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REFERENCE SYLLABUS

For

International Power Engineer (5th Class)

Introduction

This Syllabus is intended to assist candidates studying for the International Power Engineer (5th Class) Examination.

Recommended Study Program:

It is recommended that, before undertaking this examination, the candidate completes Power Engineering Course of study, offered through a recognized and approved technical institute or training provider which addresses the Syllabus Outline.

International Power Engineer (5th Class)

Syllabus

Reference Syllabus for International Power Engineer (5th Class) Examination Candidates

Major Topic: Low Pressure Boiler Components and Operation

Unit 1: Boiler Details

Topic 1 Watertube Boilers (Heating, Power, and Tubular)
Topic 2 Cast-Iron Sectional and Modular Boilers
Topic 3 Firetube Boilers (Heating and Power)
Topic 4 Electric Boilers

Unit 2: Boiler Fittings and Controls

Topic 5 Basic Fittings for Steam Boilers
Topic 6 Basic Fittings for Hot Water Boilers
Topic 7 Low Water Fuel Cut-Offs and Feedwater Controls
Topic 8 Heating Boiler Operating Controls
Topic 9 Boiler Combustion Controls
Topic 10 Boiler Programming Controls

Unit 3: Boiler Operation and Maintenance

Topic 11 Basic Boiler Operation
Topic 12 Routine Boiler Maintenance and Inspection

Unit 4: Fuels and Combustion

Topic 13 Combustion and Draft
Topic 14 Burners for Boilers

Unit 5: Piping and Valves

Topic 15 Piping Materials and Connections
Topic 16 Piping Expansion, Support, and Insulation
Topic 17 Steam Traps
Topic 18 Introduction to Valves

Unit 6: Thermoil Systems

Topic 19 Introduction to Thermoil Heaters and Systems

Major Topic: Elements of Human Comfort in Facility Operation

Unit 1: Heating Systems and Human Comfort

Topic 1 Heat Gains and Losses
Topic 2 Steam Heating Equipment
Topic 3 Steam Heating Systems
Topic 4 Hot Water Heating Systems
Topic 5 Hot Water Heating System Equipment and Operation
Topic 6 Warm Air Heating System Equipment
Topic 7 Warm Air Furnace Components and Maintenance
Topic 8 Ventilation and Air Filters
Topic 9 Infrared and Electric Heating
Topic 10 Humidification
Topic 11 Electric Controls for Heating Systems

Unit 2: Plumbing and Auxiliaries

Topic 12 Building Water Supply Systems
Topic 13 Sanitary Drainage Systems

Unit 3: Lighting

Topic 14 Lighting Systems

Unit 4: Refrigeration

Topic 15 Refrigeration Theory
Topic 16 Refrigerants
Topic 17 Compression Refrigeration Systems
Topic 18 Refrigeration Compressors
Topic 19 Heat Exchangers for Refrigeration Systems
Topic 20 Refrigeration Accessories
Topic 21 Cooling Towers
Topic 22 Air Conditioning Systems

Unit 5: Refrigeration and AC System Controls

Topic 23 Refrigeration Metering Devices and Capacity Controls
Topic 24 Refrigeration Cycle Controls
Topic 25 Compression Refrigeration System Pre-Startup Procedures
Topic 26 Compression Refrigeration System Operations

Unit 6: Pumps and Air Compressors

Topic 27 Air Compression
Topic 28 Types of Pumps
Topic 29 Pump Operation and Maintenance
Topic 30 Lubrication
Topic 31 Types of Bearing Lubrication

Unit 7: Distributed Generation

Topic 32 Microturbines
Topic 33 Internal Combustion (IC) Engine Gen-Sets

Major Topic: Basic Physical Science, Safety, and Regulation for Facility Operations

Unit 1: Provincial Acts, Regulations, and Adopted Codes

Topic 1 Boiler and Pressure Vessels Act
Topic 2 Introduction to CSA and ASME Codes for Boilers

Unit 2: Basic Math

Topic 3 SI Units
Topic 4 Basic Arithmetic Operations
Topic 5 Transposition
Topic 6 Areas and Volumes of Solids

Unit 3: Applied Science

Topic 7 Application of Basic Mechanics
Topic 8 Introduction to Thermodynamics

Unit 4: Safety

Topic 9 Fire Safety and Site Hazards
Topic 10 Building Safety
Topic 11 Confined Space Entry
Topic 12 Introduction to Occupational Health and Safety Legislation
Topic 13 Introduction to Heating Plant Safety
Topic 14 Handling of Dangerous Materials

Unit 5: Electricity

Topic 15 Introduction to Electricity

Unit 6: Welding

Topic 16 Welding Terms and Inspection

Unit 7: Water Treatment

Topic 17 Water Treatment

Topic 18 Monitoring and Testing

Unit 8: Communications

Topic 19 Technical Communications

Topic 20 Plant Diagrams