



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)

(ISO/IEC -270001 – 2005 certified)

SUMMER -2019 EXAMINATION

Subject code: 17209

Model Answer

Important Instructions to examiners:

- 1) The answer should be examined by keywords and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language error such as grammatical, spelling errors should not be given more importance. (Not applicable for subject English and communication skill).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figure drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In the some cases, the assumed constants values may vary and there may be some difference in the candidates answer and model answer.
- 6) In case of some questions credit may be given by judgment on part of examiner of relevant answer based on candidates understanding

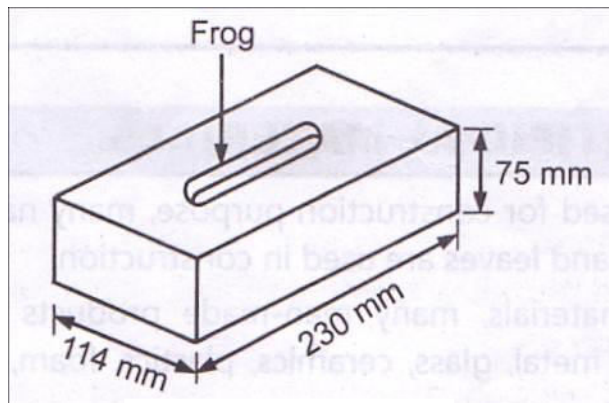
Q. No.	Question and Model Answers	Marks
Q.1.	Attempt any TEN of the following:	20
a)	Enlist any four types of cement.	
Ans :	1. Ordinary Portland Cement:- 2. White Cement:- 3. Coloured cement 4. quick setting cement: 5. Rapid hardening Cement 6. Expanding cement	Any four 1/2 M for each
b)	Define the term "Soil".	
Ans :	As Per I.S. 2809-1972: Soil is sediment or other unconsolidated accumulation of solid particles produced by physical and chemical disintegration of rock. OR As per Layman's Definition: The upper surface of earth or the earth crust containing loose material, with anyone or mixture of clays and gravel pebbles etc. OR As per Agriculturists Definition: Part of the earth surface which supports, sustains and nourishes plants. .	2M

c)	State any two applications of quantity surveying.	
Ans :	<ol style="list-style-type: none"> 1) To understanding, analyzing, and reporting on the costs associated with construction projects. 2) To determine the average material required. 3) To estimate future material prices or include as a % for escalation costs in the estimate or tender. 4) To calculate the labour productivity from past project information for all construction activities and use it while estimating labour costs as well as total time to complete the different activities. 	1M each any two
d)	State role of environmental engineering in human life.	
Ans :	<ol style="list-style-type: none"> 1) Water supply and water treatment plant units design and construction. 2) Sanitary engineering and sanitary units design and construction. 3) Pollution control of air, water, land and noise. 	1M each any two
e)	Explain characteristics of good timber.	
Ans :	<ol style="list-style-type: none"> 1) Appearance: A freshly cut surface of timber should exhibit hard and shining appearance. 2) Colour: The colour of timber should preferably be dark. 3) Defects: A good timber should be free from serious defects such as dead knots, flaws, shakes etc. 4) Durability: A good timber should be durable. 5) Elasticity: This is the property by which timber returns to its original shape when load causing its deformation is removed. 6) Fibres: The timber should have straight fibres. 7) Fire resistance: The timber is a bad conductor of heat. A dense wood offers good resistance to the fire and it requires sufficient heat to cause a flame. 8) Hardness: A good timber should be hard i.e. it should offer resistance when it is being penetrated by another body. 9) Mechanical Wear: A good timber should not deteriorate easily due to mechanical wear or abrasion. 10) Shape: A good timber should be capable of retaining its shape during conversion or seasoning. 11) Smell: A good timber should have sweet smell. 12) Sound: A good timber should give out a clear ringing sound when struck. A dull heavy sound, when struck, indicates decayed timber. 13) Strength: A good timber should be strong for working as structural member such as joist, beam, rafter etc. 14) Structure: It should be uniform. 15) Toughness: A good timber should be tough i.e. it should be capable of offering resistance to the shocks due to vibrations 16) Water permeability: A good timber should have low water permeability which is measured by the quantity of water filtered through a unit surface area of specimen of wood. 17) Weathering effects: A good timber should be able to stand reasonably the weathering effects. 18) Weight: The timber with heavy weight is considered to be sound and strong. 19) Working condition: The timber should be easily workable. It should not clog the teeth of saw and should be capable of being easily planed or made smooth. 	1M each any two

f)	State the use of Sun-mica.	
Ans :	1) For furniture. 2) For decorative article and moulds. 3) For decorative glazing appearance. 4) To resist acidic effects. 5) It is not affected by moisture and weather conditions.	1M each any two
g)	State any two applications of Transportation Engineering.	
Ans :	1. To maintain safety, adequacy and economy in the means of transport for the need of society. 2. Civil engineer work to move people, goods and materials safely and efficiently from one place to another place. 3. Civil engineer designs, constructs and maintains all types of transportation facilities, including airport, highway. Railway track and docks and harbours. 4. Civil engineers are also involved in the construction of bridge tunnels etc. 5. Remote areas and rural areas become accessible and communicable if connected by proper means of transport.	1M each any two
h)	Enlist types of fibres	
Ans :	1. Carbon fibers 4. Asbestos fibers 2. Glass fibers 5. steel fibers 3. Plastic fibers 6. Jute fibers	Any four 1/2 M for each
i)	State any two properties of POP.	
Ans :	1. It is light in weight. 2. It is fire resistant and does not allow heat to pass easily. 3. It shows good adhesion to fibrous material.plaster,wood work. 4. It is not affected by bacteria. 5. It sets with negligible shrinkage on drying. 6. It can be moulded to any shape. 7. It becomes hard after moulding & setting. 8. It is not easily soluble in water.	1M each any two
j)	State any two artificial materials used in construction.	
Ans :	a) Bricks- Bricks are made up of clay. They are used in brick masonry construction. b) Tiles- Tile is used for Flooring and roofing. Varies 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	1M each any two

	veneers varies from 0.4mm to 0.6mm or more.	
k)	State any two uses of coconut leaves.	
Ans :	1) Coconut leaves can be used as material to make variety of products for furnish and decorating. 2) Coconut leaves are used to produce good quality of paper pulp, hats and mats, fruit trays, brooms, bags etc. 3) It is also used for beverage, dye stuff and medicine purposes.	1M each any two
l)	State name of any two paints used for painting.	
Ans :	1) Aluminium paint: It contains finely ground aluminium in spirit or oil varnish. It is widely used for painting gas tanks, water pipes and oil tanks. 2) Oil Paint: This is ordinary paint and it is generally applied in three coats of varying compositions. The oil paints are used in generally for all types of surfaces, such as wood work, walls, ceiling, metal work etc. 3) Enamel Paint: It contains white lead, oil, petroleum spirit and resinous material. It can be used for both external and internal walls. 4) Bituminous paint : This type of paint is manufactured by dissolving asphalt or vegetable bitumen in oil or petroleum. It is used for painting iron works under water. 5) Emulsion Paint: It contains binding materials such as polyvinyl acetate, synthetic resins etc. This paint is recommended for use on stucco, bricks and masonry surfaces which contain free alkali. 6) Cement Paint: This paint consists of white cement, pigment, accelerator and other additives. Cements paints are being extensively used for painting plastered brickwork, stone masonry and concrete.	1M each any two
m)	State any two field test carried on brick.	
Ans :	1) Appearance & dimension shape: The brick must be well burnt, copper colored or reddish in color, free from cracks and with sharp edges. 2) Hardness Test: A scratch is made on brick surface with the help of a finger nail. If no impression is left on the surface, brick is treated as to be sufficiently hard. 3) Sounding/Ringing Test: Two bricks are struck with each other, then it should give a clear metallic ringing sound, it indicated brick is well burnt. 4) Impact Test: The burnt clay bricks are dropped flat on hard ground from a height of about 1m, it should not crush into pieces, it indicates good strength of brick.	1M each any two
n)	State any two properties of balustrades.	
Ans :	1) The combined framework of handrail and balusters is known as balustrade. 2) It is a moulded precast concrete product used in stair construction. 3) Baluster is a vertical member supporting the handrail. 4) Balustrade is used to provide protection for the users of the stair. 5) It is provided to minimize the danger of accidents. 6) It is precasted in various shapes and sizes as per architectural designs. 7) It gives the better appearance for staircase and porch structures.	1M each any two
Q.2.	Attempt any <u>FOUR</u> of the following:	16
a)	Explain the geological classification of rocks.	
Ans :	Geological classification is based on the mode or process of formation of a rock. Thus, some rocks may be formed from natural hot molten materials. Others may be formed at ordinary temperatures from compaction of particles or sediments, and still. Therefore, in the geological classification of rocks following three types of rocks are	2M

<p>recognized:-Igneous, Sedimentary & Metamorphic rocks.</p> <p>(i) Igneous Rocks: All those rocks that have been formed by cooling and crystallization from an originally hot and molten material are grouped as Igneous Rocks. They are the most abundant rocks of the crust depth-wise. The hot molten material occurs below the surface of the earth and is known as MAGMA. Quite Often, it erupts out at the surface as LAVA from cracks in the crust called volcanoes. MAGMA may cool and crystallize below the surface and change it into solid rocks. Similarly, lava flowing over the surface (even underwater in oceans) may also change it into rocks. Three different types of Igneous rocks are thus formed:</p> <p>(a) PLUTONIC: Formed at great depths, generally from 210 km below the surface. These have coarse crystals. <i>Examples: Granites, Syenites', Gabbros.</i></p> <p>(b) HYPABYSSAL: Formed at the intermediate depth below the surface generally up to 2 km. These have mixed characters. <i>Examples: Porphyries of various types.</i> <i>The Plutonic and Hypabyssal are sometimes grouped as INTRUSIVE ROCKS.</i></p> <p>(c) VOLCANIC: These are formed on the surface of the earth, even underwater in oceans from the cooling of lava from volcanoes. They are also called extrusive rocks and are commonly made up of very fine crystals. <i>Examples: Basalts and Traps.</i></p> <p>(ii) Sedimentary Rocks: These <i>Types of Rocks</i> are also called secondary rocks. At any time, the existing rocks on the surface of the earth are being broken into smaller particles by the natural process of decay and decomposition called <i>weathering and erosion</i>. Atmospheric gases, temperature variation, wind, water, and ice are some natural agencies which break the existing rocks into small fragments and sediments. These particles are then carried away and deposited at other places such as at sea-bed, lake-bed, river-bed and so on.</p> <p>Gradually, the accumulated particles get compressed and compacted under their own load and are thereby transformed into rock-solid cohesive masses of particles.</p> <p>In some cases, the particles may be bound together by some natural cementing material; with or without any pressure. These are also sedimentary rocks.</p> <p>In seas and oceans, a large number of sea-organisms live and die. Their hard parts also accumulate at the sea-bed and are gradually transformed into rocks.</p> <p>Since the particles in such rocks are derived from organisms, they are called <i>organically formed sedimentary rocks</i> in comparison to the <i>mechanically formed sedimentary rocks</i> of the first type.</p> <p>The third category of sedimentary rocks is formed due to chemical processes like evaporation and precipitation. Naturally, they are designated as chemically formed sedimentary rocks.</p> <p>The sedimentary rocks are very widespread, area wise, on the surface of the earth. Depth-wise, however, they form only a small proportion of the crust.</p> <p>Best known and common sedimentary rocks are <u>Sandstones</u>, Quartzite, Limestones, Dolomites, and Shales.</p>	<p>2M for any one explanation</p>
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	<p>(iii) Metamorphic Rocks: This rock type is originally either igneous rocks or sedimentary rocks which have undergone some change in their structure, shape or composition.</p> <p>The change might have been due to an increase in temperature or pressure or both. Sometimes, the change is due to some chemically active fluids that act on the pre-existing rocks.</p> <p>The nature of change in the rock will depend on;</p> <ul style="list-style-type: none"> (i) The nature of existing rock. (ii) The type of factors operating on the rock (temperature, pressure, fluids). (iii) The intensity of factors. (iv) The duration of action. <p>Very interesting new rock type may be formed from pre-existing igneous or sedimentary rocks depending upon the above conditions.</p> <p>Thus <u>limestone</u>, a sedimentary rock, may change to a variety of MARBLES. Similarly, sandstone, again a sedimentary rock, may change into a very hard QUARTZITE.</p> <p>Granite (igneous rock) changes to GNEISS and shale, a sedimentary rock, into the so well known metamorphic rock SLATE.</p> <p>Another very important fundamental fact about these metamorphic changes in rocks is that they all take place essentially in a solid state.</p> <p>The original rocks are heated and compressed but seldom melted. (Once melted and recrystallized, they form igneous and not metamorphic rocks).</p>	
	b) State the importance of frog and draw labeled sketch of conventional brick.	
Ans :	<p>Importance of Frog:-</p> <ol style="list-style-type: none"> 1) It is a depression on the face of the brick made for object of key for mortar between two courses. 2) It is used for indicate the trade name of manufacturer. 3) To save the clay. <p>Conventional brick:-</p>  <p style="text-align: center;">Nominal Size of brick</p>	<p>2M</p> <p>1M sketch & 1M Naming</p>

c)	Distinguish between fat lime and hydraulic lime.			
Ans :	Fat lime	Hydraulic lime		1M each any four
	1) It is obtained from comparatively pure carbonate of lime containing only 5 per cent of clayey impurities.	1) It is obtained from lime stones containing clay to the extent of about 5 to 30 per cent and some amount of ferrous oxide.		
	2) It slakes vigorously. Its volume is increased to about 2 to 2½ times the volume of quick lime. The slaking is accompanied by sound and heat.	2) It slakes slowly. Its volume is slightly increased. The slaking is not accompanied by sound or heat.		
	3) It sets slowly in presence of air. It absorbs carbon dioxide from atmosphere and forms calcium carbonate.	3) It sets under water. It combines with water and forms crystals of hydrated tricalcium aluminate and dicalcium silicate.		
	4) It does not possess hydraulic property.	4) It possesses hydraulic property.		
	5) It is perfectly white in colour.	5) Its colour is not as white as fat lime.		
	6) It is not very strong. Hence it cannot be used where strength is required.	6) It is strong and can therefore be adopted where strength is required.		
	7) It is used for plastering, white-washing, etc. and for preparing mortar with sand or surkhi.	7) It is used for preparing mortar for thick walls, damp places, etc. Extreme care is required to prepare mortar of this lime for plaster work.		
d)	Enlist two properties of glass fibre and plastic fibre.			
Ans :	Properties of glass fibers: (any 2)			2M
	1) High tensile strength 2) High heat resistance 3) Non combustibility 4) Low cost 5) Excellent moisture resistances 6) High heat resistance 7) High young modulus 8) High dimensional stability			
	Properties of Plastic fibres:(any 2)			2M
	1) Softens on heating without any evolution of gas. 2) Softened have good binding property. 3) Superior smoothness and uniformity. 4) Water resistant.			
e)	State any two uses and properties of rubber wood.			
Ans :	Uses of rubber wood:			2M
	1. It has a dense grain that is easily controlled in the kiln drying process. 2. Making it one of the more stable construction materials available for furniture, toys and kitchen accessories.			
	Properties of rubber wood:			2M
	1. It is a light hardwood. 2. It has very little tendency to warp or crack. 3. It has very little shrinkage. 4. Rubber wood-Eco Friendly.			

	5. It is a moderately hard and 'light to moderately heavy' timber with density ranging from 435 to 626 kg/m3 at 12% moisture content																	
f)	State various properties of Asphalt.																	
Ans :	Properties- 1) It is black or brownish black in colour. 2) As temp increase, the bitumen passes from various phase as (Solid) – (Semi-Solid) – (Liquid) – (Vapour) 3) Whereas at temp. Less than 50°C it remains in solid state. 4) It is thermoplastic material. 5) It softens as it is heated. 6) It hardens as it is cooled. 7) It is the tough and durable material. 8) It is a waterproof material and can be easily cleaned. 9) It is the good insulator of electricity, heat & sound. 10) It is affected by acids and is safe against vermin. 11) It is resilient and reasonably elastic. 12) It is soluble in C ₂ S, Benzene, Naptha 13) Setting time: Less	1M each any four																
Q.4	Attempt any FOUR of the following	16M																
a)	State any four characteristics of good tiles.																	
Ans	1. It should be free from any cracks. 2. It should be regular in shape & size. 3. It should be sound, hard & durable. 4. It should have uniform texture & color. 5. It should have low water absorption (less than 15 %). 6. It should be light in weight & easy to handle & transportation. 7. It should have insulation property. 8. It should be well burned, dense, compact 9. It should resist wear and tear and atmospheric action. 10. It should have pleasing appearance. 11. It should be leak proof. 12. It should have sufficient capacity to resist the load.	1M each (any four)																
b)	Enlist the tools and plants required for stone dressing.																	
Ans	<table><tr><td>1. Spall hammer</td><td>9. Drag</td></tr><tr><td>2. Mash hammer</td><td>10. Pitching tool</td></tr><tr><td>3. Scrabbling hammer</td><td>11. Boaster</td></tr><tr><td>4. Wallers hammer</td><td>12. Pointer</td></tr><tr><td>5. Mallet</td><td>13. Punch</td></tr><tr><td>6. Gad</td><td>14. Tooth chisel</td></tr><tr><td>7. Dummy</td><td>15. Drafting chisel</td></tr><tr><td>8. Hand Saw</td><td></td></tr></table>	1. Spall hammer	9. Drag	2. Mash hammer	10. Pitching tool	3. Scrabbling hammer	11. Boaster	4. Wallers hammer	12. Pointer	5. Mallet	13. Punch	6. Gad	14. Tooth chisel	7. Dummy	15. Drafting chisel	8. Hand Saw		½ M each (any eight)
1. Spall hammer	9. Drag																	
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7. Dummy	15. Drafting chisel																	
8. Hand Saw																		
c)	Explain in brief the types of Aggregate.																	
Ans	Mainly two types of aggregates are used in concrete. • Fine aggregate and coarse aggregate. • Sand comes under the category of fine aggregate and crushed stone or metal, called khadi or gitti in Marathi, comes under coarse aggregate. • Maximum size used is 80mm and range 80mm to 4.75mm is known as coarse aggregate and the 4.75 to 150 micron is termed as fine aggregate. • The size 4.75 mm is common to both the fine and coarse fraction.	1 M each																

d)	Explain earthquake engineering and infrastructure development as basic areas in civil engineering.	
Ans	<p>Earthquake engineering-</p> <ul style="list-style-type: none"> • During earthquake, the ground may move horizontally in any direction and up and down, shifting the building foundation correspondingly. This may result the failure of structure, damage to property and loss of human life. • Civil Engineer is the one who deals with the study of zones of probable seismic intensity upon the different area so that any preventive care can be taken against earthquake. • Civil Engineer designs the structural members of the Building to make the building strong. <p>Infrastructure development-</p> <ul style="list-style-type: none"> • Infrastructure development means the provision of good infrastructure facilities which help to develop the rapid growth of a particular area. • Transportation facilities like roads and railways are possible only because of civil engineering. • Construction of dams, harbors, airports etc. is civil engineering activity. • Water supply and drainage facility also comes under civil engineering. This way civil engineering is important in human life. 	<p>1M each (any two)</p> <p>1M each (any two)</p>
e)	State the various tests performed on lime and explain any one of them.	
Ans	<p>Test on Lime:</p> <ol style="list-style-type: none"> 1.Soundness test 2.Transverse strength test 3.Visual test 4.Chemical test 5.Hydraulic acid test <p>Visual test:</p> <p>This test is performed from physical appearance of lime. If color of lime is pure white, it indicates fat lime or pure lime. If color of lime is dirty white, it indicates the presence of impurities. If lime contains lumps, it indicates the quick lime or unburnt lime stone.</p> <p>Hydraulic acid test:</p> <p>(i)Sample of lime powder with a full teaspoon is taken in a test tube containing water (ii)Then this sample is stirred with the help of glass rod and kept for 24hr. After 24hr. if much more efflorescence is observed, then it indicate the high percentage of calcium carbonate and residue at the bottom indicate the presence of inert material (iii)If thick gel is formed, then it indicates that the sample is eminently hydraulic lime. When test tube is tilted, then gel flows which indicate the sample is hydraulic and if gel is not at all formed, then it indicates the sample is non-hydraulic lime or fat lime.</p>	<p>½ M each (any four)</p> <p>2M each (any one)</p>
f)	State any two properties and uses of artificial timber.	
Ans	<p>Properties of Artificial timber:</p> <ol style="list-style-type: none"> 1. It is Eco-friendly. 2. Shrinkage is less. 3. Movement due to changes in moisture is negligible. 4. Resistance to cranking, wrapping. <p>Uses of Artificial timber:</p> <ol style="list-style-type: none"> 1. It is used for building toys. 2. It is used for building furniture. 3. It is used for fancy work. 	<p>1M each (any two)</p> <p>1M each (any two)</p>

Q.5	Attempt any <u>FOUR</u> of the following	16 M
a)	State importance of flooring tiles and roofing tiles in building and mention two names of it.	
Ans	<p>1) Flooring tiles: These tiles have very attractive look and available in various shade of colour. They have very light weight as compare to mosaic tiles or marble or granite. They are scratch proof and anti-slip. Popular names of tiles are ceramic, marbonite, granomite etc.</p> <p>2) Roofing tiles: These tiles are mostly used for covering the pitched roof or slope roof. Various types of roof tiles are available in market in the name of Allahabad tiles, corrugated tiles, Guna tiles, Mangalore tiles, Flemish tiles, Flat tiles, Pan tiles, Pot tiles etc.</p>	<p>2M</p> <p>2M</p>
b)	State any two uses and properties of ferrocrete.	
Ans	<p>Uses of Ferrocrete:</p> <ol style="list-style-type: none"> 1. To produce high early strength in wide variety of concrete. 2. To facilitate the early demoulding, handling and uses of all types of precast concrete products. 3. It reduces formwork stripping time. 4. It helps to maintain normal concrete production during cold weather. <p>Properties of Ferrocrete:</p> <ol style="list-style-type: none"> 1. Composite building material made from combination of concrete and iron. 2. It is high resistive to wear and tear 3. It can be in construction of roads and walkways. 4. It has higher early strength 5. Quick setting 6. Early demoulding, handling and use of precast units 7. More finely grounded than Portland cement 8. Chemically similar to Portland cement 9. Does not contain any added accelerators or admixtures 	<p>1M each (any two)</p> <p>1M each (any two)</p>
c)	Define coir fibres and state any two uses.	
Ans	<p>Coir: It is obtained from coconut tree. It is a natural fibre extracted from the husk of coconut, it is found between the hard, internal shell and the outer coat of a coconut.</p> <p>Uses:</p> <ol style="list-style-type: none"> 1. Brown coir is used in floor mats and doormats brushes, mattresses, floor tiles and sacking 2. The major uses of white coir is in rope manufacturing and fishing nets 	<p>2M</p> <p>1M each</p>
d)	Explain the importance of soil in civil engineering work.	
Ans	<p>Importance of soil in civil engineering work:</p> <ol style="list-style-type: none"> 1. Soil can be used as construction material in civil engineering. 2. Soil can be used as foundation material. 3. Soil is a very useful material in civil engineering. Its easy availability and low cost material. 4. It a very versatile and widely used material for filling, brick manufacturing, roads, etc. 5. The importance of soil is manifold. It can be used in many different ways. 	1M each (any four)

e)	State the various types of glass.	
Ans	Types of glass: 1. Soda lime glass/ Soda ash/Soda glass. 8. Obscured glass-Frosted/Rolled/Ribbed 2. Lead glass/ Flint glass. 9. Laminated glass/ Safety glass. 3. Boro-silicate Glass. 10. Heat absorbing glass. 4. Sheet glass 11. Ground glass. 5. Plate glass 12. Block glass. 6. Tempered glass 13. Opal glass. 7. Wired glass 14. Enamel glass. 15. Optical glass.	1½ M each (any eight)
f)	Explain the suitability of sand, silt and clay in construction work.	
Ans	<p>Sand: Sand can be obtained from the natural river bed. Sand range from 75 micron to 4.75 mm. Now-a-days artificial sand also termed as crushed sand is also being used in various building construction work. Sand is more suitable materials for making mortar and concrete. Hence sand is one of the important ingredients of mortar and concrete.</p> <p>Silt: Silt ranges from 2 to 75 micron. Silt has noticeably lower cohesion than clay. However silt is still very heavily reliant on water content. Silt is suitable for foundation but require compaction. Silt is used for manufacturing of brick, construction of roads.</p> <p>Clay: Clay has particle size less than 2 micron Clay is more suitable in embankment fills and water storage pond beds. Clay is also suitable for foundation but require compaction. Clay provides the moderate supports. Clay is used for manufacturing bricks, Tiles, Construction of roads.</p> <p>Note:- Student may write any other suitability point than above mentioned. So accordingly credit to be given</p>	1 ½ M 1M 1 ½ M
Q.6	Attempt any <u>FOUR</u> of the following	16 M
a)	State any four brand names of waterproofing and damp proof material.	
Ans	1. Ridex AP 11. Ridex flexifil 2. Ridex weather safe 12. Polysil C 3. Ridex WR 13. Conpro WP-2 4. Ridex OR 14. Hydroproof-IWL 5. Water repellent 15. BASF India ltd 6. Ridex seal 16. Impermo 7. Wall plast 17. Waterseal 1 8. Ridex ACR 18. Sunanda chemicals 9. Dr. fixit 19. Krishna conchem 10. Algahard-x	1½ M each (any eight)
	NOTE-Students can write any four names as waterproofing brand and four names as damp proofing brand.	
b)	Enlist four properties of linoleum.	
Ans	1. It is a heat insulating material 2. It has Abrasion resistance property 3. It is free from fire hazard 4. It has good water proofing property 5. very durable and flexible	1M each (any four)

c)	Define rubber waste and give any three uses of it.	
Ans	<p>Rubber Waste: The use of rubber in so many applications like automotive, building various industries etc results in growing volume of waste known as rubber waste.</p> <p>Uses of Rubber Waste</p> <ol style="list-style-type: none"> 1. Used for erosion control 2. Manufacturing of floor mats 3. By grinding tyres into crumb and using it in asphalt mix 4. Used in core of earthen embankments 5. It is used in manufacturing of foam rubber which is used in furniture 6. By grinding tyres into crumb and using it in asphalt mix 	<p>1M</p> <p>1M each (any three)</p>
d)	<p>State the application of following material:</p> <ol style="list-style-type: none"> (i) Jute (ii) Artificial timber (iii) Epoxy (iv) Geonet 	
Ans	<p>Application of jute:</p> <ol style="list-style-type: none"> 1. Construction site compounding, scaffold tying, privacy screens 2. Reinforcement material, in stucco work 3. Insulation material. 4. Jute is used chiefly to make cloth for wrapping bales of raw cotton and to make sacks and coarse cloth. <p>Application of Artificial timber:</p> <ol style="list-style-type: none"> 1. It is used for building toys. 2. It is used for building furniture. 3. It is used for fancy work. <p>Application of Epoxy:</p> <ol style="list-style-type: none"> 1. In paints and powder coatings for metal surfaces. 2. As adhesives for wood, metals, glass, stones and plastics. 3. In industrial fooling. <p>Application of Geonet:</p> <ol style="list-style-type: none"> 1. Erosion control: ribs act as small check dams to slow down the surface runoff decreases erosion potential of water. 2. Drainage layers: Water flows along the geonet because of large thickness. 3. Protection from landslide: With the help of geonet the stability of slopes can be improved 	<p>½ M Each (any 2 EACH)</p>
e)	Define “mortar”. Enlist various types of mortars with their use (any two)	
Ans	<p>Mortar: When the building materials such as cement or lime is mixed with inert materials like sand, cinder or surkhi and water in appropriate proportion then a paste is formed which is called as mortar.</p> <p>Types of Mortar with their use:</p> <ol style="list-style-type: none"> 1. Cement Mortar: Cement mortar is used for plastering of stone and brick masonry. 2. Lime Mortar: Used for plastering of stone and brick masonry. 3. Hydraulic Mortar: For plastering surfaces of various vessels for liquid products, walls of surfaces of basements, which are made with Portland cement, sulphate resistant Portland cement and waterproofing expanded cement. 4. Insulating Mortar: To increase the thermal insulation, various compacting admixtures such as sodium aluminate, emulsified asphalt and latexes are added to the mixture. 5. Injection Mortar: For filling grout are intended to fill channels in pre-stressed 	<p>2M</p> <p>1M each (any 2)</p>

	<p>constructions for protection of reinforcement against corrosion.</p> <p>6. Acoustic Mortar: Used for making sound proofing plasters.</p> <p>7. X-ray Shielding Mortar: This type of mortar is used for providing the plastering coat to walls and ceiling of X-ray cabinets.</p>	
f)	State any two uses and properties of arecanut trunk.	
Ans	<p>Uses:</p> <ol style="list-style-type: none"> 1. The trunks of trees are used for crude construction. 2. The leaves of trees provide a source of construction material, either split or whole. 3. They are used for rafters and for wattle in house construction. <p>Properties:</p> <ol style="list-style-type: none"> 1. Chemical composition consists of lignin, cellulose and pentogent. 2. Trunks are salt resistant. 3. Strong and durable. 	<p>1M each (any 2)</p> <p>1M each (any 2)</p>