1	3
	PC15. Installing Chiller		4	1	3
	PC16. Installing Sensors		4	1	3
	PC17. Installing VAV (Variable Air Volume), TFA (Treated Fresh Air) etc.		4	2	2
	PC18. Wiring Power Supplies, Earthing & Grounding		4	2	2
	PC19. Wiring and connecting Shielded & Unshielded Cables, Cable Gauges & AWG sizes		5	2	3
	PC20. Wiring of HVAC hardware PC		4	2	2
	PC21. Testing of installed HVAC System		5	2	3
	PC22. Ensure proper working of the installed HVAC System		5	2	3

	PC23. Assuring 100% satisfaction from the customer after installation		4	2	2
	PC24. Troubleshoot the errors if the system is not working as per the requirements		4	1	3
	PC25. Calculating total number of HVAC controllers as per I/O summary		3	1	2
	PC26. Managing refrigeration process needed for the site by BAS controller		4	1	3
	PC27. Managing Wiring and drawings of Components used in Centralized Air-Conditioning		4	1	3
	PC28. Providing Technical Support for HVAC functions using BAS controller		4	1	3
	PC29. Calculating Heat Load		5	3	2
		Total	**130**	**55**	**75**
2. IAS/N2101 Design, Install and Provide Technical Support for Fire Alarm Systems	PC1. Capturing work requirements of the client by site survey	**125**	3	1	2
	PC2. Developing BOQ according to the requirement of the client		4	2	2
	PC3. Assist customer about different types of technologies used in FAS according to the need of site		4	2	2
	PC4. Ensuring that Suggesting components matches to customers requirement		4	2	2
	PC5. Assist the customers about the company policies towards services and warranty		4	2	2
	PC6. Managing proper documentation of site survey and customers' requirements		3	1	2
	PC7. Suggesting appropriate FAS components to the customer according to the site		3	1	2
	PC8. Assist the customers about Fire Alarm systems with their specifications		4	1	3
	PC9. Taking approval for installing FAS components from the customer		3	1	2
	PC10. Preparing and assembling FAS components as per the requirement		2	1	1
	PC11. Creating check list before going to the site for installation				0
	PC12. Maintaining complete documentation of the components to be installed		4	2	2
	PC13. Collecting and checking of components before moving to customer premises		4	2	2
	PC14. Assist technicians for checking hardware components before FAS Installation		3	1	2
	PC15. Replace FAS components if found malfunctioning		4	2	2
	PC16. Prepare Checklist and ensure the availability of every component before installation		3	1	2
	PC17. Installing FAS components at the customers site		4	2	2

	PC18. Installing fire Detection components as per site requirement		4	2	2
	PC19. Installing Heat/RoR Detectors, Smoke Detectors and Multi Criteria detectors as per requirement		4	1	3
	PC20. Wiring Power Supplies, Earthing & Grounding		3	1	2
	PC21. Wiring and connecting Shielded & Unshielded Cables, Cable Gauges & AWG sizes		4	2	2
	PC22. Ensure adequate length of connecting cables as per the requirements		3	1	2
	PC23. Wiring of FAS hardware's		4	1	3
	PC24. Use proper terminals as prescribed for joining cables		3	1	2
	PC25. Use power cable for connecting power supply with proper rating		4	2	2
	PC26. Testing installed FAS components at customer premises		3	2	1
	PC27. Ensure proper working of every component		4	1	3
	PC28. Ensure proper working of FAS systems before leaving the site and explaining the customer how to operate the system properly		4	2	2
	PC29. Assuring 100% satisfaction from the customer after installation		4	1	3
	PC30. Troubleshoot the errors if the system is not working as per the requirements		6	2	4
	PC31. Providing Technical Support for Fire Detection & Alarm System as per Fire Life cycle and Class of Fire		4	2	2
	PC32. Providing Technical Support for intelligent Fire Panels & conventional Fire Panels installed		4	2	2
	PC33. Managing Detector & Device Wiring Schema		4	2	2
	PC34. Integrating Fireman's Telephony & Talkback system with fire alarm		4	2	2
	PC35. Selecting Fire Safety Strategies for prevention		3	1	2
		Total	**125**	**52**	**73**
3. IAS/N2102 Install and Providing Technical Support for Access Controls Systems	PC1. Capturing work requirements of the client by site survey	**150**	3	2	1
	PC2. Developing BOQ according to the requirement of the client		4	2	2
	PC3. Assist customer about different types of technologies used in Access Control Systems according to the need of site		3	1	2
	PC4. Ensuring that Suggesting components matches to customers requirement		4	2	2
	PC5. Assist the customers about the company policies towards services and warranty		2	1	1
	PC6. Managing proper documentation of site survey and customers' requirements		2	1	1

	PC7. Suggesting appropriate Access Controls components to the customer according to the site		3	1	2
	PC8. Assist the customers about technologies used in Access Control systems with their specifications		3	1	2
	PC9. Taking approval for installing Access Control Systems from the customer		2	1	1
	PC10. Preparing and assembling Access Control Systems components as per the requirement		2	1	1
	PC11. Creating check list before going to the site for installation		2	1	1
	PC12. Maintaining complete documentation of the components to be installed		3	1	2
	PC13. Collecting and checking of components before moving to customer premises		2	1	1
	PC14. Assist technicians for checking hardware components before Installation		2	1	1
	PC15. Replace components if found malfunctioning		2	1	1
	PC16. Prepare Checklist and ensure the availability of every component before installation		4	1	3
	PC17. Installing components at the customers site		6	2	4
	PC18. Install hardware such as smart hub, RFID Card, Door control unit, card readers etc.		5	2	3
	PC19. Ensure that components are matching with customers requirement and installed as per standard operating operation		4	1	3
	PC20. Determining the type of cable requirement for different types of network type such as USB, twisted pair, etc.		3	1	2
	PC21. Ensure adequate length of cables are available for installation		2	1	1
	PC22. Wiring Power Supplies, Earthing & Grounding.		3	1	2
	PC23. Checking voltage and resistance at all appropriate points of the system		4	1	3
	PC24. Correcting alignment and operation of access point hardware		5	2	3
	PC25. Verifying access levels		6	2	4
	PC26. Checking correct operation of each reader		4	1	3
	PC27. Testing Release time for each lock using software		3	1	2
	PC28. Checking the signals if doors are held open and signaling is required		2	1	1
	PC29. Checking all the data for correct entry in the ACS software		2	1	1
	PC30. Checking alarms to display correctly		4	1	3
	PC31. Defining level of particular object in the software		4	1	3
	PC32. Identifying the operating system and software requirement for the access control system		3	1	2

	PC33. Providing Technical Support for Access controls devices at the customer premises		4	1	3
	PC34. Commissioning Access Controls Systems performance as per customer requirements		3	1	2
	PC35. Achieve zero errors in commissioning as per company policy		3	1	2
	PC36. identify problems and alert on time		3	1	2
	PC37. fix for any errors (if any) identified		3	1	2
	PC38. Verifying software implementation checks;(AI, AO, DI,DO) I/O points		3	1	2
	PC39. Verify sensor calibration, control sequence logic, graphics and alarm code		3	1	2
	PC40. Performing software functionality test		4	2	2
	PC41. Achieve 100% work schedule as planned for the week		3	1	2
	PC42. Meet 100% daily or monthly target		4	2	2
	PC43. Achieve zero component damage		3	1	2
	PC44. Keep work area clean and organized		4	2	2
	PC45. Identify problems and alert in time		4	2	2
	PC46. Achieve 100% compliance with health and safety guidelines and rules		3	1	2
		Total	**150**	**57**	**93**
4. IAS/N2103 Installing and Providing Technical Support for CCTV Surveillance Systems	PC1. Capturing work requirements of the client by site survey	**150**	3	2	1
	PC2. Developing BOQ according to the requirement of the client		3	1	2
	PC3. Assist customer about different types of technologies used in CCTV Surveillance Systems according to the need of site		3	1	2
	PC4. Ensuring that Suggesting components matches to customers requirement		3	1	2
	PC5. Assist the customers about the company policies towards services and warranty		2	1	1
	PC6. Managing proper documentation of site survey and customers' requirements		2	1	1
	PC7. Suggesting appropriate CCTV components to the customer according to the site		3	1	2
	PC8. Assist the customers about technologies used in CCTV systems with their specifications		2	1	1
	PC9. Taking approval for installing CCTV Systems from the customer		2	1	1
	PC10. Preparing and assembling CCTV Systems components as per the requirement		2	1	1
	PC11. Creating check list before going to the site for installation		2	1	1

	PC12. Maintaining complete documentation of the components to be installed		3	1	2
	PC13. Procure the hardware required for CCTV system installation		2	1	1
	PC14. Collecting and checking of components before moving to customer premises		2	1	1
	PC15. Assist technicians for checking hardware components before Installation				0
	PC16. Replace components if found malfunctioning		2	1	1
	PC17. Prepare Checklist and ensure the availability of every component before installation		4	1	3
	PC18. Installing CCTV components at the customers site		5	2	3
	PC19. mount the CCTV camera so as to cover maximum area		3	1	2
	PC20. decide on the height of camera installation according to the end purpose		3	1	2
	PC21. set up the type of camera such as pan, tilt, zoom unit as per customer requirement		3	1	2
	PC22. set camera controls		3	1	2
	PC23. connect the power and video output cable to the camera		2	1	1
	PC24. Ensure that all the hardware matches the customer requirement, agreed features and specifications		2	1	1
	PC25. Determining the type of cable requirement for different types of network type such as USB, twisted pair, etc.		4	1	3
	PC26. Ensure adequate length of cables are available for installation		5	2	3
	PC27. Wiring Power Supplies, Earthing & Grounding.		5	2	3
	PC28. lay the cables in the building or site to connect the camera and system		3	1	2
	PC29. use BNC connectors for joining cables and crimp them		3	1	2
	PC30. use power cable of specified thickness to connect CCTV system with power supply		2	1	1
	PC31. connect all the cables from multiple cameras to the CCTV system area		3	1	2
	PC32. Checking voltage and resistance at all appropriate points of the system		3	1	2
	PC33. Correcting alignment and operation of CCTV hardware		3	1	2
	PC34. Checking correct operation of each component. Ensure that there are no malfunctioning, if yes than replace the component		4	1	3
	PC35. Checking the signals of CCTV components		3	1	2
	PC36. Checking all the data received by CCTV as per the requirement		3	1	2

	PC37. Ensure that there are no cable joins, sharp bends during cabling		3	1	2
	PC38. Ensure 100% satisfaction from customers for all the installed components		3	1	2
	PC39. Providing Technical Support for CCTV devices at the customer premises		3	1	2
	PC40. Commissioning CCTV Systems performance as per customer requirements		3	1	2
	PC41. Achieve zero errors in commissioning as per company policy		3	1	2
	PC42. identify problems and alert on time		3	1	2
	PC43. fix for any errors (if any) identified		3	1	2
	PC44. Verifying software implementation checks;(AI, AO, DI,DO) I/O points		3	1	2
	PC45. ensure zero-material damage while handling the equipment during installation process		3	1	2
	PC46. Performing software functionality test		3	1	2
	PC47. Achieve 100% work schedule as planned for the week		3	1	2
	PC48. follow standard operating procedure of tools and equipment and avoid any hazard		3	1	2
	PC49. achieve zero component damage		3	1	2
	PC50. Keep work area clean and organized		3	1	2
	PC51. achieve 100% compliance with health and safety guidelines and rules		3	1	2
	PC52. Ensure installed components as per company norms and standards		3	1	2
		Total	**150**	**55**	**95**
5. IAS/N2104 Integrating and controlling Building Automation Systems	PC1. Installing and Controlling HVAC Components using DDC Controllers	**125**	4	2	2
	PC2. Graphically monitor, control, alarm and diagnose Building Equipment remotely		4	2	2
	PC3. Creating communication between DDC Controllers using data Bus		3	1	2
	PC4. Using BACnet, LON(Echelon) and MODBUS to communicate on data Bus		4	2	2
	PC5. Integrating installed HVAC Components with other Building Automation Systems using Software and programming on Single Control Panel		4	2	2
	PC6. Integrating different detectors such as Heat, Smoke, Flame Ionization Detectors, Beam Detectors etc. with control panel		3	1	2
	PC7. Using Conventional Systems and analogue addressable systems for fire panels		3	1	2
	PC8. Creating and testing communication between control panel and detectors		3	1	2

	PC9. Using Intelligent addressable systems as per the requirement		2	1	1
	PC10. Integrating Fire Alarm Components with central fire alarm system		2	1	1
	PC11. Integrating Fire alarm system with centralized control panel		3	1	2
	PC12. Interfacing between different networks used in Access Controls systems		3	1	2
	PC13. Integrating tailgate detectors to remove unauthorized access		2	1	1
	PC14. Controlling and monitoring multiple doors using reader controllers		2	1	1
	PC15. Creating communication between control panel and access control servers		3	2	1
	PC16. Integrating DIU (Door interface Units)		4	1	3
	PC17. Integrating access control and intrusion detection		6	2	4
	PC18. Installing Biometric systems on application device		5	2	3
	PC19. Installing and creating communication between magnetic locks and doors		4	1	3
	PC20. Managing Smart card management systems		3	1	2
	PC21. Integrating Access Control System with Time/Attendance payroll system		2	1	1
	PC22. Managing Weigand Communication for specific interface between card and readers.		2	1	1
	PC23. Integrating Access Control devices with BAS control Panel		4	1	3
	PC24. Managing Iris and Auto Iris functionality of installed CCTV System		5	2	3
	PC25. Managing Automatic Shutter Speed		6	2	4
	PC26. Creating communication between CCTV Camera and DVR or NVR		4	1	3
	PC27. Managing Automatic Gain Control		3	1	2
	PC28. Managing Synchronization between installed CCTV Camera		2	1	1
	PC29. Creating communication between IP cameras and network		4	1	3
	PC30. Managing NVR and NVR Software		4	1	3
	PC31. Installing and managing Facial and number plate recognition system		3	1	2
	PC32. Integrating CCTV Surveillance System with Security system to provide centralized management of access control		4	1	3
	PC33. Integrating centralized Access Control System with Building Automation System control Panel		3	1	2
	PC34. Testing of overall integrated Building Automation System through control panel		3	1	2

	PC35. Ensure proper working and controlling of every installed device using control panel		3	1	2
	PC36. Assuring 100% satisfaction from the customer after installation of BAS		3	1	2
	PC37. Troubleshoot the errors if the system is not working as per the requirements		3	1	2
		Total	**125**	**46**	**79**
6. IAS/N2105 Work Effectively With Teams	PC1. Know and understand the team objectives and goals	**75**	3	1	2
	PC2. Know team members by name. Greet them appropriately and respond to their greetings.		2	1	1
	PC3. Know the roles and responsibilities of team members. Ensure others know about you and your role in the team		2	1	1
	PC4. Learn about the culture and preferences of team members – especially if they belong to other organizations or nationalities		5	1	4
	PC5. Follow organization's policies and procedures for working with team members within and outside the organization – especially relating to privacy, confidentiality and security.		2	1	1
	PC6. Create an environment of trust and mutual respect		3	1	2
	PC7. Use appropriate mode of communication – verbal, written, mail, phone or text and clearly articulate your message to ensure that the recipient understands the message.		2	1	1
	PC8. Listen to team members and try to understand what they are wanting to say. Seek or provide clarifications if you see any gap in understanding		3	1	2
	PC9. Communicate professionally and follow organization protocols. Do not overload the team members with unnecessary and unsolicited information		4	1	3
	PC10. Share important information with the team timely.		3	1	2
	PC11. Respond to communications promptly.		3	1	2
	PC12. Perform own role and produce output in time for other team members to consume		3	1	2
	PC13. Receive inputs from others and work upon it per role requirement		2	1	1
	PC14. Make adjustments within the permissible rules so that work flows smoothly.		2	1	1

	PC15. Help team members to perform their role effectively and provide any clarifications and support they need		2	1	1
	PC16. Share tools and common resources fairly, taking cognizance of others' needs and schedules		2	1	1
	PC17. Resolve any contentious issues amicably, involving the team lead or the supervisor if needed		2	1	1
	PC18. Let team members know in good time if you cannot carry out your commitments, explaining the reasons and alternate solutions, if any. Let the team lead know about this.		2	1	1
	PC19. Think positively and make constructive suggestions to meet the goals		2	1	1
	PC20. Accept and give suggestions with open mind		2	1	1
	PC21. Take initiatives and volunteer to contribute		2	1	1
	PC22. Help team members with facts and figures to arrive at workable decisions		2	1	1
	PC23. Accept decisions professionally and support these, even if these do not match your suggestions and personal views		4	1	3
	PC24. Act in the interest of the team and the organization to ensure that things do not 'fall through the gap' and team goals are achieved.		4	1	3
	PC25. Take initiative to correct the situation if something seems to be going wrong.		2	1	1
	PC26. Seek help or escalate if the situation demands		2	1	1
	PC27. Follow organization's and statutory guidelines about making references or comments to social customs or preferences		2	1	1
	PC28. Refrain from making any comments to hurt sentiments		2	1	1
	PC29. Accommodate team members' preferences to the extent feasible. If these come in the way of fulfilling team goals, discuss with the supervisor/ team leader.		2	1	1
	PC30. Seek information and clarifications from others if you do not understand any customs.		2	1	1
		Total	**75**	**30**	**45**
7. IAS/N2003 Health and Safety in Workplace	PC1. comply with general safety procedures followed in the company	**50**	3	2	1
	PC2. follow standard safety procedures while handling an equipment, hazardous material or tool		2	1	1

	PC3. remove rings or any other metal objects before working on the unit		4	2	2
	PC4. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.		4	1	3
	PC5. escalate about any hazardous materials or things found in the premises		4	1	3
	PC6. report about any breach of safety procedure in the company		3	1	2
	PC7. ensure zero accidents at work		5	2	3
	PC8. avoid damage of components due to negligence in ESD procedures		4	1	3
	PC9. regularly participate in fire drills or other safety related workshops organized by the company		5	2	3
	PC10. ensure no loss for company due to safety negligence		4	1	3
	PC11. maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials		4	2	2
	PC12. participate in company organized health sessions such as yoga, physiotherapy or games		4	2	2
	PC13. handle heavy and hazardous materials with care and using appropriate tools and handling equipment such as trolleys, jacks and ladders		4	2	2
		Total	**50**	**20**	**30**