CENTRAL POLYTECHNIC COLLEGE, THARAMANI-600 113.
(An Autonomous Institution)

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

ECE31020 – CONSTRUCTION MATERIALS

ECE31020	Construction Materials	L	T	P	C
Theory		3	0	0	3

UnitI	Construction Materials and Properties	
	1.1 **Introduction** History of building materials-Conventional building materials-New and advanced materials -Eco friendly and green construction materials(Definition and any five materials)- Energy efficient and sustainable building materials(Definition and any five materials). **1.2 Properties of construction Materials** Density-Specific gravity - Porosity-Water absorption – Permeability - Chemical resistance-weathering resistance-Fire resistance-Thermal conductivity-Thermal expansion-sustainability to freezing and thawing - Durability-Factors affecting durability of building materials. **1.3. Aggregates** Classification of aggregates -Natural aggregates -Artificial aggregates - Light weight aggregates-Heavy weight aggregates-Recycling of aggregates. **1.4. Water** Requirements of water used in construction works-Effects of presence Sulphates and chlorides in water-Permissible limits of deleterious materials as per Indian standard, IS456:2000.	9
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1	1	Which of the following is a conventional building material? (a) Glass fiber reinforced concrete (b) Steel (c) Bamboo (d) Fly ash bricks **Ans:Steel**
1	2	What is a characteristic of a "new and advanced material"? (a) They are widely available and cheap (b) They have enhanced performance and unique properties (c) They are harmful to the environment (d) They are difficult to manufacture **Ans:They have enhanced performance and unique properties**
1	3	What is a key feature of an "eco-friendly and green construction material"? (a) They have a high embodied energy (b) They are non-recyclable (c) They have a low environmental impact throughout their life cycle (d) They are expensive and difficult to use **Ans:They have a low environmental impact throughout their life cycle**
1	4	Which of the following is an example of an eco-friendly material? (a) Cement (b) Bamboo (c) Steel (d) Plastic **Ans:Bamboo**
1	5	"Energy efficient and sustainable building materials" are primarily designed to... (a) Increase the energy consumption of a building (b) Reduce the energy consumption of a building (c) Have a high embodied energy (d) Be difficult to recycle **Ans:Reduce the energy consumption of a building**
1	6	Which of the following is an example of an energy-efficient material? (a) Concrete (b) Insulated glass (c) Wood (d) Steel **Ans:Insulated glass**
1	7	What does "Density" of a material refer to? (a) The mass per unit volume (b) The weight per unit area (c) The strength of the material (d) The durability of the material **Ans:The mass per unit volume**
1	8	"Specific gravity" is the ratio of the density of a substance to the density of... (a) Water at 4°C (b) Air at 0°C (c) Sand at 25°C (d) Concrete **Ans:Water at 4°C**

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1	10	"Water absorption" of a material is defined as... (a) The ability to resist water (b) The increase in weight of a material due to absorption of water (c) The ability to absorb water (d) The amount of water that can be absorbed **Ans:The increase in weight of a material due to absorption of water**
1	11	What is "Permeability" of a material? (a) The ability to resist the flow of a fluid (b) The ability to allow the flow of a fluid through it (c) The ability to absorb water (d) The ability to absorb heat **Ans:The ability to allow the flow of a fluid through it**
1	12	"Chemical resistance" of a material is its ability to... (a) React with chemicals (b) Resist the effects of chemical attack (c) Absorb chemicals (d) Dissolve in chemicals **Ans:Resist the effects of chemical attack**
1	13	What is "Weathering resistance"? (a) The ability of a material to withstand the effects of weather (b) The ability of a material to absorb water (c) The ability of a material to resist fire (d) The ability of a material to absorb heat **Ans:The ability of a material to withstand the effects of weather**
1	14	"Fire resistance" of a material is its ability to... (a) Burn easily (b) Resist burning and deformation under high temperature (c) Absorb heat (d) Melt easily **Ans:Resist burning and deformation under high temperature**
1	15	What is "Thermal conductivity" of a material? (a) The ability to absorb heat (b) The ability to transfer heat (c) The ability to resist heat transfer (d) The ability to expand when heated **Ans:The ability to transfer heat**
1	16	"Thermal expansion" of a material is its ability to... (a) Contract when heated (b) Expand when heated (c) Absorb heat (d) Absorb cold **Ans:Expand when heated**
1	17	What is "Durability" of a material? (a) The ability to resist fire (b) The ability to resist water (c) The ability to withstand weathering and wear over time (d) The ability to resist chemicals **Ans:The ability to withstand weathering and wear over time**

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1	19	What is a "Natural aggregate"? (a) An aggregate produced by crushing rock (b) An aggregate found in nature, such as sand and gravel (c) An aggregate produced by recycling materials (d) An aggregate produced by a chemical reaction **Ans:An aggregate found in nature, such as sand and gravel**
1	20	What is an "Artificial aggregate"? (a) An aggregate found in nature (b) An aggregate produced by crushing rock (c) An aggregate produced by a chemical process, such as fly ash (d) An aggregate produced by recycling materials **Ans:An aggregate produced by a chemical process, such as fly ash**
1	21	"Light weight aggregates" are used to produce... (a) High strength concrete (b) Light weight concrete (c) Heavy weight concrete (d) Low strength concrete **Ans:Light weight concrete**
1	22	"Heavy weight aggregates" are used to produce... (a) High strength concrete (b) Light weight concrete (c) Heavy weight concrete for radiation shielding (d) Low strength concrete **Ans:Heavy weight concrete for radiation shielding**
1	23	"Recycling of aggregates" is an important aspect of... (a) Conventional construction (b) Sustainable construction (c) Chemical construction (d) All of the above **Ans:Sustainable construction**
1	24	What is a key requirement of water used in construction works? (a) It should be salty (b) It should be free from oils, acids, and other harmful substances (c) It should be black in color (d) It should be a lot of water **Ans:It should be free from oils, acids, and other harmful substances**
1	25	The presence of sulphates in water used for construction can lead to... (a) An increase in concrete strength (b) The corrosion of steel reinforcement (c) The production of a strong concrete (d) A decrease in the cost of construction **Ans:The corrosion of steel reinforcement**
1	26	The presence of chlorides in water used for construction can lead to... (a) An increase in concrete strength (b) The corrosion of steel reinforcement (c) The production of a strong concrete (d) A decrease in the cost of construction **Ans:The corrosion of steel reinforcement**

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1	28	What is the maximum permissible limit of sulphates in water as per IS456:2000? (a) 200 mg/L (b) 400 mg/L (c) 500 mg/L (d) 1000 mg/L **Ans:400 mg/L**
1	29	What is the maximum permissible limit of chlorides in water for plain concrete as per IS456:2000? (a) 500 mg/L (b) 1000 mg/L (c) 2000 mg/L (d) 5000 mg/L **Ans:2000 mg/L**
1	30	What is the maximum permissible limit of chlorides in water for reinforced concrete as per IS456:2000? (a) 500 mg/L (b) 1000 mg/L (c) 2000 mg/L (d) 5000 mg/L **Ans:500 mg/L**
1	31	A concrete mix uses 250 kg of cement per cubic meter. If the water-cement ratio is 0.45, what is the required amount of water? (a) 100 L (b) 112.5 L (c) 125 L (d) 150 L **Ans:112.5 L**
1	32	A concrete mix uses 300 kg of cement per cubic meter. If the water-cement ratio is 0.5, what is the required amount of water? (a) 100 L (b) 125 L (c) 150 L (d) 175 L **Ans:150 L**
1	33	A concrete cube has a mass of 5.5 kg and a volume of 2750 cm^3. What is the density of the concrete? (a) 2000 kg/m^3 (b) 2250 kg/m^3 (c) 2500 kg/m^3 (d) 2750 kg/m^3 **Ans:2000 kg/m^3**
1	34	A sample of aggregate weighs 100 kg. After immersion in water, the weight is 110 kg. What is the water absorption? (a) 5% (b) 10% (c) 15% (d) 20% **Ans:0.1**
1	35	A concrete specimen has a weight of 6 kg in air and 3.5 kg in water. What is the specific gravity? (a) 1.8 (b) 2 (c) 2.4 (d) 2.6 **Ans:2.4**

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1	37	A concrete specimen has a weight of 8 kg in air and 4.5 kg in water. What is the specific gravity? (a) 1.8 (b) 2 (c) 2.2 (d) 2.4 **Ans:2.2**
1	38	A concrete mix uses 350 kg of cement per cubic meter. If the water-cement ratio is 0.4, what is the required amount of water? (a) 100 L (b) 125 L (c) 140 L (d) 160 L **Ans:140 L**
1	39	A concrete cube has a mass of 6.5 kg and a volume of 3250 cm^3. What is the density of the concrete? (a) 2000 kg/m^3 (b) 2250 kg/m^3 (c) 2500 kg/m^3 (d) 2750 kg/m^3 **Ans:2000 kg/m^3**
1	40	A sample of aggregate weighs 150 kg. After immersion in water, the weight is 165 kg. What is the water absorption? (a) 5% (b) 10% (c) 15% (d) 20% **Ans:0.1**
1	41	A concrete specimen has a weight of 10 kg in air and 6 kg in water. What is the specific gravity? (a) 2 (b) 2.2 (c) 2.5 (d) 2.8 **Ans:2.5**
1	42	A concrete mix uses 400 kg of cement per cubic meter. If the water-cement ratio is 0.35, what is the required amount of water? (a) 100 L (b) 125 L (c) 140 L (d) 160 L **Ans:140 L**
1	43	A concrete cube has a mass of 7.5 kg and a volume of 3750 cm^3. What is the density of the concrete? (a) 2000 kg/m^3 (b) 2250 kg/m^3 (c) 2500 kg/m^3 (d) 2750 kg/m^3 **Ans:2000 kg/m^3**
1	44	A sample of aggregate weighs 180 kg. After immersion in water, the weight is 198 kg. What is the water absorption? (a) 5% (b) 10% (c) 15% (d) 20% **Ans:0.1**

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1	46	A concrete mix uses 450 kg of cement per cubic meter. If the water-cement ratio is 0.4, what is the required amount of water? (a) 150 L (b) 160 L (c) 180 L (d) 200 L **Ans:180 L**
1	47	A concrete cube has a mass of 8.5 kg and a volume of 4250 cm^3. What is the density of the concrete? (a) 2000 kg/m^3 (b) 2250 kg/m^3 (c) 2500 kg/m^3 (d) 2750 kg/m^3 **Ans:2000 kg/m^3**
1	48	A sample of aggregate weighs 200 kg. After immersion in water, the weight is 220 kg. What is the water absorption? (a) 5% (b) 10% (c) 15% (d) 20% **Ans:0.1**
1	49	A concrete specimen has a weight of 15 kg in air and 9 kg in water. What is the specific gravity? (a) 2 (b) 2.2 (c) 2.5 (d) 2.8 **Ans:2.5**
1	50	A concrete mix uses 500 kg of cement per cubic meter. If the water-cement ratio is 0.3, what is the required amount of water? (a) 100 L (b) 125 L (c) 150 L (d) 175 L **Ans:150 L**
2	1	What is the main component of good brick earth? (a) Sand (b) Alumina (c) Lime (d) Iron oxide **Ans:Alumina**
2	2	What is a characteristic of a First Class brick as per BIS? (a) Compressive strength of less than 3.5 N/mm^2 (b) Water absorption of less than 20% (c) Water absorption of less than 15% (d) Compressive strength of more than 10.5 N/mm^2 **Ans:Water absorption of less than 15%**
2	3	What is the minimum compressive strength for a First Class brick as per BIS? (a) 3.5 N/mm^2 (b) 5.0 N/mm^2 (c) 7.5 N/mm^2 (d) 10.5 N/mm^2 **Ans:10.5 N/mm^2**

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2	5	"Special types of brick" are used for... (a) General purpose masonry (b) Decorative and specific structural purposes (c) Only for load-bearing walls (d) Only for non-load-bearing walls **Ans:Decorative and specific structural purposes**
2	6	Which of the following is an example of a "special type of brick"? (a) Burnt clay brick (b) Solid brick (c) Engineering brick (d) Hollow brick **Ans:Engineering brick**
2	7	"Fly ash bricks" are a type of masonry block made from... (a) Burnt clay (b) Cement and fly ash (c) Sand and cement (d) Concrete **Ans:Cement and fly ash**
2	8	What is a key characteristic of "Solid blocks"? (a) They are hollow in the center (b) They have high thermal insulation (c) They are dense and heavy (d) They are light in weight **Ans:They are dense and heavy**
2	9	"Hollow blocks" are characterized by... (a) Their high compressive strength (b) Their voids, which reduce weight and provide insulation (c) Their high density (d) Their high water absorption **Ans:Their voids, which reduce weight and provide insulation**
2	10	"AAC blocks" (Autoclaved Aerated Concrete) are known for their... (a) High density and weight (b) High thermal insulation and low weight (c) High compressive strength (d) High water absorption **Ans:High thermal insulation and low weight**
2	11	"Earthenware" is a type of ceramic product known for its... (a) High strength and non-porosity (b) Porous nature and low firing temperature (c) High firing temperature and high strength (d) High fire resistance **Ans:Porous nature and low firing temperature**
2	12	"Stoneware" is a type of ceramic product known for its... (a) Porous nature (b) High porosity (c) Vitreous and non-porous nature (d) Low compressive strength **Ans:Vitreous and non-porous nature**

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2	14	"Ceramic tiles" are used for... (a) Masonry construction (b) Flooring and wall cladding (c) Roofing (d) All of the above **Ans:Flooring and wall cladding**
2	15	"Glazed tiles" are characterized by... (a) A porous surface (b) A non-porous and shiny surface (c) A rough surface (d) A high compressive strength **Ans:A non-porous and shiny surface**
2	16	What are "Roof tiles" primarily used for? (a) Wall cladding (b) Flooring (c) Covering roofs (d) Decorative purposes **Ans:Covering roofs**
2	17	"Thermal care tiles" are designed to... (a) Absorb heat and keep a building cool (b) Reflect heat and keep a building cool (c) Transfer heat into a building (d) Have a low thermal conductivity **Ans:Reflect heat and keep a building cool**
2	18	What is the main "constituent of glass"? (a) Sand (Silica) (b) Lime (c) Soda (d) Alumina **Ans:Sand (Silica)**
2	19	"Classification of glass" can be based on... (a) Its composition (b) Its properties (c) Its use (d) All of the above **Ans:All of the above**
2	20	What is a "laminated glass"? (a) A single sheet of glass (b) Two or more sheets of glass bonded together with a plastic layer (c) A type of glass used for windows (d) A type of glass used for mirrors **Ans:Two or more sheets of glass bonded together with a plastic layer**
2	21	The "size and thickness" of glass is an important factor for... (a) Its weight (b) Its fire resistance (c) Its strength and application (d) Its color **Ans:Its strength and application**

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2	23	"Porcelain" is a type of ceramic product used for... (a) Masonry (b) Electrical insulators and sanitary ware (c) Roofing (d) Flooring **Ans:Electrical insulators and sanitary ware**
2	24	The "compressive strength" of a brick is its ability to... (a) Resist tensile forces (b) Resist compressive forces (c) Resist shear forces (d) Resist bending forces **Ans:Resist compressive forces**
2	25	"AAC blocks" are a type of masonry block made from... (a) Cement, fly ash, and aggregates (b) Lime, cement, and an expansion agent (c) Sand, cement, and water (d) Clay **Ans:Lime, cement, and an expansion agent**
2	26	A brick has a compressive strength of 12.5 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:First Class**
2	27	A brick has a water absorption of 18% by weight. What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Second Class**
2	28	A solid block has a compressive strength of 15 N/mm². Is it suitable for a load-bearing wall? (a) Yes (b) No (c) Cannot be determined (d) Only for non-load-bearing walls **Ans:Yes**
2	29	A hollow block has a void area of 40% of its total area. What is its use? (a) For high-strength walls (b) For thermal insulation and non-load-bearing walls (c) For load-bearing walls (d) For foundations **Ans:For thermal insulation and non-load-bearing walls**
2	30	A brick has a compressive strength of 8.0 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Second Class**

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2	32	A solid block has a compressive strength of 20 N/mm². Is it suitable for a load-bearing wall? (a) Yes (b) No (c) Cannot be determined (d) Only for non-load-bearing walls **Ans:Yes**
2	33	A hollow block has a void area of 50% of its total area. What is its use? (a) For high-strength walls (b) For thermal insulation and non-load-bearing walls (c) For load-bearing walls (d) For foundations **Ans:For thermal insulation and non-load-bearing walls**
2	34	A brick has a compressive strength of 6.0 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Third Class**
2	35	A brick has a water absorption of 14% by weight. What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:First Class**
2	36	A solid block has a compressive strength of 10 N/mm². Is it suitable for a load-bearing wall? (a) Yes (b) No (c) Cannot be determined (d) Only for non-load-bearing walls **Ans:Yes**
2	37	A hollow block has a void area of 30% of its total area. What is its use? (a) For high-strength walls (b) For thermal insulation and non-load-bearing walls (c) For load-bearing walls (d) For foundations **Ans:For thermal insulation and non-load-bearing walls**
2	38	A brick has a compressive strength of 9.5 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Second Class**
2	39	A brick has a water absorption of 19% by weight. What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Second Class**

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2	41	A hollow block has a void area of 60% of its total area. What is its use? (a) For high-strength walls (b) For thermal insulation and non-load-bearing walls (c) For load-bearing walls (d) For foundations **Ans:For thermal insulation and non-load-bearing walls**
2	42	A brick has a compressive strength of 11.0 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:First Class**
2	43	A brick has a water absorption of 23% by weight. What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Third Class**
2	44	A solid block has a compressive strength of 18 N/mm². Is it suitable for a load-bearing wall? (a) Yes (b) No (c) Cannot be determined (d) Only for non-load-bearing walls **Ans:Yes**
2	45	A hollow block has a void area of 35% of its total area. What is its use? (a) For high-strength walls (b) For thermal insulation and non-load-bearing walls (c) For load-bearing walls (d) For foundations **Ans:For thermal insulation and non-load-bearing walls**
2	46	A brick has a compressive strength of 7.0 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Third Class**
2	47	A brick has a water absorption of 16% by weight. What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:Second Class**
2	48	A solid block has a compressive strength of 12 N/mm². Is it suitable for a load-bearing wall? (a) Yes (b) No (c) Cannot be determined (d) Only for non-load-bearing walls **Ans:Yes**

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2	50	A brick has a compressive strength of 13.0 N/mm². What is its grade as per BIS? (a) First Class (b) Second Class (c) Third Class (d) Not classified **Ans:First Class**
3	1	What is the main component of Ordinary Portland Cement (OPC)? (a) Lime (b) Silica (c) Alumina (d) Iron oxide **Ans:Lime**
3	2	"Portland Pozzolanic Cement" is a type of cement that contains... (a) Only OPC (b) OPC and a Pozzolanic material (c) Only Pozzolanic material (d) OPC and sand **Ans:OPC and a Pozzolanic material**
3	3	"Grades of cement" are based on... (a) Its color (b) Its setting time (c) Its compressive strength (d) Its fineness **Ans:Its compressive strength**
3	4	What is the minimum compressive strength for a 53 Grade OPC after 28 days? (a) 33 MPa (b) 43 MPa (c) 53 MPa (d) 63 MPa **Ans:53 MPa**
3	5	"Water-cement ratio" is defined as... (a) The weight of water to the weight of cement (b) The volume of water to the volume of cement (c) The weight of cement to the weight of water (d) The volume of cement to the volume of water **Ans:The weight of water to the weight of cement**
3	6	"Hydration of cement" is... (a) The process of adding water to cement (b) The chemical reaction between cement and water (c) The drying of cement (d) The setting of cement **Ans:The chemical reaction between cement and water**
3	7	"Setting of cement" refers to... (a) The hardening of the cement paste (b) The initial stiffening of the cement paste (c) The final stiffening of the cement paste (d) All of the above **Ans:All of the above**

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3	9	"Pozzolanic materials" are substances that react with... (a) Water to form a cementitious compound (b) Lime in the presence of water to form a cementitious compound (c) Cement to form a strong bond (d) Aggregates to form a strong bond **Ans:Lime in the presence of water to form a cementitious compound**
3	10	"Fly ash" is a type of pozzolanic material obtained from... (a) Volcanic ash (b) The combustion of pulverized coal in thermal power plants (c) The production of steel (d) The mining of limestone **Ans:The combustion of pulverized coal in thermal power plants**
3	11	"Ground Granulated Blast Furnace Slag" (GGBS) is a pozzolanic material obtained from... (a) The production of cement (b) The production of iron and steel (c) The production of lime (d) The combustion of coal **Ans:The production of iron and steel**
3	12	"Silica fume" is a pozzolanic material obtained as a by-product of... (a) The production of cement (b) The production of steel (c) The production of silicon and ferrosilicon alloys (d) The production of lime **Ans:The production of silicon and ferrosilicon alloys**
3	13	"Natural Pozzolans" are naturally occurring materials like... (a) Fly ash (b) Volcanic ash and pumicites (c) GGBS (d) Silica fume **Ans:Volcanic ash and pumicites**
3	14	What is the main "source of lime"? (a) Limestone (b) Sand (c) Clay (d) Iron ore **Ans:Limestone**
3	15	"Classification of lime" can be based on... (a) Its color (b) Its setting time (c) Its chemical composition (d) Its strength **Ans:Its chemical composition**
3	16	What is "slaking of lime"? (a) The process of adding sand to lime (b) The process of adding water to quicklime to produce hydrated lime (c) The process of adding cement to lime (d) The process of heating lime **Ans:The process of adding water to quicklime to produce hydrated lime**

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3	18	What is "lime putty"? (a) A dry powder of lime (b) A paste of lime and water (c) A mixture of lime and sand (d) A mixture of lime and cement **Ans:A paste of lime and water**
3	19	What is "Bitumen"? (a) A naturally occurring petroleum by-product (b) A naturally occurring limestone (c) A naturally occurring sand (d) A naturally occurring clay **Ans:A naturally occurring petroleum by-product**
3	20	"Tar" is a viscous black liquid obtained from... (a) Petroleum distillation (b) The destructive distillation of organic materials like coal or wood (c) The heating of limestone (d) The heating of sand **Ans:The destructive distillation of organic materials like coal or wood**
3	21	"Asphalt" is a mixture of... (a) Bitumen and aggregates (b) Tar and aggregates (c) Bitumen and sand (d) Tar and sand **Ans:Bitumen and aggregates**
3	22	Bitumen and asphalt are primarily used for... (a) Building foundations (b) Road paving and roofing (c) Wall cladding (d) Decorative purposes **Ans:Road paving and roofing**
3	23	"Portland Pozzolanic Cement" is preferred over OPC for... (a) Its high initial strength (b) Its high heat of hydration (c) Its improved durability and resistance to chemical attack (d) Its low cost **Ans:Its improved durability and resistance to chemical attack**
3	24	The "water-cement ratio" has a direct effect on... (a) The color of the concrete (b) The slump of the concrete (c) The strength and durability of the concrete (d) The setting time of the concrete **Ans:The strength and durability of the concrete**
3	25	"Lime putty" is primarily used for... (a) Structural concrete (b) Plastering and masonry work (c) Road paving (d) Roofing **Ans:Plastering and masonry work**

U.NO	Q NO	QUESTIONS
3	27	A concrete mix requires 140 kg of water. If the water-cement ratio is 0.5, what is the required amount of cement? (a) 250 kg (b) 280 kg (c) 300 kg (d) 350 kg **Ans:280 kg**
3	28	A concrete cube of 150 mm side requires 5 kg of cement. If the water-cement ratio is 0.45, how much water is needed? (a) 2.25 kg (b) 2.5 kg (c) 2.75 kg (d) 3.0 kg **Ans:2.25 kg**
3	29	A cement paste is made with 1 kg of cement and 0.4 kg of water. What is the water-cement ratio? (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7 **Ans:0.4**
3	30	A concrete mix uses 300 kg of cement per cubic meter. If the water-cement ratio is 0.45, how much water is needed? (a) 120 kg (b) 135 kg (c) 150 kg (d) 165 kg **Ans:135 kg**
3	31	A concrete mix requires 160 kg of water. If the water-cement ratio is 0.4, what is the required amount of cement? (a) 300 kg (b) 350 kg (c) 400 kg (d) 450 kg **Ans:400 kg**
3	32	A concrete cube of 150 mm side requires 6 kg of cement. If the water-cement ratio is 0.5, how much water is needed? (a) 2.5 kg (b) 3.0 kg (c) 3.5 kg (d) 4.0 kg **Ans:3.0 kg**
3	33	A cement paste is made with 1.5 kg of cement and 0.6 kg of water. What is the water-cement ratio? (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7 **Ans:0.4**
3	34	A concrete mix uses 350 kg of cement per cubic meter. If the water-cement ratio is 0.5, how much water is needed? (a) 150 kg (b) 165 kg (c) 175 kg (d) 185 kg **Ans:175 kg**

U.NO	Q NO	QUESTIONS
3	36	A concrete cube of 150 mm side requires 7 kg of cement. If the water-cement ratio is 0.4, how much water is needed? (a) 2.8 kg (b) 3.0 kg (c) 3.2 kg (d) 3.4 kg **Ans:2.8 kg**
3	37	A cement paste is made with 2 kg of cement and 0.8 kg of water. What is the water-cement ratio? (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7 **Ans:0.4**
3	38	A concrete mix uses 400 kg of cement per cubic meter. If the water-cement ratio is 0.4, how much water is needed? (a) 150 kg (b) 160 kg (c) 170 kg (d) 180 kg **Ans:160 kg**
3	39	A concrete mix requires 200 kg of water. If the water-cement ratio is 0.5, what is the required amount of cement? (a) 350 kg (b) 400 kg (c) 450 kg (d) 500 kg **Ans:450 kg**
3	40	A concrete cube of 150 mm side requires 8 kg of cement. If the water-cement ratio is 0.45, how much water is needed? (a) 3.2 kg (b) 3.6 kg (c) 4.0 kg (d) 4.4 kg **Ans:3.6 kg**
3	41	A cement paste is made with 2.5 kg of cement and 1.25 kg of water. What is the water-cement ratio? (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7 **Ans:0.5**
3	42	A concrete mix uses 450 kg of cement per cubic meter. If the water-cement ratio is 0.45, how much water is needed? (a) 180 kg (b) 202.5 kg (c) 225 kg (d) 250 kg **Ans:202.5 kg**
3	43	A concrete mix requires 220 kg of water. If the water-cement ratio is 0.4, what is the required amount of cement? (a) 450 kg (b) 500 kg (c) 550 kg (d) 600 kg **Ans:550 kg**

U.NO	Q NO	QUESTIONS
3	45	A cement paste is made with 3 kg of cement and 1.2 kg of water. What is the water-cement ratio? (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7 **Ans:0.4**
3	46	A concrete mix uses 500 kg of cement per cubic meter. If the water-cement ratio is 0.4, how much water is needed? (a) 180 kg (b) 200 kg (c) 220 kg (d) 240 kg **Ans:200 kg**
3	47	A concrete mix requires 250 kg of water. If the water-cement ratio is 0.45, what is the required amount of cement? (a) 500 kg (b) 555.56 kg (c) 600 kg (d) 650 kg **Ans:555.56 kg**
3	48	A concrete cube of 150 mm side requires 10 kg of cement. If the water-cement ratio is 0.45, how much water is needed? (a) 4.0 kg (b) 4.5 kg (c) 5.0 kg (d) 5.5 kg **Ans:4.5 kg**
3	49	A cement paste is made with 3.5 kg of cement and 1.75 kg of water. What is the water-cement ratio? (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.7 **Ans:0.5**
3	50	A concrete mix uses 550 kg of cement per cubic meter. If the water-cement ratio is 0.5, how much water is needed? (a) 250 kg (b) 275 kg (c) 300 kg (d) 325 kg **Ans:275 kg**
4	1	"Seasoning of timber" is the process of... (a) Cutting timber into different sizes (b) Increasing the moisture content of timber (c) Reducing the moisture content of timber (d) Applying a protective coating to timber **Ans:Reducing the moisture content of timber**
4	2	Which of the following is a method of "seasoning of timber"? (a) Sawing (b) Kiln seasoning (c) Polishing (d) Painting **Ans:Kiln seasoning**

U.NO	Q NO	QUESTIONS
4	4	"Preservation of timber" is done to... (a) Increase its weight (b) Protect it from decay, insects, and fire (c) Increase its moisture content (d) Make it look better **Ans:Protect it from decay, insects, and fire**
4	5	"Wood products" are materials made from wood, such as... (a) Plywood (b) Cement (c) Steel (d) Glass **Ans:Plywood**
4	6	What is the main characteristic of a "good mortar"? (a) It should be sticky (b) It should be workable (c) It should be brittle (d) It should be weak **Ans:It should be workable**
4	7	"Grouting" is the process of... (a) Injecting a fluid grout into cracks or voids (b) Applying a layer of mortar on a surface (c) Mixing cement and water (d) Curing concrete **Ans:Injecting a fluid grout into cracks or voids**
4	8	"Guniting" is the process of... (a) Applying concrete with a sprayer (b) Mixing concrete by hand (c) Curing concrete with water (d) Applying a protective coating **Ans:Applying concrete with a sprayer**
4	9	What is the main component of "concrete"? (a) Cement, sand, and water (b) Cement, sand, aggregates, and water (c) Cement and water (d) Cement and aggregates **Ans:Cement, sand, aggregates, and water**
4	10	"Production of concrete" involves... (a) Mixing, transporting, placing, and curing (b) Only mixing and placing (c) Only mixing and curing (d) Only mixing **Ans:Mixing, transporting, placing, and curing**
4	11	"Mix ratios" for concrete are typically expressed as... (a) Cement: Sand: Aggregates (b) Sand: Cement: Aggregates (c) Aggregates: Sand: Cement (d) Water: Cement: Sand **Ans:Cement: Sand: Aggregates**

U.NO	Q NO	QUESTIONS
4	13	What is "Ready-mix concrete"? (a) Concrete prepared on site (b) Concrete prepared at a central plant and delivered to the site (c) Concrete prepared by hand (d) Concrete with high water content **Ans:Concrete prepared at a central plant and delivered to the site**
4	14	"Strength of concrete" is typically measured by its... (a) Compressive strength (b) Tensile strength (c) Shear strength (d) Bending strength **Ans:Compressive strength**
4	15	"Non-destructive testing" of concrete involves... (a) Breaking a concrete sample to test its strength (b) Using a rebound hammer or ultrasonic pulse velocity meter (c) Measuring the weight of the concrete (d) Measuring the volume of the concrete **Ans:Using a rebound hammer or ultrasonic pulse velocity meter**
4	16	"Durability of concrete" is its ability to... (a) Withstand its intended use over a long period of time without deterioration (b) Be easily mixed and placed (c) Be easily handled (d) Be easily transported **Ans:Withstand its intended use over a long period of time without deterioration**
4	17	What is a "damp-proof" course? (a) A layer of material that prevents the upward movement of water in a wall (b) A layer of material that prevents the downward movement of water in a wall (c) A layer of material that prevents the lateral movement of water (d) A layer of material that prevents the movement of heat **Ans:A layer of material that prevents the upward movement of water in a wall**
4	18	"Water-proof" materials are used to... (a) Allow water to pass through them (b) Prevent water from passing through them (c) Increase the moisture content of a surface (d) Decrease the moisture content of a surface **Ans:Prevent water from passing through them**
4	19	"Termite proof" in buildings refers to... (a) The use of materials that are resistant to termite attack (b) The use of materials that attract termites (c) The use of materials that are easy to cut (d) The use of materials that are easy to paint **Ans:The use of materials that are resistant to termite attack**
4	20	"Heat insulating materials" are used to... (a) Increase the heat transfer in a building (b) Reduce the heat transfer in a building (c) Increase the sound transfer in a building (d) Reduce the sound transfer in a building **Ans:Reduce the heat transfer in a building**

U.NO	Q NO	QUESTIONS
4	22	What is an "ideal paint"? (a) A paint that is easy to apply, has a good hiding power, and is durable (b) A paint that is difficult to apply (c) A paint that is not durable (d) A paint that is expensive **Ans:A paint that is easy to apply, has a good hiding power, and is durable**
4	23	"Distemper" is a type of paint that is... (a) Oil-based (b) Water-based (c) Plastic-based (d) Wood-based **Ans:Water-based**
4	24	"Varnishes" are used to... (a) Give a colored and opaque finish to a surface (b) Give a transparent and shiny finish to a surface (c) Give a rough and non-transparent finish (d) Give a matte finish to a surface **Ans:Give a transparent and shiny finish to a surface**
4	25	A concrete mix has a ratio of 1:2:4. What does the "4" refer to? (a) Cement (b) Sand (c) Aggregates (d) Water **Ans:Aggregates**
4	26	A concrete mix has a ratio of 1:3:6. If 50 kg of cement is used, how much sand and aggregates are needed? (a) Sand: 150 kg, Aggregates: 300 kg (b) Sand: 100 kg, Aggregates: 200 kg (c) Sand: 150 kg, Aggregates: 200 kg (d) Sand: 100 kg, Aggregates: 300 kg **Ans:Sand: 150 kg, Aggregates: 300 kg**
4	27	A concrete mix has a ratio of 1:2:4 by volume. If 1 m^3 of cement is used, how much sand and aggregates are needed? (a) Sand: 2 m^3, Aggregates: 4 m^3 (b) Sand: 3 m^3, Aggregates: 6 m^3 (c) Sand: 2 m^3, Aggregates: 3 m^3 (d) Sand: 4 m^3, Aggregates: 2 m^3 **Ans:Sand: 2 m^3, Aggregates: 4 m^3**
4	28	A mortar mix has a ratio of 1:3 by volume. If 2 bags of cement are used, how much sand is needed? (a) 4 bags (b) 6 bags (c) 8 bags (d) 10 bags **Ans:6 bags**
4	29	A timber log has a moisture content of 20%. After seasoning, the moisture content is 10%. By how much has the moisture content reduced? (a) 5% (b) 10% (c) 15% (d) 20% **Ans:0.1**

U.NO	Q NO	QUESTIONS
4	31	A mortar mix has a ratio of 1:4 by volume. If 3 bags of cement are used, how much sand is needed? (a) 9 bags (b) 10 bags (c) 12 bags (d) 15 bags **Ans:12 bags**
4	32	A timber log has a moisture content of 30%. After seasoning, the moisture content is 15%. By how much has the moisture content reduced? (a) 10% (b) 15% (c) 20% (d) 25% **Ans:0.15**
4	33	A concrete mix has a ratio of 1:1.5:3 by volume. If 1.5 m^3 of cement is used, how much sand and aggregates are needed? (a) Sand: 2.25 m^3, Aggregates: 4.5 m^3 (b) Sand: 2.5 m^3, Aggregates: 5 m^3 (c) Sand: 3 m^3, Aggregates: 6 m^3 (d) Sand: 3.5 m^3, Aggregates: 7 m^3 **Ans:Sand: 2.25 m^3, Aggregates: 4.5 m^3**
4	34	A mortar mix has a ratio of 1:5 by volume. If 4 bags of cement are used, how much sand is needed? (a) 15 bags (b) 18 bags (c) 20 bags (d) 25 bags **Ans:20 bags**
4	35	A timber log has a moisture content of 25%. After seasoning, the moisture content is 12%. By how much has the moisture content reduced? (a) 10% (b) 12% (c) 13% (d) 15% **Ans:0.13**
4	36	A concrete mix has a ratio of 1:2:4 by volume. If 2.5 m^3 of cement is used, how much sand and aggregates are needed? (a) Sand: 4 m^3, Aggregates: 8 m^3 (b) Sand: 5 m^3, Aggregates: 10 m^3 (c) Sand: 6 m^3, Aggregates: 12 m^3 (d) Sand: 7 m^3, Aggregates: 14 m^3 **Ans:Sand: 5 m^3, Aggregates: 10 m^3**
4	37	A mortar mix has a ratio of 1:6 by volume. If 5 bags of cement are used, how much sand is needed? (a) 25 bags (b) 30 bags (c) 35 bags (d) 40 bags **Ans:30 bags**
4	38	A timber log has a moisture content of 35%. After seasoning, the moisture content is 18%. By how much has the moisture content reduced? (a) 15% (b) 17% (c) 19% (d) 20% **Ans:0.17**

U.NO	Q NO	QUESTIONS
4	40	A mortar mix has a ratio of 1:3 by volume. If 3.5 bags of cement are used, how much sand is needed? (a) 10 bags (b) 10.5 bags (c) 11 bags (d) 11.5 bags **Ans:10.5 bags**
4	41	A timber log has a moisture content of 40%. After seasoning, the moisture content is 20%. By how much has the moisture content reduced? (a) 15% (b) 20% (c) 25% (d) 30% **Ans:0.2**
4	42	A concrete mix has a ratio of 1:2:4 by volume. If 3.5 m^3 of cement is used, how much sand and aggregates are needed? (a) Sand: 6 m^3, Aggregates: 12 m^3 (b) Sand: 7 m^3, Aggregates: 14 m^3 (c) Sand: 8 m^3, Aggregates: 16 m^3 (d) Sand: 9 m^3, Aggregates: 18 m^3 **Ans:Sand: 7 m^3, Aggregates: 14 m^3**
4	43	A mortar mix has a ratio of 1:4 by volume. If 4.5 bags of cement are used, how much sand is needed? (a) 16 bags (b) 17 bags (c) 18 bags (d) 19 bags **Ans:18 bags**
4	44	A timber log has a moisture content of 45%. After seasoning, the moisture content is 22%. By how much has the moisture content reduced? (a) 20% (b) 21% (c) 22% (d) 23% **Ans:0.23**
4	45	A concrete mix has a ratio of 1:1.5:3 by volume. If 4 m^3 of cement is used, how much sand and aggregates are needed? (a) Sand: 5 m^3, Aggregates: 10 m^3 (b) Sand: 6 m^3, Aggregates: 12 m^3 (c) Sand: 7 m^3, Aggregates: 14 m^3 (d) Sand: 8 m^3, Aggregates: 16 m^3 **Ans:Sand: 6 m^3, Aggregates: 12 m^3**
4	46	A mortar mix has a ratio of 1:5 by volume. If 5.5 bags of cement are used, how much sand is needed? (a) 25 bags (b) 27.5 bags (c) 30 bags (d) 32.5 bags **Ans:27.5 bags**
4	47	A timber log has a moisture content of 50%. After seasoning, the moisture content is 25%. By how much has the moisture content reduced? (a) 20% (b) 25% (c) 30% (d) 35% **Ans:0.25**

U.NO	Q NO	QUESTIONS
4	49	A mortar mix has a ratio of 1:6 by volume. If 6 bags of cement are used, how much sand is needed? (a) 30 bags (b) 32 bags (c) 36 bags (d) 40 bags **Ans:36 bags**
4	50	A timber log has a moisture content of 55%. After seasoning, the moisture content is 28%. By how much has the moisture content reduced? (a) 25% (b) 27% (c) 30% (d) 32% **Ans:0.27**
5	1	"Sound insulating materials" are used to... (a) Increase the sound transfer in a building (b) Reduce the sound transfer in a building (c) Increase the heat transfer in a building (d) Reduce the heat transfer in a building **Ans:Reduce the sound transfer in a building**
5	2	What is a characteristic of an "ideal paint"? (a) It should be difficult to apply (b) It should have poor hiding power (c) It should be durable (d) It should be expensive **Ans:It should be durable**
5	3	"Distemper" is a type of paint that is... (a) Oil-based (b) Water-based (c) Plastic-based (d) Wood-based **Ans:Water-based**
5	4	"Varnishes" are used to give a... (a) Colored and opaque finish (b) Transparent and shiny finish (c) Rough and non-transparent finish (d) Matte finish **Ans:Transparent and shiny finish**
5	5	What is "Galvanised iron"? (a) Iron coated with paint (b) Iron coated with zinc (c) Iron coated with lead (d) Iron coated with tin **Ans:Iron coated with zinc**
5	6	"Structural steel" is used for... (a) Decorative purposes (b) Load-bearing frames of buildings and bridges (c) Plumbing (d) Electrical wiring **Ans:Load-bearing frames of buildings and bridges**

U.NO	Q NO	QUESTIONS
5	8	"Aluminium" is a metal known for its... (a) High density and low strength (b) Low density and high corrosion resistance (c) High weight (d) Low ductility **Ans:Low density and high corrosion resistance**
5	9	"Composites" are materials made from... (a) A single component (b) Two or more different materials (c) Only metals (d) Only plastics **Ans:Two or more different materials**
5	10	What is a characteristic of "plastics"? (a) They are brittle (b) They are non-malleable (c) They have a low strength-to-weight ratio (d) They have a high strength-to-weight ratio **Ans:They have a high strength-to-weight ratio**
5	11	"PVC pipes" are used for... (a) Structural applications (b) Water supply and sanitary plumbing (c) High-pressure gas lines (d) Electrical conduits **Ans:Water supply and sanitary plumbing**
5	12	"UPVC pipes" are... (a) Rigid and have high tensile strength (b) Flexible and have low tensile strength (c) Rigid and have low tensile strength (d) Flexible and have high tensile strength **Ans:Rigid and have high tensile strength**
5	13	"CPVC" is a type of plastic used for... (a) Cold water supply (b) Hot and cold water supply (c) Only hot water supply (d) Electrical plumbing **Ans:Hot and cold water supply**
5	14	"Standards as per BIS" ensure that plastic products are... (a) Uniform in size and quality (b) Of low quality (c) Not recyclable (d) Not durable **Ans:Uniform in size and quality**
5	15	What is "RCC"? (a) A type of plastic (b) Reinforced Cement Concrete (c) A type of steel (d) A type of timber **Ans:Reinforced Cement Concrete**

U.NO	Q NO	QUESTIONS
5	17	"G.I. Sheets" are made of... (a) Galvanised Iron (b) Gold Iron (c) Glass Iron (d) Graphite Iron **Ans:Galvanised Iron**
5	18	"Galvalume sheets" are coated with an alloy of... (a) Zinc and aluminium (b) Zinc and iron (c) Aluminium and iron (d) Zinc and copper **Ans:Zinc and aluminium**
5	19	"Insulated roofing sheets" are used to... (a) Increase heat transfer (b) Reduce heat transfer and noise (c) Increase noise transfer (d) Decrease fire resistance **Ans:Reduce heat transfer and noise**
5	20	A "false ceiling" is a... (a) Main structural ceiling (b) Secondary ceiling hung below the main ceiling (c) Wall (d) Floor **Ans:Secondary ceiling hung below the main ceiling**
5	21	"Materials used for false ceiling" include... (a) Cement and sand (b) PVC and gypsum boards (c) Steel and concrete (d) Timber **Ans:PVC and gypsum boards**
5	22	What is the "importance of facade design in architecture"? (a) It only affects the weight of the building (b) It only affects the cost of the building (c) It only affects the strength of the building (d) It impacts aesthetics, energy efficiency, and durability **Ans:It impacts aesthetics, energy efficiency, and durability**
5	23	"Insulated glass" is used in facades to... (a) Increase heat transfer (b) Reduce heat transfer and improve energy efficiency (c) Increase sound transfer (d) Reduce transparency **Ans:Reduce heat transfer and improve energy efficiency**
5	24	"Aluminium composite panels" (ACP) are a type of facade material known for... (a) Their light weight and rigidity (b) Their high weight and low rigidity (c) Their low durability (d) Their high cost **Ans:Their light weight and rigidity**

U.NO	Q NO	QUESTIONS
5	26	"Wood plastic composites" are a type of facade material made from... (a) Only wood (b) Only plastic (c) A mixture of wood flour and thermoplastics (d) A mixture of wood and steel **Ans:A mixture of wood flour and thermoplastics**
5	27	"Cladding" is the process of... (a) Applying paint to a facade (b) Covering a building's exterior with a protective and decorative layer (c) Building a wall (d) Building a roof **Ans:Covering a building's exterior with a protective and decorative layer**
5	28	A "type of cladding" is... (a) Brick cladding (b) Concrete cladding (c) Glass cladding (d) All of the above **Ans:All of the above**
5	29	A galvanized iron sheet has a thickness of 0.5 mm. If a 1 m x 2 m sheet is used, what is the volume of the sheet? (a) 0.001 m^3 (b) 0.002 m^3 (c) 0.003 m^3 (d) 0.004 m^3 **Ans:0.001 m^3**
5	30	A steel pipe has an outer diameter of 50 mm and an inner diameter of 40 mm. What is the cross-sectional area of the pipe? (a) 706.86 mm^2 (b) 725.36 mm^2 (c) 750.56 mm^2 (d) 785.40 mm^2 **Ans:706.86 mm^2**
5	31	A PVC pipe has an outer diameter of 110 mm and a thickness of 4 mm. What is the inner diameter of the pipe? (a) 102 mm (b) 104 mm (c) 106 mm (d) 108 mm **Ans:102 mm**
5	32	A UPVC water tank has a capacity of 1000 litres. If the tank is cylindrical with a height of 1.5 m, what is the radius of the tank? (1000 L = 1 m^3) (a) 0.46 m (b) 0.52 m (c) 0.58 m (d) 0.65 m **Ans:0.46 m**
5	33	A G.I. sheet has a weight of 10 kg/m^2. What is the weight of a 5 m x 10 m sheet? (a) 200 kg (b) 300 kg (c) 400 kg (d) 500 kg **Ans:500 kg**

U.NO	Q NO	QUESTIONS
5	35	An aluminium composite panel has a thickness of 3 mm. A panel of 1 m x 2 m is used. What is the volume of the panel? (a) 0.006 m^3 (b) 0.005 m^3 (c) 0.004 m^3 (d) 0.003 m^3 **Ans:0.006 m^3**
5	36	A steel beam has a cross-sectional area of 100 cm^2. What is the weight of a 5 m long beam if the density of steel is 7850 kg/m^3? (a) 392.5 kg (b) 400 kg (c) 420 kg (d) 450 kg **Ans:392.5 kg**
5	37	A PVC water tank has a capacity of 2000 litres. If the tank is cylindrical with a height of 2 m, what is the radius of the tank? (1000 L = 1 m^3) (a) 0.56 m (b) 0.58 m (c) 0.60 m (d) 0.62 m **Ans:0.56 m**
5	38	A G.I. sheet has a weight of 12 kg/m^2. What is the weight of a 6 m x 12 m sheet? (a) 800 kg (b) 864 kg (c) 900 kg (d) 950 kg **Ans:864 kg**
5	39	A false ceiling is installed in a room of 5 m x 6 m. What is the total area of the false ceiling? (a) 25 m^2 (b) 30 m^2 (c) 35 m^2 (d) 40 m^2 **Ans:30 m^2**
5	40	An aluminium composite panel has a thickness of 4 mm. A panel of 1.5 m x 2.5 m is used. What is the volume of the panel? (a) 0.015 m^3 (b) 0.018 m^3 (c) 0.020 m^3 (d) 0.025 m^3 **Ans:0.015 m^3**
5	41	A steel beam has a cross-sectional area of 120 cm^2. What is the weight of a 6 m long beam if the density of steel is 7850 kg/m^3? (a) 565.2 kg (b) 580 kg (c) 600 kg (d) 620 kg **Ans:565.2 kg**
5	42	A PVC water tank has a capacity of 3000 litres. If the tank is cylindrical with a height of 2.5 m, what is the radius of the tank? (1000 L = 1 m^3) (a) 0.62 m (b) 0.64 m (c) 0.68 m (d) 0.70 m **Ans:0.68 m**

U.NO	Q NO	QUESTIONS
5	44	A false ceiling is installed in a room of 6 m x 7 m. What is the total area of the false ceiling? (a) 35 m^2 (b) 40 m^2 (c) 42 m^2 (d) 45 m^2 **Ans:42 m^2**
5	45	An aluminium composite panel has a thickness of 5 mm. A panel of 2 m x 3 m is used. What is the volume of the panel? (a) 0.030 m^3 (b) 0.035 m^3 (c) 0.040 m^3 (d) 0.045 m^3 **Ans:0.030 m^3**
5	46	A steel beam has a cross-sectional area of 150 cm^2. What is the weight of a 7 m long beam if the density of steel is 7850 kg/m^3? (a) 800 kg (b) 824.25 kg (c) 850 kg (d) 880 kg **Ans:824.25 kg**
5	47	A PVC water tank has a capacity of 4000 litres. If the tank is cylindrical with a height of 3 m, what is the radius of the tank? (1000 L = 1 m^3) (a) 0.65 m (b) 0.68 m (c) 0.70 m (d) 0.73 m **Ans:0.73 m**
5	48	A G.I. sheet has a weight of 18 kg/m^2. What is the weight of a 8 m x 16 m sheet? (a) 2000 kg (b) 2150 kg (c) 2304 kg (d) 2400 kg **Ans:2304 kg**
5	49	A false ceiling is installed in a room of 7 m x 8 m. What is the total area of the false ceiling? (a) 50 m^2 (b) 56 m^2 (c) 60 m^2 (d) 65 m^2 **Ans:56 m^2**
5	50	An aluminium composite panel has a thickness of 6 mm. A panel of 2.5 m x 3.5 m is used. What is the volume of the panel? (a) 0.045 m^3 (b) 0.0525 m^3 (c) 0.060 m^3 (d) 0.065 m^3 **Ans:0.0525 m^3**

PART B/C	UNIT NO	Q.No.	QUESTION
B	1	1	What is the primary difference between conventional and new and advanced building materials?
B	1	2	Define a green building material and provide one example.
B	1	3	Name five eco-friendly and green construction materials.
B	1	4	What is the definition of energy-efficient building materials?
B	1	5	Explain the difference between density and specific gravity of a material.
B	1	6	Define permeability in the context of building materials.
B	1	7	How does thermal conductivity of a material affect its use in construction?
B	1	8	What is the definition of durability of a building material?
B	1	9	List two key factors affecting the durability of building materials.
B	1	10	Differentiate between natural and artificial aggregates.
B	1	11	What are lightweight aggregates and where are they typically used?
B	1	12	What is the primary purpose of recycling aggregates in construction?
B	1	13	Why is it important to test water used in construction works for sulphates and chlorides?
B	1	14	According to IS456:2000, what is the permissible limit for organic solids in water used for concrete?
B	1	15	As per IS456:2000, what is the maximum permissible limit of chloride content in water for concrete works?
B	2	1	What is the ideal composition of good brick earth?
B	2	2	What is the minimum compressive strength of a Class A brick as per BIS?
B	2	3	List two key characteristics of a good brick.
B	2	4	What is the main use of a special type of brick like a bullnose brick?
B	2	5	What are the main constituents of fly ash bricks?
B	2	6	What is the primary characteristic that distinguishes a solid block from a hollow block?
B	2	7	Define AAC blocks and state one of their main properties.

B	2	8	What is the difference between earthenware and stoneware?
B	2	9	Name one key property of porcelain and its primary use in construction.
B	2	10	What is the main characteristic of glazed tiles?
B	2	11	What are thermal care tiles and what is their primary function?
B	2	12	What are the main constituents of ordinary glass?
B	2	13	How is glass typically classified based on its manufacturing process?
B	2	14	What are firebricks and where are they used?
B	2	15	What is terracotta and what are its typical uses?
B	3	1	What are the primary constituents that make up ordinary Portland cement (OPC)?
B	3	2	Briefly explain the role of pozzolanic materials in Portland Pozzolanic cement.
B	3	3	What is the significance of the water-cement ratio in concrete mix design?
B	3	4	How does the hydration of cement differ from the setting of cement?
B	3	5	What are "Bogus compounds" and why are they considered undesirable in cement?
B	3	6	Define fly ash and specify its two main types based on its source.
B	3	7	How is Ground Granulated Blast Furnace Slag (GGBFS) produced?
B	3	8	What are two examples of natural pozzolans?
B	3	9	Name two common sources of lime.
B	3	10	Differentiate between fat lime and hydraulic lime.
B	3	11	What is the purpose of adding sand to lime mortar?
B	3	12	What is lime putty and how is it prepared?
B	3	13	What is the primary difference between tar and bitumen in terms of their origin?
B	3	14	Name two common applications of bitumen.
B	3	15	Briefly explain the difference between bitumen and asphalt.

B	4	1	What is the primary objective of seasoning timber?
B	4	2	Name two common defects that can occur in timber.
B	4	3	List two methods for the preservation of timber.
B	4	4	What is the difference between plywood and veneer?
B	4	5	What are the key ingredients that constitute a good mortar?
B	4	6	Define the term "Grouting" in civil engineering.
B	4	7	Why is mixing a critical step in the production of concrete?
B	4	8	What is meant by the "workability" of concrete?
B	4	9	Name two non-destructive tests used for assessing the strength of concrete.
B	4	10	What is the main purpose of providing a damp-proof course (DPC) in a building?
B	4	11	What is the primary function of heat-insulating materials in buildings?
B	4	12	Give an example of a sound-insulating material.
B	4	13	What is the characteristic of an ideal paint?
B	4	14	What is the primary difference between paint and distemper?
B	4	15	What is the main application of varnish in construction?
B	5	1	What is the main difference in composition between steel and galvanized iron?
B	5	2	What is the key advantage of using stainless steel in construction?
B	5	3	Name two market forms of structural steel sections.
B	5	4	What are "cold-formed light gauge sections" and where are they typically used?
B	5	5	What is a composite material in the context of construction?
B	5	6	List two key characteristics of plastics that make them suitable for construction.
B	5	7	What do UPVC and CPVC stand for, and how do they differ?
B	5	8	What is the purpose of BIS standards for PVC materials in plumbing?

B	5	9	Briefly describe the difference between RCC roofing and AC sheets.
B	5	10	What is the main advantage of using a "Galvalume sheet" for roofing?
B	5	11	What is the purpose of a false ceiling?
B	5	12	Name two materials commonly used for false ceilings.
B	5	13	Why is facade design important in architecture?
B	5	14	What is the composition of an Aluminum Composite Panel (ACP)?
B	5	15	Define cladding in the context of facade design.
C	1	1	Explain with examples the concept of "sustainable building materials" and their importance.
C	1	2	Describe the role of any two energy-efficient building materials in reducing a building's energy consumption.
C	1	3	Describe the process of how weathering resistance of a material can be determined and why it is important.
C	1	4	Explain with a suitable example how the "sustainability to freezing and thawing" property of a material is crucial in specific climatic conditions.
C	1	5	Explain the three main factors affecting the durability of concrete.
C	1	6	A sample of aggregate weighs 1500 g in a saturated surface-dry condition and 1450 g after oven-drying. Calculate the water absorption of the aggregate.
C	1	7	Describe the process of recycling aggregates and its benefits.
C	1	8	Why is the presence of sulphates and chlorides in water deleterious to concrete? Explain the mechanism of their effect.
C	1	9	Explain the permissible limits of deleterious materials in water as per Indian Standard, IS456:2000, for concrete mix.
C	1	10	What are the requirements of water used in construction works as per Indian Standards, and why is potability not a sufficient indicator?
C	2	1	A brick sample is to be tested for compressive strength. Explain the procedure.
C	2	2	Explain the importance of compressive strength and water absorption for good bricks.
C	2	3	Describe the key characteristics of AAC blocks that make them suitable for modern construction.
C	2	4	Compare and contrast the properties and uses of solid blocks and hollow blocks.
C	2	5	Explain the process of manufacturing porcelain and how it contributes to its specific properties.
C	2	6	Discuss the characteristics and uses of ceramic tiles, glazed tiles, and roof tiles.

C	2	7	Describe the classification of glass based on its constituents and manufacturing processes.
C	2	8	A project requires the construction of a partition wall. Recommend a suitable masonry block (fly ash, solid, or hollow) and justify your choice.
C	2	9	Explain the factors that affect the compressive strength of a brick.
C	2	10	A special type of brick is required for constructing a manhole. Recommend a suitable type and explain its use.
C	3	1	A concrete mix has a water-cement ratio of 0.45. If the total volume of cement is 150 kg, what is the required amount of water? Explain how this ratio affects the strength of the resulting concrete.
C	3	2	Describe the process of formation of Bogus compounds and explain why they are detrimental to the quality of cement.
C	3	3	Explain the difference between Ground Granulated Blast Furnace Slag (GGBFS) and fly ash as supplementary cementitious materials.
C	3	4	Classify lime based on its composition and properties, providing a brief description for each type.
C	3	5	Explain the chemical composition of Ordinary Portland Cement (OPC) in terms of its major chemical compounds and their proportions.
C	3	6	Describe the process of slaking lime and its importance in preparing lime mortar.
C	3	7	Explain the key applications of bitumen, tar, and asphalt, highlighting their distinct uses.
C	3	8	How does silica fume improve the properties of concrete?
C	3	9	Outline the three main stages of cement hydration.
C	3	10	What is the difference between lime mortar and cement mortar? Which is more suitable for historic masonry and why?
C	4	1	Describe two methods of seasoning timber. Explain the pros and cons of each method.
C	4	2	What are the characteristics of a good mortar? Explain how these characteristics are achieved.
C	4	3	For a concrete mix of 1:1.5:3, calculate the quantity of cement, sand, and coarse aggregate required for 1 cubic meter of concrete. Assume a density of 1440 kg/m³ for fresh concrete.
C	4	4	Explain the concept of "Ready Mix Concrete" and list its key advantages over site-mixed concrete.
C	4	5	What are the primary factors affecting the durability of concrete? Explain how two of these factors affect durability.
C	4	6	Explain the purpose of termite-proofing and how it is achieved in buildings.
C	4	7	Describe the key characteristics of an ideal paint and explain why a proper mix of these characteristics is essential.
C	4	8	Briefly describe the main types of paint based on their binder and give a typical application for each.

C	4	9	Differentiate between grouting and guniting, highlighting their respective applications.
C	4	10	A concrete cylinder of 150 mm diameter and 300 mm length is tested under a compressive load of 250 kN. Calculate the compressive strength of the concrete.
C	5	1	Explain the process of galvanization and its significance in construction.
C	5	2	Describe the characteristics and applications of structural steel, aluminum, and composite materials, and explain why each is preferred for specific applications.
C	5	3	Compare and contrast the properties and uses of PVC and CPVC pipes in plumbing.
C	5	4	Discuss the advantages of using insulated roofing sheets over traditional roofing materials like GI sheets.
C	5	5	Explain the role of insulated glass in facade design and how it contributes to a building's energy efficiency.
C	5	6	Briefly explain the manufacturing process of cold-formed light gauge steel sections and their primary applications in modern construction.
C	5	7	Describe the key characteristics of plastics and their advantages and disadvantages when used as a construction material.
C	5	8	Explain the different types of false ceilings based on their material, providing a brief description of each.
C	5	9	What is the difference between Fiber Cement and Wood Plastic Composites? Explain their respective uses in facade design.
C	5	10	A building's facade is to be clad with rectangular aluminum panels. The facade area is 500 m2. If the panels are 1.2 m wide and 2.4 m long, calculate the number of panels needed. Assume 5% wastage.