

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI

1	Name of Course	Certificate Course in Glass Kiln Operator										
2	Max no. of Students	25		Course Code - 411173								
3	Duration	6 month										
4	Course Type	Full Time										
5	No. of Days per week	6 days										
6	No. of hours per day	7 Hrs										
7	Space require	Theory Class Room – 200 sqft Practical Lab – 1000 sqft Total – 1200 sqft										
8	Entry qualification	S.S.C. Pass										
9	Objective of syllabus	To teach various skills and workmanship practices about Glass Kiln Operator										
10	Employment opportunities	After completion of this training the Participant would be able to: work as Glass Kiln Operator in Glass manufacturing industry										
11	Teachers Qualification	Diploma / Certificate Course in concern field.										
12] Teaching Scheme –												
Training System per Week												
<table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>12 Hours</td><td>30 Hours</td><td>42 Hours</td></tr></table>							Theory	Practical	Total	12 Hours	30 Hours	42 Hours
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12 Hours	30 Hours	42 Hours										
13] Examination Scheme –												
Sr	Paper code	Name of Subject	TH/PR	Hours	Max. Marks	Min Marks						
1	41117311	GLASS KILN OPERATOR	Theory - I	3 Hrs	100	35						
2	41117321	GLASS BATCH MAKER	Practical - I	3 Hrs	100	50						
3	41117322	GLASS BALL MAKER	Practical - II	6 Hrs	200	100						
		Total			400	185						

Glass Kiln Operator

Glass Kiln Operator - Theory - I
Knowledge of characteristics, properties, and usage of soda-potash glass, borosilicate glass, and lead-based glass. Knows about the various types of glass available for using in kiln, and the products that can be made using the kiln
Knowledge of SI (le Système international d'unités) scale of units, formulae.
Knowledge of various colour names and shades. Must be standardised to a specific palette type. Should know about social indications of specific colours.
Understanding importance of communication, instructions, and specifications given to perform tasks.
Knowledge of different fuel-based kilns (electric, gas-fired), different loading orientation kilns (front-loader, top-loader). Knowledge of glass cutter (oil-cutter with diamond-topped wheel) to cut straight and curved shapes, and a round glass cutter to cut circles. Knowledge of pliers to break the glass, hand grinders, rulers and scales, and drawing papers, pens and pencils. Also sifters/sieves for colour application.
Knowledge about Glass & its Industrial uses. Knowledge of different raw materials used in Glass Industry.
Introduction to Sieve Nos & its brief description. Knowledge of differentiate between Laboratory Scale & Industrial Scale.
Knowledge of selection the Sieves:- As per oversize grains & undersize grains.
Knowledge of Safety aspects of Sieving process
Knowledge of Magnetic process.
Knowledge of separation the Sieves by Magnetic process.
Knowledge of Washing & Drying of sand.
Knowledge about Cullet. Process of handling of Cullet. Knowledge of Safety aspects of Cullet handling.
Knowledge of process of Sorting the Cullet & their Storing..
Knowledge about Crushing operation of Cullet.
Knowledge of Safety aspects of Cullet crushing.
Calculation of area, volume, weight , density & specific gravity, Knowledge of proportionate weight of Cullet & other raw materials & proper mixing with precautions..
Calculation of area, volume, weight , density & specific gravity, Knowledge of proportionate weight of Cullet & other raw materials & proper mixing with precautions..
Knowledge of different molten glass.
Knowledge about Heat, Temperature, pressure, viscosity, surface tension boiling point, melting point, Boils law, Charles law etc & calculates the temperature, pressure, Boils & Charles Law etc. Knowledge about boiling & melting points of Glass & to measure by Instruments.
Knowledge of Viscosity & Surface tension of Glass & Instruments used.
Knowledge for movements of molten Glass under gravity.
Knowledge of rotation on movement the molten Glass & its effects.
Knowledge about variation of Viscosity of Glass with Temperature.
Knowledge about working range of Temperature.
Knowledge of Gathering Temperature, Glass Gathering Rods/ pipes.
Knowledge of safety at the time gathering glass.
Knowledge of gathering the Glass & transfer to Gob.

Glass Batch Maker - Practical – I
Differentiate between various types of glass products according to (a) quality of glass, and (b) methods of manufacturing of product. Select the correct type of glass to make a certain product in a kiln
Measure glass using different units of measurement (of distance – length, breadth, width; of area, of volume etc)
Differentiate between various shades of a colour
Safely and correctly operate equipment, tools, and handle raw materials
Use the various common tools required in kiln-formed glassmaking Perform glass cutting (prefusing/ slumping) according to given specifications
Operate a kiln as required to prepare a specific product Perform basic fusing of glass in a kiln according to given specifications Perform basic slumping of glass in a kiln according to given specifications
Demonstrate use of different raw materials in Glass Industry with use of different hand Tools/ equipments
Practice to Sieve the glass with different process
Practice to use the Sieves in Laboratory Scale.
Practice to use the Sieves in Industrial Scale.
Practice by Magnetic Separation.
Practice Magnetic Separation the Sieves.
Practice Washing & Drying of sand by Laboratory Scale.
Practice on handling the Cullet.
Maintain the safety aspects of Cullet handling.
Practice sorting of cullet & storing.
Practice crushing the Cullet.
Practice crushing the Cullet with requisite precautions.
Practice to mix the raw materials & Cullet as per weight to make Batch.

Glass Ball Maker - Practical - II
Differentiate between various types of glass products according to (a) quality of glass, and (b) methods of manufacturing of product. Select the correct type of glass to make a certain product in a kiln
Measure glass using different units of measurement (of distance – length, breadth, width; of area, of volume etc)
Differentiate between various shades of a colour
Safely and correctly operate equipment, tools, and handle raw materials
Use the various common tools required in kiln-formed glassmaking Perform glass cutting (prefusing/ slumping) according to given specifications
Operate a kiln as required to prepare a specific product Perform basic fusing of glass in a kiln according to given specifications Perform basic slumping of glass in a kiln according to given specifications
Demonstrate the different nature of molten glasses.
Demonstrate to use different Instruments to take measurements of molten glass.
Practice to use the Instruments to measure the Viscosity & Surface tension of molten glass.
Demonstrate movement the molten Glass.
Demonstrate movement of molten Glass on rotation.
Demonstrate variation of Viscosity of Glass with Temperature.
Practice on Glass gathering & Gob transfer.
Practice to make the Ball by rotating the molten Glass with Safety & Precautions taken.
Precautions taken at the time gathering glass.
Checking & Testing of glass Ball.

Lists of Tools & Equipments

- 1 Crushing machine 1 no
- 2 Hammer(Copper) 8 nos
- 3 Tongs 8 nos
- 4 Basket 4 nos
- 5 Ball peen hammer 8 nos
- 6 Cross peen hammer, 8 nos
- 7 D/E spanner 2 sets
- 8 Screw driver 8 nos
- 9 Steel rule 8 nos
- 10 Grease gun 8 nos
- 11 Chisel 8 nos
- 12 Oil cane 8 nos
- 13 Pliers 8 nos
- 14 Goggles(Fiber plastic cup) 10 pairs
- 15 Hand gloves 10 nos
- 17 Safety shoes 10 pairs
- 18 Fire Extinguisher 1 no
- 19 Adjustable wrench 1 no
- 20 Balance 1 no
