	https://shikshamentor.com/building-material-and-construction-sem-ii-msbte-k-scheme/ 312338 - Building Material and Construction (Sem II) As per MSBTE's K Scheme CE / CR / CS

Unit	Special Purpose Building Construction Materials		Marks - 08
S. N.	MSBTE Board Asked Questions	Exam Year	Marks
1	State properties and classification of damp proofing materials.	S-23	4M
Ans.	**Properties of damp proofing materials:** 1) It should be impervious in nature. 2) It should be strong and durable. 3) Material must be able to withstand dead as well as live load without damages. 4) It should be dimensionally stable. 5) It should be free from deliquescent salts like sulphates, chlorides and nitrates. 6) It should be water proof. 7) It should withstand temperature variations and prevent formation of cracks. 8) It should get easily mixed with cement, sand and aggregates to form a homogeneous paste. **Classification of damp proofing materials:** 1) Flexible materials a. Materials like bitumen, plastic sheeting. 2) Semi rigid materials a. Materials like asphalts. 3) Rigid Materials: a. Materials like first class brick, stone etc.		

2	**State any two properties and situations where sound insulating material is used.**	**S-23**	**4M**
Ans.	**Properties of sound insulating materials:** **1) It should be light in weight.** **2) Easy to handle and fix.** **3) It should be resistant to attack termite and insect.** **4) It should have low density and porous texture.** **5) It should be fire resistance.** **6) It should be moisture resistance.** **Situations where sound insulating material is used:** **1) In Porous materials with a solid skeleton, sound is absorbed as a result of viscous friction inside the porous. Light weight concrete with porous aggregate, foam glass, mineral wool, glass wool in the form of strips, slabs, roll, mats and strips are suitable materials used in various constructions underneath the floor.** **2) Porous jagged structures, based on plastics, rubber are available in the form of strips and liners. They provide sound proofing of reinforced concrete floors.** **3) Loose composition, like artificial and natural sand, slag is used as fillers.** **4) Panel material like veneer panel, rigid wood fiber board, are suitable for interior finishing of buildings to improve acoustic properties by dampening noises.** **5) Baffle materials which includes, thin panels from veneer, solid card board are suitable for facing suspended ceilings to insulate noise.** **6) Acoustic tiles and acoustic plaster are suitable where absorption of sound required from tile to tile should be uniform.**		
3	• **Enlist properties of thermal insulating materials.** • **State the Properties of thermal insulating materials.**	**S-23** **W-18**	**4M**
Ans	**Properties of thermal insulating materials:** **1) It should be fire proof.** **2) It should not absorb moisture.** **3) It should be easy to handle.** **4) It should be chemical proof.** **5) It should be bio resistant and dry.** **6) Bulk density should be below 600kg/m3.**		

4	Explain the method by which water proofing of existing old slab can be done.	S-23	4M
Ans.	**Surface preparation:** The surface preparation is the key to any of the treatment process, as it shall create a strong foundation for any waterproofing systems to last longer than life expectancy. The surface preparation needs to be in the following ways: **i) Cleaning / Washing:** Clearing with a brush or washing with pressure washer shall remove all the impurities like oil or grease, loosely adhered particles and weaken or decomposed algae/fungus which might have accumulated on the surface because of weathering. Caution: Upon cleaning with flowing water or pressure wash, adequate drying of the substrate is mandatory. If the surface remains wet, the adhesion of primer may not remain the same. **ii) Repair or Strengthening of Weaken Substrate:** The loosen concrete or plaster to be removed and re-plastered or re-concreting is required. Once done, the same needs curing for a sufficient period. Remember: General curing period what we recommend is of at least 3 days. If the surface is tiled or is with china mosaic chip then the hollow tiling part has to be treated first. Moving forward this surface to be cleaned to remove any dirt or foreign particle left. The surface needs a strong investigation for any presence of the crack. **iii) Sealing the Outlets and Projections:** Every flat roof shall have an outlet for the rainwater or overflow water to drain down off the roof. Likewise, there's plumbing projection with air-release & sewage projection with gas-release for any roof. A few of the roofs also have the columns/pillar for the overhead water tank or a platform for the lift room access. The joints between the surface and floor require to be sealed. Ensure that there's no void or opening for water to enter through it. **iv) Apply Primer:** The primer act as the bonding agent between the coating and the surface which ensures the better adhesion along with an increase in the coating's durability and also helps with additional protection to the surface. **v) Apply Base Coat:**		

	Application of Base Coat is the primary, important and critical part of any coating. Base Coat straightly affects the performance & functionality of the coating system. Waterproofing Base Coat creates a foundation for the coating to absorb the movement shocks which may be caused either by the surface or because of any external movement. This kind of step also includes creating a coving at the junction of walls and floor. **vi) Apply Intermediate Coat:** **Intermediate coats have different purposes like insulation, isolation of the system or even adding the additional protection level to the coating system.** **vii) Apply Topcoat:** **As the name suggests, it's a top-level of the system. It comes with the many properties like Anti Abrasive, UV stable, Anti Static, Solar Reflective and Emitive and aesthetically pleasant.**		
5	**Define fibers and state any two applications of asbestos fibers.**	**W-22**	**4M**
Ans	**Fibers:-** **The fiber is a filament or thread like piece of any material.** **Applications of asbestos fibers:** **1. For manufacturing the roofing sheet used with cement.** **2. Used to make pipe (rainwater pipe).** **3. Used to make damp proof course material by mixing with bitumen to prepare felts.** **4. It is used to form asbestos paint.** **5. It is used for thermal insulation work for pipe line.** **6. Used in electrical insulation work.**		
6	**State any four properties of Geo-cement.**	**W-22**	**4M**
Ans	**Properties:** **1. It gains ultimate strength within 24 hours and cures more rapidly than OPC.** **2. It has an ability to form strong chemical bond with all types of reagents and water.** **3. It is manufacture from industrial waste like fly ash.** **4. It is environmental friendly green product.** **5. It has fire and heat resistance.**		

	6. It is highly resistant to acids, toxic wastes and salt waters. 7. There is no CO2 emission.		
7	State the suitability of various types of sound insulating materials.	W-22	4M
Ans	**Suitability of sound insulating materials:** 1. In Porous materials with a solid skeleton, sound is absorbed as a result of viscous friction inside the porous. Light weight concrete with porous aggregate, foam glass, mineral wool, glass wool in the form of strips, slabs, roll, mats and strips are suitable materials used in various constructions underneath the floor. 2. Porous jagged structures, based on plastics, rubber are available in the form of strips and liners. They provide sound proofing of reinforced concrete floors. 3. Loose composition, like artificial and natural sand, slag is used as fillers. 4. Panel material like veneer panel, rigid wood fiber board, are suitable for interior finishing of buildings to improve acoustic properties by dampening noises. 5. Baffle materials which includes, thin panels from veneer, solid card board are suitable for facing suspended ceilings to insulate noise. 6. Acoustic tiles and acoustic plaster are suitable where absorption of sound required from tile to tile should be uniform.		
8	State suitability of: (i) Water proofing materials and (ii) (ii) Sound insulating materials	S-18	4M
Ans	**i) Suitability of water proofing materials:** 1. Concrete, Bricks, Stones, plaster have tendency to get deteriorate, hence leakage of water may occur in slab, beam, columns. Bitumen and tars are used for water proof coatings for making surfaces hydrophobic, for priming surfaces. 2. Fibre glass water proofing material is a roll water proofing material suitable for roofs and slabs. 3. Sealing water proof material are used for filling exterior joints in buildings and installations 4. Prefabricated water proofing concrete items are suitable for anti-corrosion		

waterproofing of installations

5. Water proofing asphalt slabs are suitable for the waterproofing work and filling of deformation joints.

6. Paints are suitable for the waterproofing of external walls where cracks are developed.

7. Plastics waterproofing membranes in the form of sheets prevent water penetration into pores and voids in structures.

8. Water proofing chemicals in liquid or powder form like zinc sulphate, alkaline silicates calcium chloride are added to concrete to improve resistance to water absorption.

9. Water repellents like soda, potash, calcium soaps, and waxes are suitable for pore blocking.

ii) Suitability of sound insulating materials:

1) In Porous materials with a solid skeleton, sound is absorbed as a result of viscous

friction inside the pours. Light weight concrete with porous aggregate, foam glass, mineral wool, glass wool in the form of strips, slabs, roll, mats are suitablematerials used in various constructions underneath the floor.

2) Porous jagged structures, based on plastics, rubber are available in the form of strips and liners. They provide sound proofing of reinforced concrete floors.

3) Loose composition, like artificial and natural sand, slag is used as fillers.

4) Panel material like veneer panel, rigid wood fibre board, are suitable for interior finishing of buildings to improve acoustic properties by dampening noises.

5) Baffle materials which includes, thin panels from veneer, solid card board are suitable for facing suspended ceilings to insulate noise.

6) Acoustic tiles and acoustic plaster are suitable where absorption of sound is required.

9	**State situations where sound insulating and damp proofing materials are used.**	**S-18**	**4M**
Ans	**Situations where sound insulating materials are used:** **1) Glass, mineral wool mats, are used as sound insulators as solid inner layers underneath floors.** **2) Wood fibre and asbestos cement slabs are used as strip lining in floors.** **3) Plastic slabs are used for sound proofing of RCC floors.** **4) Wood fibre board is used as sub floors to insulate impact noise.** **5) Mineral wood boards are used in special chambers.** **6) Gypsum plaster boards are used for facing walls and ceilings** **7) Perforated plywood is usually suspended from trusses, so as to provide air space.** **8) Asbestos cement acoustic baffles are used for facing suspended ceilings or walls to insulate noise.** **9) Acoustical tiles are used where uniform sound absorption is necessary.** **10) Acoustic plaster made by mixing cement and granular insulating material is used on walls to make wall and room sound proof.** **Situations where Damp proofing materials are used:** **1) Damp proof course of Concrete with damp proofing chemicals is used over masonry at foundation and plinth to prevent dampness.** **2) Damp proof course of concrete with chemicals is used below flooring of marble, granite.** **3) Damp proofing materials are used on external side of walls to prevent dampness.** **4) Damp proofing materials are used in toilet fl** **oors of upper story, so that no dampness will occur in slab below that floor.**		

10	**State the applications of geo-polymer cement.**	**S-18**	**4M**
Ans	**Application of geo polymer cement:** **1) It is used in geo-polymer concrete, as a substitute for ordinary Portland cement.** **2) It is used in transportation like roads, Bridges, embankment etc.** **3) It is used in construction of building components.** **4) It is used in manufacturing of pavement blocks.** **5) Geo-polymer cement has off shore application also.**		
11	**What are the properties of sound insulating materials?**	**S-19**	**4M**
Ans.	**Properties of sound insulating materials:** **1. It should be light in weight** **2. Easy to handle and fix** **3. It should be resistant to attack termite and insect** **4. It should have low density and porous texture** **5. It should be fire resistance** **6. It should be moisture resistance**		
12	**List the materials used for water proofing**	**S-19**	**2M**
Ans.	**.** **Following materials are used for water proofing...** **Water proofing materials based on bitumen and tar binders are** **1) Emulsions and pastes** **2) Mastics.... Hot and Cold Mastics** **Bitumen , Rubber bitumen, Tar and Petroleum Asphalt.** **3) Roll and Sheet Material** **i) Coated impregnated roll materials** **ii) Non Coated impregnated cardboard rolled materials** **4) Sealing materials**		

13	**Enlist the different sound insulating materials and also state their suitability.**	**W-18**	**4M**
Ans	**Different sound insulating materials:** **1) Asbestos , 2) rock wool , 3)glass ,4)silk, 5)Han felt** **6) Mineral wool boards, 7)cane fibers. 8) Acoustical plaster boards and tiles 9)Corkoustics 10) Celotex building boards.11) Glass fibers.** **Suitability of sound insulating materials.** **1) In Porous materials with a solid skeleton, sound is absorbed as a result of viscous friction inside the porous. Light weight concrete with porous aggregate, foam glass, mineral wool, glass wool in the form of strips, slabs, roll, mats and strips are suitable materials used in various constructions underneath the floor.** **2) Porous jagged structures, based on plastics, rubber are available in the form of strips and liners. They provide sound proofing of reinforced concrete floors.** **3) Loose composition, like artificial and natural sand, slag is used as fillers.** **4) Panel material like veneer panel, rigid wood fibre board, are suitable for interior finishing of buildings to improve acoustic properties by dampening noises.** **5) Baffle materials which includes, thin panels from veneer, solid card board are suitable for facing suspended ceilings to insulate noise.** **6) Acoustic tiles and acoustic plaster are suitable where absorption of sound required from tile to tile should be uniform.**		
14	**Describe in brief termite proofing.**	**W-18**	**4M**
Ans.	**Termite proofing:** **1) In building construction, wooden materials are used for doors, window frames, furniture, electric boxes etc. These have tendency to be attacked by termites or white ants and make holes under the moist conditions, Hence to protect wooden items from such attack is known as termite proofing.** **2) Dry wood termites make their houses in wood in the form of tubes and damage the wooden articles.** **3) Subterranean termites live in soil in favorable conditions and damage building parts by building nest in the form of colonies. Their growth is very fast and special treatment is required to protect the building parts.** **4) To save wooden and building parts from attack of termites, anti-termite materials are available in the market like, DDT, BHC, Aldrin , Heptachlor, Chlordane etc.**		

	5) If there is a growth of termite in the soil below building, then the holes are made around the building and then termite proof chemicals are put into those holes.		
15	Explain the method by which waterproofing of existing old slab can be done.	W-19	4M
Ans	i) Clean the slab ii) Expose cracks by tools and make them 'V' shaped. iii) Fill mix of cement mortar iv) Fill brick bats and sand over the slab v) Sprinkle cement slurry and paste of water proofing chemical or compound and cure it for 3 days. vi) Fix china chip tiles over the layer of cement mortar 1:3 vii) Cure it for 3 days and slab is water proof.		
16	State various thermal insulating materials. State any two properties of insulating material	W-19	4M
Ans.	Thermal insulating materials: 1) Asbestos 2) Aluminum Foil 3) Thermocol 4) Saw dust 5) Cork board slabs 6) Foam glass 7) Rock Wool 8) Glass Wool 9) Concrete Block 10) Flexible Blankets		

	11) Gypsum Boards **Properties:** **a) It should be fire proof** **b) It should not absorb moisture** **c) It should be easy to handle** **d) It should be chemical proof.** **e) It should be bio resistant and dry** **f) Bulk density should be below 600kg/m3** **g) Pores: Most of the common insulating materials are porous in structure.** **The entrapped air or any other gas within the pores decreases the thermal conductivity of the material.** **h) Presence of Moisture: with the increase in moisture content, the coefficient** **of thermal conductivity rises greatly**		
17	**State important properties and uses of geopolymer cement**	**W-19**	**4M**
19	**Properties:** **a) It gain ultimate strength within 24 hours and cures more rapidly than OPC.** **b) It has an ability to form strong chemical bond with all types of reagents and water.** **c)It is manufacture from industrial waste like fly ash** **d)It is environmental friendly green product** **e) It has fire and heat resistance** **f) It is highly resistant to acids, toxic wastes and salt waters.** **g) There is no CO2 emission.** **Uses:**		

	a) It is being developed and used as an alternative to OPC **b) It can be used with any type of rock based aggregates, since it forms a strong bond** **c) Used in Construction of structure in sea water** **d) Partial replacement with OPC (80-90%), reduces CO2 emission** **e) Since it is highly resistant to acids and chemicals, it is used in construction chemical industry and laboratory** **f) It is more effective in the construction of transportation infrastructure** **g) It protects aquifers and surface bodies of fresh water via the elimination of fly-ash disposal sites.** **h) Various applications in building industry**

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