

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI - 51

| 1 | Name of Course | Certificate Course In Form Work & Bar Bending (304116) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|--|--|-------|-----------|------------|------------|--|---------|------------|-----------------|-------|-------|------------|------------|---|----------|-------------------------|------|-------|-----|----|---|----------|--|------|-------|-----|----|---|----------|-------------------------|-------|-------|-----|-----|--|--|--|--|--|-----|-----|
| 2 | Max. Nos. of Student | 25 Students | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Duration | 6 Month | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Type | Full Time | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Nos. Of Days / Week | 6 Days | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Nos. of Hours /Days | 7 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Space Required | Laboratory = 1000 Sq feet Class Room = 200 Sq feet TOTAL = 1200 Sq feet | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Entry Qualification | S.S.C. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Objective Of Syllabus/ introduction | Awareness of Safety precautions Knowledge of Engineering skill, use of tools in Construction. Awareness of Architecture. Awareness of Basic Plumbing. Awareness of Basic Building Construction. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Employment Opportunity | The trainee will either to be able to take up jobs with agencies which Maintain Develop and repair Form Work & Bar Bending or with working experience will be in a position to start his own independent Business. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Teacher’s Qualification | Diploma or Degree in Civil Engineering. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Training System | Training System Per Week | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Theory | | Practical | | Total | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 12 Hours | | 30 Hours | | 42 Hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Exam. System | <table><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks</th><th>Min. Marks</th></tr><tr><td>1</td><td>30411611</td><td>Form Work & Bar Bending</td><td>TH-I</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30411621</td><td>Basic Building Construction & Carpentry.</td><td>PR-I</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>3</td><td>30411622</td><td>Form Work & Bar Bending</td><td>PR-II</td><td>6 hrs</td><td>200</td><td>100</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>400</td><td>185</td></tr></table> | | | | | | Sr. No. | Paper Code | Name of Subject | TH/PR | Hours | Max. Marks | Min. Marks | 1 | 30411611 | Form Work & Bar Bending | TH-I | 3 hrs | 100 | 35 | 2 | 30411621 | Basic Building Construction & Carpentry. | PR-I | 3 hrs | 100 | 50 | 3 | 30411622 | Form Work & Bar Bending | PR-II | 6 hrs | 200 | 100 | | | | | | 400 | 185 |
| Sr. No. | Paper Code | Name of Subject | TH/PR | Hours | Max. Marks | Min. Marks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 30411611 | Form Work & Bar Bending | TH-I | 3 hrs | 100 | 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 30411621 | Basic Building Construction & Carpentry. | PR-I | 3 hrs | 100 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 30411622 | Form Work & Bar Bending | PR-II | 6 hrs | 200 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 400 | 185 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SYLLABUS

Form Work & Bar Bending

| Practical - II | Theory - I |
|---|---|
| <ul style="list-style-type: none"> • Visits of typical construction sites • Record observations related to form work and bar bending | <ul style="list-style-type: none"> • Technical terms used in form work & bar bending • Plain cement concrete (PCC) & Reinforced cement concrete (RCC) • Properties of PCC & RCC in green state and hardened state • Importance of form work and reinforcement in construction |
| <ul style="list-style-type: none"> • Measure dimensions and calculate relevant information | <ul style="list-style-type: none"> • Different types of measurement • Measuring instrument • Calculation of area, weight |
| <ul style="list-style-type: none"> • Read and interpret given blue prints | <ul style="list-style-type: none"> • Reading interpretation of given blue prints • Symbols, notations & conventions • Specifications |
| <ul style="list-style-type: none"> • Select appropriate material for form work at different locations • Erect form work at different locations • Identify defects & adjust form work • Remove form work safely | <ul style="list-style-type: none"> • Common terms used and their meanings • Different material used for form work • Techniques of fixing forms at different location • Defects in form work • Deshuttering /removal of forms • Form release agents • Maintenance & repair of form work • Precaution in form work |
| <ul style="list-style-type: none"> • Read & interpret a given blue print • Estimate quantity of steel and binding wire required for a given job • Prepare bar bending schedule under the guidance of instructor • Carry out all the operations following guidelines & codes • Demonstrate quality standards in all the practices | <ul style="list-style-type: none"> • Technical terms & their meanings • Symbols, conventions used in bar bending • Specifications of material • Physical properties of reinforcing bars • Estimate the quantity of material • Structural elements & characteristics (simply supported, continuous, fixed, cantilever, overhang) • Importance of use of reinforcement in concrete • Tools used in bar bending • Correct use of tools • Different operation in bar bending (straightening of bars, cutting of bars, bending of bars, placing of bars, binding of bars, fixing of cover blocks) • Use of relevant BIS codes & tables • Guidelines for laying reinforcement |

List of equipment, tools and instruments

| Sr. No. | Item/ Specification | Quantity proposed for a batch of 25 trainees |
|---------|--|--|
| 1. | Measuring tape 15 mtr. (steel) | 4 |
| 2. | Measuring tape 3 mtr. (steel) | 4 |
| 3. | Try square | 4 |
| 4. | Bevel | 4 |
| 5. | Marking point | 4 |
| 6. | Tenon saw, dovetail saw | 4 each |
| 7. | Chiesel (different suitable sizes) | 4 sets |
| 8. | Hammer 500 gm. | 4 |
| 9. | Hammer 1 kg. | 4 |
| 10. | Hammer 5 kg. | 4 |
| 11. | Bar bending table | 2 |
| 12. | Bending pipes (suitable diameter and length) | 2 each |
| 13. | Bar bending lever (suitable diameter and length) | 2 sets |
| 14. | Manual bar bending machine of suitable size | 2 |
| 15. | Portable hand bender of suitable size | 2 |
| 16. | Power cutter of suitable size | 2 |

Basic Building Construction Basic Carpentry

| Practical - I |
|---|
| Introduction with buildings about different parts of the building and draw a neat sketch passing thro' door, window, and roof of multi stories building, orientation and ventilation of building. |
| Introduction by showing the different types of materials i.e. bricks, stones, tiles, cement, sand, aggregates, lime, steel, timber, earthen ware, Standard size of local market bricks available in your locality, site visit of brick kiln showing the manufacturing of bricks, field test of cement. Etc. |
| Construction of different types of foundation, Layout of foundation plan on the ground, reading of map, laying of concrete in foundation, ratio of foundation concrete. Transfer of center line with Plumb Bob in the excavated trench, laying of D.P.C. |
| Tools of Brick masonry, how to use the tools of brick masonry, construction of wall and corner junction of wall in super structure and foundation in English Bond and Flemish Bond, Stretcher Bond, Header Bond in pillars and walls etc. Zig-Zag Bond, Hearing Bone Bond in Brick flooring etc |
| Centering and Shuttering of different types of Arches, Construction of Arches and construction of different types of Roofs, laying of Reinforcement of RCC flat Roof and Reinforced Brick Slab Roof, Terracing of roof, First and second class mud Roof, Jack Arch Roofs, its method of construction. |
| Construction of all types of floors, making of formation level, laying of Base Layers, laying of Topping, etc. |
| Surface plastering ½" (12.5 mm to 20 mm) thick in various ratios of cement and mortar. Ceilings plaster, Curing of plaster. |
| White Washing, three coats for new plastered surface, colour wash, lime paint, cement paints, applying enamel paints to the wood work, Steel work, etc. including primary coat. |
| Importance of the subject introduction with workshop safety precautions, fire fighting equipments etc. |
| Identification of hand tools demonstration and using measuring, sawing practice using different types of saws, and planes etc. |
| Ripping , cross cutting , curve cutting , oblique sawing .use of sawhorse , bench hook , Bench vice , Bench stop etc , Identification of timber , showing defects knots , shakes , grains etc . |
| Planning practice: planning face side , face edge marks use , of marking gauge etc , testing of accuracy flatness , twist ness of surface . use of straight edge bench stop , try square , cross planning , edge planning , planning piece of size , grinding , sharpening of plan blade etc . |
| Demonstration and making of joints. Framing joints: halving joints, trenching, housing joints, mortised and tanon joint , Door joint , bridle joint , dovetail joint , lap dovetail joint , miter joint etc |
| Broadening joint: simple butt, slot screw joint, pocket screw joint, tongue and groove butt joint, etc. |
| Lengthening joints: slopping scarf, racking scared, half lapping scarf , table scarf joint etc. |

List of Tools and Equipments Basic Carpentry

| Sr. No. | Description | Quantity |
|---------|--|----------|
| 1 | Flexible tape role steel (3 meter) | 10 |
| 2 | Try Square (20 mm) | 10 |
| 3 | Square bevel | 10 |
| 4 | Marking Gauge (Wooden) | 10 |
| 5 | Hand Saw 450 mm | 10 |
| 6 | Saw tenon 300 mm | 10 |
| 7 | Jack plane metal 335 mmx 50 mm cutter | 10 |
| 8 | Plane smoothing metal 250 mmx 50 mm cutter | 10 |
| 9 | Chisel firmer (bevel edge) 6, 10, 15, 20, 25mm with (5 nos.) | 10 |
| 10 | Chisel mort ice 6,10,15, (3nos) | 10 |
| 11 | Screw driver (300 mm) | 10 |
| 12 | Wooden mallet (medium size) | 10 |
| 13 | Hammer claw (500gms) | 10 |
| 14 | Carborandom stone (200x 50x 25mm) | 10 |
| 15 | Hand brush for bench cleaning (400mm) | 10 |
| 16 | Screw Driver 250 mm | 04 |
| 17 | Pincer 50mm | 04 |
| 18 | File Half Round 2nd Cut 250mm | 08 |
| 19 | File half wood rasp bastard 300mm | 08 |
| 20 | File slim taper 100 mm | 08 |
| 21 | Card File (Steel) wire brush for file | 08 |
| 22 | Electrically operated motorized cutter | 4 |