

FEE STRUCTURE (Part # 1 & 2)

Seminar & Examination

| Month | Seminar Dates | Exam Date | Seminar City | Exam City |
|-----------|---------------|----------------------------|--------------|------------|
| January | 24 - 30 | 31 st January | Chennai | Chennai |
| February | 21 - 27 | 28 th February | Chennai | Chennai |
| March | 24 - 30 | 31 st March | Mumbai | Mumbai |
| April | 23 - 29 | 30 th April | Chennai | Chennai |
| May | 23 - 29 | 30 th May | Chennai | Chennai |
| June | 23 - 29 | 30 th June | Chennai | Trichy |
| July | 24 - 30 | 31 st July | Chennai | Chennai |
| August | 23 - 29 | 30 th August | Chennai | Chennai |
| September | 22 - 28 | 30 th September | Mumbai | Mumbai |
| October | 24 - 30 | 31 st October | Chennai | Chennai |
| November | 23 - 29 | 30 th November | Chennai | Chennai |
| December | 22 - 28 | 29 th December | Chennai | Coimbatore |

A/C - Accommodation Rs.5000/-**
Charges

Re-Exam Fee US \$ 600

Re-Training Rs.20,000/-*

Examination Fee US \$ 750

Seminar Rs.30,000/-*

*Service Tax Applicable as per Govt. Norms @ 12.36%
** For the entire seminar days of Accommodation.

ONE YEAR COMPLIMENTARY BETZ MEMBERSHIP INCLUDED

Appropriate Course materials will be provided well-in advance during registration, to help you prepare for the exam. Seminar kit will be provided during the first day of seminar.



Lunch and Refreshments will be provided during the seminar event.



After completion of the seminar and 40 hours Training, Course completion certificate will be provided.



A/C Accommodation will be provided during the seminar on first come first serve basis. (10 Rooms / 20 Bed only)

AWS SCHEDULE - 2015 FOR UAE & QATAR

| Months | Location | Seminar Dates | Exam Date |
|-----------|-------------|-------------------------------------|------------------|
| March | Dubai, UAE | 9 th - 14 th | 15 th |
| April | Doha, Qatar | 11 th - 16 th | 17 th |
| August | Dubai, UAE | 8 th - 13 th | 14 th |
| September | Doha, Qatar | 12 th - 17 th | 18 th |



AN ISO 9001 : 2008

BETZ ENGINEERING & TECHNOLOGY ZONE

EDUCATIONAL & RESEARCH DIVISION

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American Welding Society
INTERNATIONAL CERT



American Welding Society
INTERNATIONAL CERT



BETZ is the only Accredited Test Facility in India for American Welding Society, USA.

BETZ is also an International Agency for AWS to conduct Seminars and Certification Exams.

AWS - CWENG



Certified Welding Engineer

Part # 1 & 2

CALENDER FOR THE YEAR - 2015

AWS Certification - a passport to rewarding career

www.welding-certification.com

About Us

BETZ Engineering & Technology Zone is an accredited International Agency for American Welding Society, Florida, USA, to conduct seminars and certification programs for AWS in India and Worldwide. BETZ is an ISO 9001:2008 company, also BETZ is the only "ATF-Accredited Test Facility" by AWS to evaluate and certify welders in India.

About AWS-CWENG

A person with the demonstrated education, experience and knowledge as defined by this information and who successfully passes the required examinations is considered to be a qualified AWS Certified Welding Engineer (CW Eng.)

The CW Eng. is capable of directing those operations associated with weldments and other types of joints that are completed in accordance with the appropriate contract documents, codes, and other standards to produce a satisfactory product. The welding engineer's activities begin before production or construction welding and continues through the production process then ending when the production process is complete.

ELIGIBILITY

| MINIMUM EDUCATION | MINIMUM WORK EXPERIENCE |
|--|-------------------------|
| Bachelor of Engineering (B.E) | 1 Year |
| Bachelor of Technology (B.Tech) | 2 Years |
| Bachelor of Science (B.Sc.) | 5 Years |
| Associate in Applied Science (A.A.Sc.) | 10 Years |
| High school or an equivalent program | 15 Years |

EXAM PATTERN

The AWS Certified Welding Engineer (CW Eng.) examination consists of four parts. Parts 1 and 2 must be successfully completed in order to take Parts 3 and 4. The first two parts (1 and 2) of the exam are closed book and covers fundamentals of basic science and applied science. Exam will be of two hours for each part of written type with multiple-choice questions (total time of four hours). Part 1 consists of 35 questions of multiple choices and Part 2 has 25 questions of multiple choices. Both the Parts are given together and must be passed together. If the candidate fails in any one part, only that part must be repeated.

Examinations for Parts 3 and 4 are open book examinations on welding related disciplines and practical welding and related applications. Each examination is three hours in length (Duration). Part 3 has 45 questions of essay type. Part 4 has 39 questions of multiple choice types. Candidates that successfully pass Parts 1 and 2 will be invited to sit for Part 3 and Part 4 examinations and a separate application must be submitted to AWS.

Candidates must pass each of the four examinations with an individual score of not less than 60% and attain a minimum weighted percentage of 70% for all 4 Parts.

Seminar Pattern – Parts # 1&2

This Six days course focuses on the fundamental knowledge in **Basic Sciences (Part # 1)** of Mathematics, Physics, Chemistry and **Applied Sciences (Part # 2)** of strength of Materials, Heat Transfer & Fluid Mechanics and Electricity.

Part #1 – Basic Science Fundamentals

➤ 2 days seminar will be conducted to cover the fundamentals of basic sciences of Part-1 examination that covers all the facets of AWS B5.16, knowledge of mathematics, physics and chemistry.

Mathematics: Simple Calculations (multiple choices), Special Functions (exp, log), Trigonometric Functions (sin, cos, tan, cot, sec, csc, degrees, radians), Algebraic Equations (linear, quadratic, polynomial), Graphs And Equations (slope, intercept, roots, derivatives, minimum, maximum, interpolation and extrapolation), Geometry (common geometric shapes), Hyperbola, Parabola, Complex Numbers, Calculus (fundamentals of differential equations), Statistics (population and samples: normal distribution, mean, standard deviation and variance, Simple correlation: linear regression via least squares method, r2 correlation)

Physics: Unit Conversion (dimension, mass, temperature, time, energy, power), Mass, Weight, Volume, Density, Force, Energy, Work Done, Power, Stress, Strain, Hooke's Law (elasticity), Moment and Momentum, Temperature, Heat, Temperature Measurement, Thermocouples, Pyrometers, Thermal Properties of Materials (Thermal Conductivity, Thermal Expansion, Thermal stress and strain)

Chemistry: Symbols (elements and inorganic compounds—gases, fluxes, etc.), Molecular Weight and Stoichiometry, Acids and Bases, Balance Chemical Equations, Gas Combustion Reactions (chemical heat generation) and oxidation-reduction reactions, Ideal Gas Law (pressure, volume, temperature), Mass Balance (as in E7018 coating decomposition to gas, slag and metal), Bulk and Chemical Analysis Methodologies, Reactivity, Toxicity, Environmental Effect, Disposal.

Part #2 – Applied Science Fundamentals

➤ 3 days seminar will be conducted to cover the Applied science fundamentals of Part-2 examination that covers the area of strength of materials, heat transfer, fluid mechanics and electricity.

Strength of Materials: Load, Deformation (elastic and plastic, buckling), Stress- Strain, Young's Modulus, Shear Modulus, Stress- Strain Curve (yield stress, ultimate tensile stress, elongation) and tensile stress, Shear stress computation, Welded member/cross-section effect, Mechanical testing (tensile, bend, fracture toughness, hardness, creep, and fatigue) and data interpretation, Law of Conservation of Energy/Momentum, Stress analysis, Typical engineering material properties

Heat Transfer and Fluid Mechanics: Heat Conduction, Convection and Radiation, Thermal Conductivity and Diffusivity, Heat Transfer Coefficients of Engineering Materials and Fourier's Law, Heating Rate and Cooling Rate, Industrial Heating Methods, Power Consumption and Gas Flow Rates, Laminar and Turbulent Flow (Reynold's number), Dew Point and Relative Humidity, Pressure and Regulators Venturi Effect and Gas Velocity Calculation, Atmospheric Pressure and Hyperbaric Conditions, Vacuum Equipment and Measurements

Electricity: Current, Voltage, Resistance, Impedance and Circuits, Ohm's Law, Kirchhoff's Law, Resistance Loss and Current Rectification, Power Generation, AC/DC, polarity, Power Factor, Electromagnetic Properties, Right-Hand Rule, Current and Voltage Measurements (devices and principles)

➤ **1 day will be totally dedicated to discussion & review of Parts 1 and 2.**

Mode of Payment:

- ❖ The Seminar fees of Rs.30,000 + Rs. 3,708 (Service Tax) can be paid as Cheque/DD in favor of "BETZ ENGINEERING & TECHNOLOGY ZONE," payable at CHENNAI.
- ❖ The examination fees in US\$ 750 can be paid as Demand Draft in favor of "AMERICAN WELDING SOCIETY", Payable at USA.

All the necessary documents along with DD and filled registration form should be sent to (our Admin Office) following address:-

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