



<https://shikshamentor.com/building-material-and-construction-sem-ii-msbte-k-scheme/>

312338 – Building Material & Construction
(Sem II)

As per MSBTE's K Scheme
CE / CR / CS / LE

Unit I		Overview of construction Materials	Marks - 12	
S. N.	MSBTE Board Asked Questions	Exam Year	Marks	
1	List any four artificial construction materials	S-18	2M	
Ans.	Artificial construction materials. <ol style="list-style-type: none"> 1. Cement. 2. Brick. 3. Concrete. 4. Mortar. 5. Tiles. 6. Glass 			
2	• State the factors on which the selection of type of materials depend. OR	S-18	2M	
	• Describe the factors for selection of construction materials on the basis of strength.	S-18	4M	
	• Explain the criteria for selection of construction materials for different civil engineering Structures on basis of their strength and durability.	W-18	4M	
	• Write any four criteria for selection of construction materials.	S-23	4M	
Ans.	Factors for selection of materials. <ol style="list-style-type: none"> 1. Carry prescribed loads : The most significant requirement of a material used in civil engineering project is that it should be able to carry the design loads. 			

	<p>2. Durability : Selection of material should be such that it should sustain designed load for design duration or period. It should resist the weathering action caused by wind, rain, snow etc.</p> <p>3. Economical : In most of the cases, the cost of raw material account about the finished cost. Obviously the cost of the material is a major factor which influences the choice of the material or process.</p> <p>4. Environmental friendly: A construction material should satisfy all strength, serviceability, and architectural requirement and at the same time, must not cause environmental problem. Aesthetically pleasing: Most non-structural materials such as floor coverings, paints, and doors and window are chosen based on aesthetic consideration.</p>		
3	State the role of civil engineer in the field of transportation engineering.	S-18	4M
Ans	<p>Role of civil engineer in the field of transportation engineering.</p> <ol style="list-style-type: none"> To maintain safety, adequacy and economy in the means of transport for the need of society. Civil engineer work to move people, goods and materials safely and efficiently from one place to another place. Civil engineer designs, constructs and maintains all types of transportation facilities, including airport, highway. Railway track and docks and harbours. Civil engineers are also involved in the construction of bridge tunnels etc. Remote areas and rural areas become accessible and communicable if connected by proper means of transport. 		
4	Enlist any two natural and artificial construction materials.	W-18	2M
Ans.	<p>Natural construction materials- Stone, Timber, Lime , Soil</p> <p>Artificial Construction Materials – Bricks, Tiles, Cement, Aggregate, Artificial Sand, Plywood and Glass</p>		
5	<ul style="list-style-type: none"> Describe the scope of construction material in environmental engineering. State the role of civil engineer in the field of Environmental Engineering. 	W-18	4M
		W-19	4M
Ans	The goal of environmental engineering is to ensure the community development and the sensible use of water, land and air resources to make them sustainable. This goal is achieved by managing these resources so that environmental pollution and		

	<p>degradation is minimized.</p> <p>For managing various construction activities related to environmental engineering for water supply and sewerage, water treatment, sewage treatment, solid waste management practices, various types of material are required. In addition, other activities of wastewater treatment facilities in municipalities and industries, disposal and reuse of waste water and the collection, transportation, processing and disposal of solid wastes various types of construction material such cement, sand , aggregate, stone, lime, iron, glass, artificial sand , waterproofing and damp proofing material of required quality and quantity is used.</p>		
6	State the role of civil engineering in human life	W-19, S-23	2M
Ans	<p>The Civil Engineering plays an important role in human life in the following ways:</p> <ol style="list-style-type: none"> 1. Designing and construction of infrastructure 2. Includes roads, bridges, dams, canals, buildings, water supply and other facilities 3. Electricity generation by constructing dams 4. Water supply for drinking, agriculture, waste disposal etc. is also done by civil engineers. 		
7	List any four applications of Irrigation engineering	W-19	2M
Ans	<p>The applications of irrigation engineering are:</p> <ol style="list-style-type: none"> 1. Construction of dams, canals, spillways etc. 2. Supplying Water for Agriculture, Drinking Etc. 3. Irrigation engineering also deals with the various systems of irrigation such as sprinkler, drip etc. to supply water in farms 4. Ground water storage can also be developed by constructing percolation tank 5. It ensures water supplies during the periods of less rainfall or during summer when water is not available in abundance 		
8	<ul style="list-style-type: none"> State the materials for different civil engineering structures. List broad classification of materials Give broad classification of construction materials 	S-19	2M
		W-22	2M
		S-23	4M
Ans	<ol style="list-style-type: none"> 1. Natural materials- Stone,Sand,Timber etc.. 2. Artificial materials- Brick, Tile, Cement etc. 3. Special materials- Fibre, Bitumen etc. 4. Finishing materials- POP, Wall Cladding etc. 		

	5. Recycled materials- Fly Ash, Rice Husk etc.		
9	State the materials required for irrigation structures in general.	S-19	2M
Ans	1) Cement 2) Aggregate 3) Sand 4) Soil 5) Brick 6) Fly Ash 7) Tiles 8) Stones 9) Steel 10) Bitumen etc.		
10	Describe the broad classification of materials.	S-19	4M
Ans:	<p>Materials can be classified into following types:</p> <ol style="list-style-type: none"> 1) Natural materials 2) Recycled materials 3) Artificial materials 4) Special materials 5) Finishing materials <p>1) Natural construction materials:-</p> <p>a) Stone- stone is naturally available from rocks by quarrying process. It is dressed to be used for foundation, walls, floorings, kitchen otta etc. It is most strong and durable material.</p> <p>b) Timber- timber is used worldwide as construction material. It is useful for formwork, centering, scaffolding, doors and window frames, shutters, for furniture, as roofing materials, for making railway sleepers, temporary bridges.</p> <p>c) Bituminous materials and mixtures:-asphalt, bitumen and tar are widely used materials. They are obtained from petroleum and used in road construction and for water proofing. They can be used in the form of emulsion, cutback, mastics, sheet rolls etc.</p> <p>d) Lime- lime is obtained from limestone by process of calcination in which carbondioxide and moisture is removed. $CaCo_3 \rightarrow CaO+CO_2$</p> <p>e) Soil- soil is naturally obtained from disintegration of rocks when they are exposed to atmosphere by weathering agents like sun, wind, rain, frost etc. Soil is used as construction and foundation material. It is used for making earthen dams, canals, embankments. WBM roads. Clay is used in manufacturing of bricks andtiles. Sand is used in filter bed.</p>		

2) Recycled construction materials:-

a) Rice husk- it is a natural hard coating over rice grain. Rice husk is difficult to burn.

The ash has insulating property. It has pozzolonic properties so it is used in manufacturing of bricks and alternative to cement for mortar, foundation and concreting.

b) Bagasse-it is fibrous residue left after sugarcane stalks are crushed to extract juice. It is rich in alumina, iron and silica and possesses pozzolonic property. The ash can be mixed in cement or concrete. Bagasse is used in manufacturing of boards, bricks, bio fuels, papers etc.

c) Coir Fibers-It is obtained from coconut husk which are present in covering of fruit. There may be green, white or brown coir fibers. It is mixed with cement mortar as it increases impact and tensile strength.

d) Straw-It is agricultural by product .It is dry stalk of cereal plants like rice, wheat and barley etc. after the grains and chaff is removed. It can be used to bind clay and concrete, for insulation purpose and for roofing.

e) Fly ash-Fly ash is produced during combustion of coal generally in power plants. It comprises of very fine particles. It possesses pozzolonic property so it is used in construction as alternative to cement. It is also used in brick manufacturing and soil stabilization.

f) Construction waste-It is obtained at construction site after completion of site and after demolition of old structures. It is used in pavement filling, plinth filling and to prepare low grade concrete.

3) Artificial construction material:-

a) Bricks- Bricks are made up of clay. They are used in brick masonry construction.

b) Tiles- Tile is used for Flooring and roofing. Various types of tiles are available in market like Vitrified, Shahabad, Mosaic etc

c) Cement- Cement is a fine grey powder which forms a paste with addition of water. With due time it sets and becomes hard. It is mixture of calcareous, argillaceous or siliceous material burnt in a furnace which forms stone like mass. It is then grinded to fine powder called cement.

d) Aggregate- Aggregates are the materials basically used as filler with binding material in the production of mortar and concrete. They are derived

from igneous, sedimentary and metamorphic rocks

e) Precast concrete product- These are the units casted or manufactured in industries or on site. They are ready to use materials thus going speedy Construction

f) Artificial Sand- The sand which is obtained from stone crusher after crushing the natural stone.

g) Particle board -Particle board is manufactured using chips or particles of low grade wood or sawdust mixed with strong adhesive and then compressed together under high pressure.

h) Veneers- Veneers are thin sheets of wood or slices of wood of superior quality obtained by rotating a log a wood against a sharp cutter or saw. The thickness of veneers varies from 0.4mm to 0.6mm or more.

4) Special construction material

a) Damp-proofing: Damp proofing is a treatment given to the building components during Construction to prevent entry of moisture.

b) Water-proofing- In building construction, mortar brick, stone and concrete are having tendency to get deteriorated due to passage of time. Due to which cracks and pores are formed in this material and water leakage occurs. This leakage of water is stopped by using special materials called as water proofing materials.

c) Thermal insulating material- The thermal insulating material is used to conserve a constant heat or temperature inside the building, irrespective of the temperature changes outside.

d) Artificial Timber - The timber which is converted in a factory by some mechanical processes is termed as 'Artificial timber'. And such timber possesses desired shape, appearance, strength and durability. It is a wood substitute made from solid waste like fly ash, silica, bituminous, and other bio-degradable material.

e) Geo-synthetic materials- Geo-synthetics are man-made materials used to improve soil conditions. 'Geo' means earth or soil and synthetic means man-made

f) Fibre: Fibre is a class of materials that are continuous filaments or are in discrete elongated pieces, similar to length of thread.

5) Finishing construction material:-

- a) Plaster of Paris-A white powder that sets to a hard solid when mixed with water, used for making sculptures and casts, as an additive for lime plasters, and for making casts for setting Broken limbs.
- b) Mortar- when some binding materials such as cement or lime is mixed with inert material such as sand, surkhi or cinder and lubricating material such as water is added to it, a paste is formed which is plastic in nature, this paste is known as mortar.
- c) Wall Cladding- Wall cladding is a process of finishing the surface with tiles.
- d) Paints- paints are applied on the surfaces of timber, metals and plastered surface as a protective layer and at the same times to get pleasant appearance
- e) Tiles- Tile is used for Flooring and roofing. Varies types of tiles are available in market like Vitrified, Shahabad, Mosaic etc

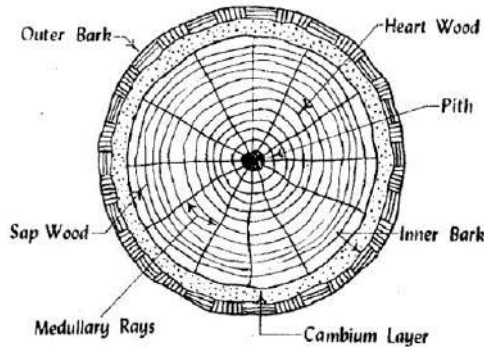
Note:- Student may write any two descriptions. So accordingly credit to be given.

11	Enlist any four natural materials used in construction.	W-22	2M
Ans.	1. Stone 2. Sand 3. Wood 4. Bitumen 5. Lime 6. Soil		
12	Enlist any four applications of steel in Civil Engineering.	W-22	2M
Ans.	Following are the applications of steel in Civil Engineering: 1. CI (Cast Iron) is used in making rainwater and sanitary pipes. 2. Wrought iron is used in making nails, wires, chains. 3. Square bars are used in making grills. 4. Rolled steel sections are used in making beams, columns and trusses. 5. Corrugated sheets are used for roofing known as GI sheets. 6. Carbon steel is used for making tools. 7. Weld meshes are used for partition and fencing.		
13	Describe the scope of construction material in Irrigation Engineering.	W-22	4M
Ans	1. Irrigation engineering is the branch of civil engineering which deals with the development of water resources and proper arrangement of distribution of		

	<p>water from the source developed.</p> <ol style="list-style-type: none"> 2. Development of water resources at the right place. 3. It determines the capacity of reservoir. 4. It helps to study the flood control devices. 5. It helps to study the design of different structures such as spillways,weirs and controls. 6. It ensures water supply during periods of less rainfall or during summer when water is not available in abundance. 		
14	Write any four criteria for selection of construction materials.	S-23	4M
Ans.	<p>Following are the criteria for selection of construction materials:</p> <ol style="list-style-type: none"> 1) Prescribed load: It is a design load which can be taken by the construction material. The material should have sufficient strength to carry prescribed loads. 2) Serviceability: Material should be selected in such a way that it should provide the optimum serviceability. 3) Aesthetically pleasing: The material used for the construction purpose should be aesthetically pleasing in appearance. It should be attractive to look at, or pleasing to experience, determine its aesthetic appeal. 4) Economical: Cost the material used for construction should be low as possible. 5) Environmental friendly: Material should be selected in such way that it should not disturb the eco-system of environment and the required material should be eco-friendly or environmentally friendly. 		

15	<p>Suggest the type of glass used for the following work:</p> <p>i) Making panel of partition wall</p> <p>ii) Cashier Cabin</p> <p>iii) Skylight</p> <p>iv) Door Shutter</p>	W-19	4M
Ans	<p>i) Making panel of partition wall: Block glass OR Sheet Glass OR chipped and ground glass OR soda lime glass</p> <p>ii) Cashier Cabin-Polished plate glass OR bullet proof glass OR soda lime glass OR laminated glass</p> <p>iii) Skylight: Wired glass OR rolled figured glass OR clear window glass or lead glass</p> <p>iv) Door Shutter: Soda lime glass OR tempered glass</p>		
16	Define bitumen and state different forms of bitumen.	S-23	2M
Ans.	<p>Bitumen:</p> <p>Bitumen is a non-crystalline solid or viscous material derived from petroleum, by natural or refinery process.</p> <p>Following are the different forms of bitumen:</p> <ol style="list-style-type: none"> 1) Bitumen emulsion. 2) Blow bitumen. 3) Cut-back bitumen 4) Plastic bitumen. 5) Straight run bitumen. 		
17	State the requirements of a good building stone.	S-23, W-18	4M
19	<p>Following are the requirements of a good building stone:</p> <ol style="list-style-type: none"> 1) It should have high crushing strength more than 100 N/mm². 2) It should have high durability. 3) Hardness should be more than 14. 4) It should have pleasing appearance and should retain its colour for longer time. 5) Water absorption should be less than 0.6% by weight after 24 hours. 6) It should be easy for cutting and dressing. 7) It should have good fire resistance. 8) Specific gravity should be more than 2.7. 9) It should be economical and easily available. 		

	<p>10)It should have good weathering resistance.</p> <p>11)It should have high impact value and high toughness index.</p>		
19	<ul style="list-style-type: none"> • Draw a cross section of trunk of tree. • Draw a neat sketch of structure of timber and label the parts. • Draw a neat sketch of cross-section of an exogenous tree and label the parts. • Draw cross section of timber. Give any four engineering properties of timber. 	S-23	4M
		W-22	4M
		S-18	4M
		W-19	4M



Ans.

Properties of Timber:

1. **Appearance:** A Freshly cut timber should have shining appearance
2. **Colour:** The Colour of the timber should be dark. Light colour of timber indicates low strength.
3. **Durability:** A Good timber should be durable. It should be capable of resisting insects and other agencies. It should be long-lasting
4. **Fire resistance:** Timber is a bad conductor of electricity and heat. It should not catch fire easily.
5. **Smell:** A Good timber should have sweet smell, unpleasant smell indicates decayed timber
6. **Seasoning:** The Timber should be well seasoned
7. **Strength:** A Good Timber should be sufficiently strong and should be capable of taking loads.
8. **Toughness:** It should be capable of resisting shocks
9. **Defect:** Good timber should be free from defects
10. **Texture:** The texture of timber should be even.

20	State and give function of any four constituents of a good brick earth.	S-23	4M
Ans.	<p>The Good brick earth should contain the following constituents:</p> <ol style="list-style-type: none"> 1. Silica. 2. Alumina. 3. Lime. 4. Iron oxide. 5. Magnesia. <p>Functions of Constituents of Good Brick Earth:</p> <ol style="list-style-type: none"> 1. Silica: <ol style="list-style-type: none"> a) It is responsible for preventing cracking, shrinking and warping of raw bricks. b) It also affects the durability of bricks. c) If present in excess, then it destroys the cohesion between particles and the brick becomes brittle. 2. Alumina: <ol style="list-style-type: none"> a) It is responsible for plasticity characteristic of earth, which is important in moulding operation. b) If present in excess, then the raw brick shrink and warp during drying. 3. Lime: <ol style="list-style-type: none"> a) It prevents shrinkage of bricks on drying. b) It causes silica in clay to melt on burning and thus helps to bind it. c) Excess of lime causes the brick to melt and brick loses its shape. 4. Iron Oxide: <ol style="list-style-type: none"> a) It gives red colour to the bricks. b) It improves impermeability and durability. c) It gives strength and hardness. d) If present in excess, then the colour of brick becomes dark blue or blackish. e) If the quantity of iron oxide is comparatively less, the brick becomes yellowish in colour. 5. Magnesia: <ol style="list-style-type: none"> a) Magnesium in brick earth imparts yellow tint to the brick. 		

	<p>b) It is responsible for reducing shrinkage</p> <p>c) Excess of magnesia leads to the decay of bricks.</p> <p>d) Water absorption is increased and the strength is reduced.</p>		
21	<ul style="list-style-type: none"> State any four requirements of good sand in construction. What are the requirements of good sand? 	W-22	4M
Ans.	<p>Requirements of Good Sand :</p> <ol style="list-style-type: none"> Silt Content should be less than 3% by weight (12% by volume in 10 min). Sand should be free from Organic materials, dust, clay etc. Sand shall not contain any harmful impurities such as iron, pyrites, alkalis, salts, coal or other organic impurities. Sand should be well graded. 		
22	State classification of aggregate according to sizes with applications in construction.	W-22	4M
Ans.	<p>Aggregate are divided into two categories:</p> <ol style="list-style-type: none"> Coarse Aggregate: The size of aggregate bigger than 4.75mm is considered as Coarse Aggregate. For example :Crushed stone particles, Brick bats, Slag Fine Aggregate: Aggregate whose size is 4.75mm and less is considered as Fine Aggregate. For example: River sand, Sea sand, Pit sand, artificial crushed stone sand. <p>Applications of Coarse aggregate:</p> <ol style="list-style-type: none"> In roads and railways as ballast, the aggregates are used to resist the static as well as dynamic load to distribute the load properly to the supporting ground and to drain water off the surface. In concrete aggregate is used for economy, reduces shrinkage and cracks and strengthens the structure. They are used in water filtration and sewage treatment processes. <p>Applications of Fine aggregate:</p> <ol style="list-style-type: none"> The most common use of sand is in making mortars. Sand is mixed with cement and water to make concrete. Sand is used in the manufacture of brick, glass and other materials. It is used as a media for the filtration of water. Sand is also found as a landscaping material, and as a substitute for soil to change its characteristics. Sand is used to make castings, and as an abrasive agent like blasting sand. 		

23	State the suitability of soil as a construction material.	W-22	4M
Ans.	<p>Soil is a very useful material in civil engineering. Its easy availability and low cost make it a very versatile and widely used material in the following way</p> <ol style="list-style-type: none"> 1. Clayey soil is generally used in the formation of clay bricks and also used for various construction operations. 2. Pervious and impervious soil used as a main ingredient for earthen dam construction. 3. Form many road work soil is used as binder material in between stone and ballast. 4. In retaining wall soil is used as filling material. The type of soil used may vary depending upon its necessity and required parameters. 5. Apart from this soil can be used for other purposes i.e. for river protection work, soil cement mixture for sub grade and also used as a filter material. 6. Soil is used for the construction of canals particularly as filling material. 		
24	State the applications of soils as a construction material.	S-19	4M
Ans	<p>Soil is naturally obtained from disintegration of rocks when they are exposed to atmosphere by weathering agents like sun, wind, rain, frost etc.</p> <p>Applications of Soil :</p> <ol style="list-style-type: none"> 1. Soil is used as construction and foundation material. 2. It is used for making earthen dams, canals, embankments. 3. It is used for making WBM roads. 4. Soil form of clay is used in manufacturing of bricks and tiles. 5. Sand from soil is used in filter bed. 		
26	What are the different types of aggregates ?	S-19	4M
Ans	<p>Aggregate are divided into two categories:</p> <ol style="list-style-type: none"> 1. Coarse Aggregate: The size of aggregate bigger than 4.75mm is considered as Coarse Aggregate. <ul style="list-style-type: none"> a) Crushed stone particles. b) Brick bats c) Slag 2. Fine Aggregate: Aggregate whose sizes is 4.75mm and less is considered as Fine Aggregate. <ul style="list-style-type: none"> a) River sand. b) Sea sand. c) Pit sand d) Artificial crushed stone sand. 		

26	Explain various types of clays with their suitability.	S-18	4M
Ans	<p>Types of clays are:</p> <p>1. Refractory clay (Terra cotta clay): This clay is highly disperse and very plastic. This clay contains high percent of alumina. Uses: Used to manufacturing of refractory bricks, cornices, jambs, sills.</p> <p>2. High melting clay: High melting point clays have high refractoriness @ 15800C. It contains less impurities like quartz, feldspar, mica, CaCO₃ and magnesium carbonate. Uses: Manufacturing of facing bricks, floor tile, sewer pipes.</p> <p>3. Low melting clay: Refractoriness less than 13000C. The composition is not uniform. Uses: Manufacturing of bricks, blocks, tiles.</p> <p>4. Stoneware / Earthenware Clay: Selected clay mixed with ground glass, stone dust, potteries, sand, etc. Uses: Manufacturing of Pipes for drains & sewers.</p> <p>5. Kaolin / China Clay: White color pure clay possessing a high degree of tenacity & plasticity. Uses: Manufacturing of glazed pottery, porcelain.</p>		
27	Explain two properties and two uses of sand.	W-19	4M
Ans	<p>Properties:</p> <p>a) It is a naturally occurring granular material composed of finely divided rock and mineral particles.</p> <p>b) It is obtained by dredging of river, hence harmful for the ecosystem.</p> <p>Uses of sand:</p> <p>a) Commonly used a building material</p> <p>b) It is mixed with cement and water to make concrete</p> <p>c) Manufacture of bricks</p> <p>d) Used in filtration of water</p> <p>e) Used to make casts.</p>		
28	State any four characteristics of good tiles.	S-23	2 M
Ans	<p>Characteristics of good tiles:</p> <ol style="list-style-type: none"> 1) Uniform texture. 2) Accurate size and shape. 3) Free from defects like cracks, impurities, etc. 		

	<p>4) High durability.</p> <p>5) Water absorption less than 15%.</p> <p>6) Resistant to atmosphere and dampness.</p>		
29	State and give function of any four constituents of a good brick earth.	S-23	4M
Ans.	<p>The Good brick earth should contain the following constituents:</p> <ol style="list-style-type: none"> 1. Silica. 2. Alumina. 3. Lime. 4. Iron oxide. 5. Magnesia. <p>Functions of Constituents of Good Brick Earth:</p> <p>1. Silica:</p> <ol style="list-style-type: none"> a) It is responsible for preventing cracking, shrinking and warping of raw bricks. b) It also affects the durability of bricks. c) If present in excess, then it destroys the cohesion between particles and the brick becomes brittle. <p>2. Alumina:</p> <ol style="list-style-type: none"> a) It is responsible for plasticity characteristic of earth, which is important in moulding operation. b) If present in excess, then the raw brick shrink and warp during drying. <p>3. Lime:</p> <ol style="list-style-type: none"> a) It prevents shrinkage of bricks on drying. b) It causes silica in clay to melt on burning and thus helps to bind it. c) Excess of lime causes the brick to melt and brick loses its shape. <p>4. Iron Oxide:</p> <ol style="list-style-type: none"> a) It gives red colour to the bricks. b) It improves impermeability and durability. c) It gives strength and hardness. d) If present in excess, then the colour of brick becomes dark blue or blackish. e) If the quantity of iron oxide is comparatively less, the brick becomes yellowish in colour. <p>5. Magnesia:</p> <ol style="list-style-type: none"> a) Magnesium in brick earth imparts yellow tint to the brick. 		

	<p>b) It is responsible for reducing shrinkage</p> <p>c) Excess of magnesia leads to the decay of bricks.</p> <p>d) Water absorption is increased and the strength is reduced.</p>		
30	State types and any two uses of precast concrete products.	S-23	4M
Ans.	<p>Types of precast concrete products:-</p> <ol style="list-style-type: none"> 1) Hollow concrete blocks. 2) Solid concrete blocks. 3) Pavement blocks. 4) Balustrade. <p>Uses of precast concrete product:-</p> <ol style="list-style-type: none"> 1) For construction of all building components e.g. slab, partition walls, columns, beams etc. 2) For construction of bridge. 3) It can be used architectural concrete accents. 4) It can be used for making traffic barriers and retaining walls. 		
31	State any four types of cement.	W-22	2M
Ans.	<ol style="list-style-type: none"> 1. Ordinary Portland cement (OPC). 2. Portland Pozzolana Cement (PPC). 3. Rapid Hardening Cement. 4. Extra Rapid Hardening Cement. 5. Low Heat Cement. 6. Sulphate Resisting Cement. 7. Quick Setting Cement. 8. Blast Furnace Slag Cement. 9. High Alumina Cement. 10. White Cement. 		
32	Describe in brief types of glass.	W-22	4M
Ans.	<p>1. Silica Glass:</p> <ol style="list-style-type: none"> i. It is the simplest glass composed of silica alone. It is also called quartz glass or vitreous silica has high softening point strain point and annealing point. It has a lower expansion than other glasses a high thermal and chemical resistance. It is extraordinarily transparent to ultra violet radiation. ii. It is used for fibrous glass, rod tubing optical windows, laboratory ware and ultra violet transmitting fillers. 		

2. Soda-Lime-Silica Glass:

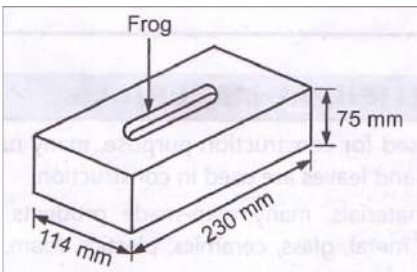
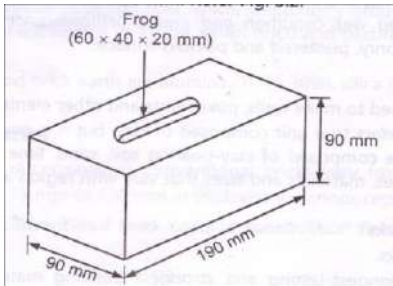
- i. This is the first glass manufactured, Now-a-days; it is called soda-lime-silica, soda-lime or simply lime glass. The raw materials required for this glass are not very costly. This type of glass is relatively easy to melt and fabricate.
- ii. Generally, this glass is/are used when chemical durability and great heat resistance are not required. Window and plate glass, glass blocks, bottles of all kinds, inexpensive table ware, fluorescent and incandescent light bulbs and innumerable other articles are made from lime glass.

3. Lead Glass:

- i. If Lead oxide is added by reducing the percentage of CaO is completely replaced by PDO in lime glass then lead-alkali-silicate glass or flint glass is obtained. This glass is easier to melt and impart good workability.
- ii. The percentage of PDO can be increased up to 80% As the percentage of PbO is increased, the alkali content automatically is reduced.
- iii. If some part of Na₂O is replaced by K₂O, then such a glass will have an exceptional brilliance and lustre.
- iv. It is because of high index of refraction and dispersion Due to these properties lead glass is used for optical systems for the finest tableware and for objects.
- v. These types of glass cuts off X-rays and gamma radiations but are transparent to visible radiation. Hence, these glasses also serve as shielding windows.
- vi. This type glass is used in electric tubes, neon tubing and as a dielectric in capacitors because they are electrically superior most types of borosilicate glass and lime glass.

4. Borosilicate Glass:

- i. In the preparation of this type of glass B₂O₃ is used B₂O₃ is a glass forming material and it also serves as fluxing agent for SiO₂.
- ii. Due to the addition of B₂O₃ the percentage of Na₂O decreases considerably. But still the melting temperature does not increase much. The coefficient of expansion increases by 1/4 to 1/2 compared to lime glasses, due to addition of B₂O₃.
- iii. These glasses produce a greater resistance to thermal shocks. They also have excellent chemical stability and very good electrical characteristics the glass is known as 'Pyrex or Jena Glass.
- iv. It is used for industrial piping cooking utensils and high temperature thermometers, laboratory ware, etc.

	<p>v. It contains 20% or more of Al_2O_3, and the percentage of alkali content is small.</p> <p>vi. It is difficult to melt and fabricate. Its coefficient of expansion is low and chemical durability is excellent.</p> <p>vii. It is used as gauge glass of high pressure steam boilers, combustion tubes and cooking utensils.</p>		
33	List major ingredients of cement.	S-18	2M
Ans.	<p>Major ingredients of cement.</p> <ol style="list-style-type: none"> 1. Lime (CaO) 2. Silica (SiO_2) 3. Alumina (Al_2O_3) 4. Iron oxide (Fe_2O_3) 5. Magnesia (MgO) 6. Gypsum ($CaSO_4 \cdot 2H_2O$) 		
34.	State any two uses of precast concrete blocks.	S-18	2M
Ans.	<p>Uses of precast concrete block.</p> <ol style="list-style-type: none"> 1. In parking areas, footpaths, on road to give pleasant look. 2. Fencing poles for fencing work. 3. It is used for loadbearing masonry, in earthquake zones. 4. Lightweight blocks for partition walls. 		
35.	<ul style="list-style-type: none"> • Draw neat sketches of: <ol style="list-style-type: none"> (ii) Conventional bricks and (iii) Standard bricks showing all the dimensions • Draw neat sketches showing all the dimensions of: <ol style="list-style-type: none"> i) Conventional bricks and ii) Standard bricks 	S-18	4M
		W-19	4M
Ans.	<p>i) Conventional brick.</p>  <p>ii) Standard brick.</p> 		

36.	State any four situations where hollow concrete block masonry is used.	S-18	4M
Ans.	<p>Situations where hollow concrete block masonry is used.</p> <ol style="list-style-type: none"> 1) Hollow concrete blocks are fire resistant and hence are used in masonry where fire resistance is necessary, like furnace, chimney etc. 2) Hollow concrete blocks are light weight. , and hence used in partition walls to reduce dead load of wall. 3) Hollow concrete blocks are having good insulating properties and used in exterior load bearing masonry walls where sound and thermal insulation is essential. It keeps house cool in summer and warm in winter. 4) Hollow concrete blocks are used in compound walls where economic construction is necessary. 5) They are used to achieve uniform quality of masonry, faster construction. 6) They are used to achieve lower labour involvement and greater durability, like Retaining walls. 		
37.	Write any four uses of plywood.	S-18	4M
Ans.	<p>Uses of plywood:</p> <ol style="list-style-type: none"> i) Plywood is used for preparing door panels and shutters of cup boards. ii) It is used for false ceilings for interior designing . iii) For making chairs, tables ,and other kitchen furniture, office cabins iv) For making partitions between two rooms. v) For paneling of walls vi) For railway coaches vii) For formwork for concrete. viii) For packing cases. <p>An</p>		

38.	<p>Suggest the type of cement used for the following :</p> <p>(i) For modular construction where form work needs to be removed early for re-use. (ii) Mass concreting such as construction of dam.</p> <p>(iii) Decorative works in external surfaces of building.</p> <p>(iv) Cementing the oil well.</p>	S-18	4M
Ans.	<p>i) For modular construction where form work needs to be removed early for reuse. – Rapid Hardening Cement</p> <p>ii) Mass concreting such as construction of dam. – Low heat cement.</p> <p>iii) Decorative works in external surfaces of building – Coloured cement.</p> <p>iv) Cementing the oil well. – Oil Well Cement.</p>		
39.	<p>Explain various types of tiles based on their use</p>	S-19	4M
Ans.	<p>1. Natural tile: These types of tiles are produced from natural materials that are quarried, finished and cut to size. Common types of stones used as flooring tiles include granite, marble, limestone and slate.</p> <p>2. Artificial tile: These types of tiles are manufactured by the use of natural materials with various process performed on it. Common types are porcelain, mosaics, ceramic tiles used for flooring and decorative purpose.</p> <p>3. Drain tile: These types of tiles are laid in water logged areas and allow the subsoil water to drain. They may be circular, semi-circular or segmental in shape.</p> <p>4. Floor or paving tiles: These types of tiles are popular in the name of ceramic tiles with various trade names. These tiles have a very attractive look and available in various shade of colour. They have very light weight as compare to mosaic tiles or marble or granite. These tiles are suitable in residential buildings.</p> <p>5. Roof tiles: These tiles are mostly used for covering pitched roof or slope roof. Various types of roof tiles are available in the market in name of Allahabad tiles, corrugated tiles, guna tiles, mangalore tiles, Flemish tiles, flat tiles, pan tiles, pottiles etc.</p> <p>6. Encaustic tiles: Depending upon the addition of coloured pigment in clay, These tiles acquire the desired print or colour after manufacturing. They are famous in the name of galicha tiles.</p>		

40.	Write short note on solid concrete blocks		4M
Ans.	<p>Solid Concrete Blocks:</p> <ol style="list-style-type: none"> 1) The specification and the characteristics of a solid concrete blocks depend on the machine used to manufacture concrete blocks. 2) The most common size of solid concrete block is 300 x 200 x 150 mm. The basic raw material is cement, fine aggregate, coarse aggregate and water taken in appropriate proportion. 3) Mechanical compaction and vibration gives the block high quality in spite of lean mix, which uses very little cement. 4) Solid concrete block is more cost effective as compared to other traditional walling system 5) It has high quality, high strength and uniform size and shape. 6) It is environmental friendly and hence utilizes wastes and local resources. 		
41.	State any two types of glass along with its uses.	W-18	2M
Ans.	<p>Following are the types of Glass and its uses</p> <ol style="list-style-type: none"> 1) Silica Glass : It is used for fibrous glass, rod, tubing, optical windows, laboratory ware and ultra violet transmitting filters. 2) Soda-Lime-Silica Glass : It is used for window and plate glass, glass blocks, bottles of all kinds, inexpensive table wares, fluorescent and incandescent light bulbs and innumerable other articles. 3) Lead Glass : It is used for optical systems, for the finest tableware and for objects. It is also used in electric tubes, neon tubing. 4) Borosilicate Glass : It is used for industrial piping, cooking utensils and high temperature thermometers, laboratory ware 		
42.	State the uses of veneers and Laminated Boards:	W-18	4M
Ans.	<p>Uses of Veneers:</p> <ol style="list-style-type: none"> 1) They are used for making plywood. 2) They are used for making particle boards. 3) They are used for making decorative laminates. 4) They are used for making sunmica and formica. <p>Uses of Laminated boards:</p> <ol style="list-style-type: none"> 1) It is used in kitchen and office furniture. 2) It is used to prepare table tops and door wardrobes. 3) It is used for making false ceiling. 4) It is used for wall cladding. 		

43.	State the advantages and disadvantages of pre-cast concrete.	W-18	4M
Ans.	<p>Advantages of precast concrete products:</p> <ol style="list-style-type: none"> 1. The concrete of superior quality is produced by strict quality control. 2. It is not necessary to provide joints in the pre-cast construction. <p>Disadvantages of precast concrete products:</p> <ol style="list-style-type: none"> 1. If not properly handled, the pre-cast concrete may be damaged during transport. 2. It becomes difficult to produce satisfactory connections between the pre-cast members. 		
44.	Explain various types of Cement and also state the uses.	W-18	4M
Ans.	<p>Following are the various types of cement:</p> <p>1. Ordinary Portland Cement:-</p> <p>This Cement is the basic Portland cement and is used in general for most of the construction work. this cement is used at situations when there is no exposure to Sulphates in the soil or ground water. This is the most common type of cement used for all types of construction works.</p> <p>Uses:</p> <ol style="list-style-type: none"> 1) It is used in important structures, where great strength is required such as heavy buildings and bridges etc. 2) It is used for plastering and painting. 3) It is used for drainage & water supply works. 4) It is used for making cement mortar, plain concrete, reinforced concrete etc. <p>2. White Cement:-</p> <p>White cement can be produce similar to O.P.C. except by restricting the amount of iron oxide by keeping it as low as possible. this can be archived by proper selecting the raw materials like chalk and limestone having low iron and white clay content.</p> <p>Uses:</p> <ol style="list-style-type: none"> 1) It is used for floor finishing. 2) It is used for ornamental works. 3) It is used for plastering. 2) In swimming ponds white cement is used to replace glazed tiles. It is used for fixing marbles and glazed tiles. <p>3. Coloured cement:</p> <p>Coloured cement can be produced by adding color pigments into the ordinary Portland cement. in this type of cement white cement or OPC is used as a base and</p>		

the coloured pigments varying from 2% to 10% depends upon the darkness of the cement added into it.

Uses:

- 1) It is used for finishing of floors.
- 2) It is used for painting.
- 3) It is used for finishing of walls, roofs and window sills.

4.quick setting cement:

This cement is produce by adding a small percentage of aluminum sulphate and by finely grinding the cement. the addition of aluminum sulphate and fineness of grinding are responsible for accelerating the setting action of cement. The setting action of cement starts within five minutes after addition of water and it becomes hard like stone within 30 minutes.

Uses:

- 1) It is used in under water concreting work.
- 2) It is used in repairing as well as maintenance work.

5. Rapid hardening Cement:

The initial and final setting time of this cement is same as ordinary cement. but it attains high strength in early days. It contains high percentage of tricalcium silicate.

Uses:

- 1) It is used when higher strength at early stage is required and formwork is to be removed earlier.
- 2) It is generally used for construction of road pavement so that road can be opened for traffic without delay.
- 3) It is used for manufacturing of precast elements like slab panels, blocks, fencing posts, electric poles etc. So that moulds can be released quickly and reused.
- 4) It also can be used for cold weather concreting to protect concrete from freezing.

This cement should not be used for massive concrete structures like dams, bridge abutments, retaining walls etc. because it evolves much heat.

6.Expanding cement:

This type of cement is produced by adding an expanding medium like sulpho-aluminate and a stabilizing agent to the ordinary cement.

Uses:

It is used for making pre cast products.

45.	Enlist any four types of flooring tiles.	W-19	2M
Ans.	Types of flooring tiles: Shahabad, Kotah, Ceramic, Granite, Marble, Vitrified, Glazed, Plastic tiles ,Concrete tiles, Mosaic tiles, Clay tile.		
46.	Suggest the type of glass used for the following work: i) Making panel of partition wall ii) Cashier Cabin iii) Skylight iv) Door Shutter	W-19	4M
Ans.	i) Making panel of partition wall: Block glass OR Sheet Glass OR chipped and ground glass OR soda lime glass ii) Cashier Cabin-Polished plate glass OR bullet proof glass OR soda lime glass OR laminated glass iii) Skylight: Wired glass OR rolled figured glass OR clear window glass or lead glass iv) Door Shutter: Soda lime glass OR tempered glass		
47.	State the uses (two each) of the following construction materials: i) Soda lime glass ii) Ferrous metal	W-19	4M
Ans.	i) Soda lime glass: a) Used in window and plate glass b) Glass blocks c) Bottles d) Inexpensive table wares e) Fluorescent and incandescent light bulbs ii) Ferrous metal: a) CI (Cast Iron) is used in making rainwater and sanitary pipes b) Wrought iron is used in making nails, wires, chains c) Square bars are used in making grills d) Rolled steel sections are used in making beams, columns and trusses. e) Corrugated sheets are used for roofing known as GI sheets f) Carbon steel is used for making tools g) Weld meshes are used for partition and fencing		

48.	<p>State the two uses of the following construction materials:</p> <p>i) Hollow blocks</p> <p>ii) Pavement blocks</p> <p>i) Hollow Blocks:</p>	W-19	4M
Ans.	<p>a) Used for external load bearing walls,</p> <p>b) Panel walls,</p> <p>c) Columns,</p> <p>d) Retaining Walls</p> <p>e) Compound Walls,</p> <p>f) Used for sound insulation</p> <p>g) It Keeps the house cool in summer and warm in winter</p> <p>h) Load bearing and framed structure.</p> <p>ii) Pavement blocks:</p> <p>a) Used in parking areas</p> <p>b) Footpath, parks</p> <p>c) On roads to give pleasant look</p> <p>d) Petrol pumps</p> <p>e) gardens</p> <p>f) Airports</p> <p>g) Kids play area</p> <p>h) Jogging tracks</p>		

Thank You

<https://shikshamentor.com/building-material-and-construction-sem-ii-msbte-k-scheme/>

Visit

<https://shikshamentor.com/>

