SUMMER – 14 EXAMINATIONS

Subject Code: 17209 **Model Answer** **Total Pages: 14**

Important Instruction to Examiners:-

1) The answers should be examined by key words & not as word to word as given in the model answers scheme.

2) The model answers & answers written by the candidate may vary but the examiner may try to access the understanding level of the candidate.

3) The language errors such as grammatical, spelling errors should not be given more importance.

4) While assessing figures, examiners, may give credit for principle components indicated in the figure.

The figures drawn by candidate & model answer may vary. The examiner may give credit for any equivalent figure drawn.

5) Credit may be given step wise for numerical problems. In some cases, the assumed contact values may vary and there may be some difference in the candidate's answers 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.

7) For programming language papers, credit may be given to any other programme based on equivalent concept.

SUMMER – 14EXAMINATION

Subject Code: 17209 Model Answer Page No: 01/14

Q .NO	SOLUTION	MARKS
Que.1	**Attempt any ten.**	20M
a.	**Define Environmental Engineering**. Environmental Engineering is a branch or basic area of the civil engineering which deals with water supply, disposal of waste water from domestic & industrial use & environmental pollution control.	2M
b.	**List any four types of common stones used in building construction.** 1. Basalt , 4. Kota, 7. Dolerite, 2. Granite, stone, 5. Laterite, 8. Lime 3. Marble, 6. Kadappa , 9. Shahabad.	½ mark for each (any four)
c.	**Define Soil.** The loose, unconsolidated, inorganic material on the Earth's crust produced by the disintegration of rocks, overlaying hard rock with or without organic matter is known as 'soil'.	2M
d.	**Give any four uses of lime.** 1. It is commonly used in Neeru finish work. 2. It is used for making mortar. 3. It is used for soil stabilization. 4. It is used for final coat in internal plastering work of wall & ceiling. 5. It is used to manufacture lime sand bricks. 6. It is used in manufacturing of glass. 7. It is used for making cement. 8. It is used as a refractory material for lining open earth furnaces.	½ mark for each (any four)
e.	**Give two advantages of pre-cast concrete blocks.** 1. It has high quality, high strength, uniform shape & size. 2. It is totally energy efficient. 3. They are eco-friendly. 4. Machine production provides smooth finish. 5. They are durable & economical. 6. These blocks can be made in any design & desired shape & size.	1 mark for each (any two)

Q .NO	SOLUTION	MARKS
f.	**Give any two characteristics of good tiles used for wall cladding.** 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.	1 mark for each (any two)
g.	**What do you mean by 'Hydration of cement'?** Cement gains its strength through a chemical reaction with water, this reaction is known as 'hydration'.The reaction by which cement acts as bonding agent is called as 'hydration of cement'.This binding action takes place in the presence of water.	2M
h.	**List any four thermal insulating materials.** 1. Rock wool blankets 2. Fibre board 3. Flexible glass 4. Saw dust 5. Wood shavings 6. Foam board slabs 7. Foam plastic 8. Thermocol 9. Cork board slabs 10. Mineral wool slabs 11. Aluminium foil 12.Gypsum boards 13. Asbestos cement boards	½ mark for each (any four)
i.	**Give any four units where sound insulation is necessary.** 1. Libraries 2. Theatre 3. Auditorium 4. Recording rooms 5. Restaurant 6. School 7. Health care Centre.	½ mark for each (any four)

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Subject Code: 17209 **Model Answer** **Page No: 03/14**

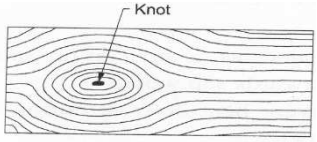
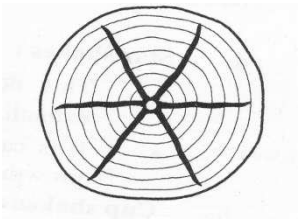
Q .NO	SOLUTION	MARKS
j.	**List four types of fibers.** 1. carbon fibers 2. Glass fibers 3. Plastic fibers 4. Asbestos fibers 5. steel fibers 6. Jute fibers 7. Coir fibers	½ mark for each (any four)
k.	**What is Enamel paint?** The paints which consists metallic oxide ground with a small quantity of soil & mixed with petroleum spirit holding resinous matter in solutions, are called as 'Enamel paint'.	2M
l.	**Give any four properties of plastic paint.** 1. Quick drying paint. 2. High covering power. 3. Decorative appearance. 4. These paints afford good adhesion to the surface being painted.	½ mark for each (any four)
m.	**Define straw. Give its one use in building construction..** Straw :- The dry stalks of cereal plants after the grain & chaff have been removed are called as straw. Uses of straw:- 1. To build straw bale houses. 2. Straw ash is used for manufacturing bricks. 3. Straw ash is used for manufacturing light weight mortar & concrete.	1M 1M (any one)
n.	**Give any two uses of Granite & marble polishing waste.** 1. It is used as aggregates in mortar & concrete. 2. It is used for manufacturing bricks. 3. It is used in manufacturing of artificial stones. 4. It is used in manufacturing of paving blocks.	1 mark for each (any two)

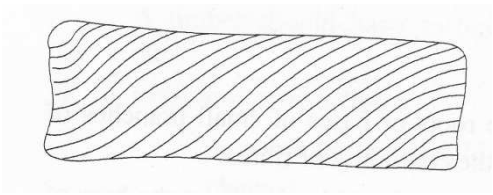
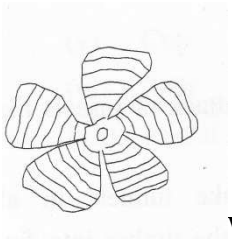
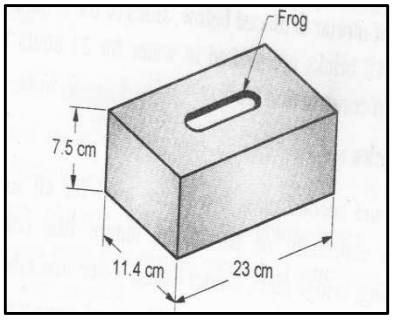
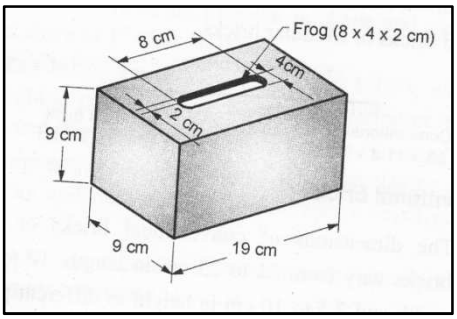
Q .NO	SOLUTION	MARKS
2	**Attempt any four.**	16M
a.	**Give any four properties of eco-friendly materials.** 1. It is bio-degradable. 2. It is renewable source. 3. It is reused & recycled. 4. It increases durability & life span of living bodies. 5. It aids energy efficiency in building. 6. It reduces air pollution, land pollution & water pollution. 7. It is locally available.	1 mark for each (any four)
b.	**Describe four steps in operation of stone blasting.** 1. Drilling holes- Holes are drilled up to required depth of the line of least resistance manually by means of a knife edged steel bar called as jumper or by rotary drilling machine. 2. Charging:- After drilling, the holes are cleaned & allowed to dry. Then gun powder or dynamite or blasting gelatin or any other suitable explosive is inserted into the drilling hole along with fuse. 3. Tamping:- After charging the hole by the explosive powder, the remaining portion of hole is filled with clay or ash & compacted with the help of tamping bar. 4. Firing:- For the purpose of firing, a fuse is already inserted throughout the hole. The free end of fuse is finally fired either with a match or electricity. Note that, detonators are being used for firing if dynamite is used as explosive. After blasting, disintegrated blocks of stones are collected & transported to the required site under construction.	4M

Q .NO	SOLUTION	MARKS
c.	**Give any four field tests for selection of burnt clay bricks.** 1. Uniformity in shape & size:- A good brick should have rectangular plane surface & uniform in size. 2. Uniformity in colour:- A good brick will have uniform colour throughout. 3. Structure:- Few bricks may be broken in the field & their cross section is observed. The section should be homogeneous, compact &free from defects like holes & lumps. 4. Sound test:- If two bricks are struck with each other they should produce clear ringing sound. 5. Hardness test:- Scratch the brick with nail, if no impression is marked on the surface, the brick is sufficiently hard. 6. Impact test:- Drop a brick from the height of about 1m, if brick breaks then it is not strong enough.	1 mark for each (any four)
d.	**Give the list of any four brands of water proofing materials available in market with use of each.** 1. Ridex AP:- For water proofing of cementatious surface. 2. Ridex weather safe:- Water proofing of any masonry surface, RCC slab,china mosaic & IPS plaster. 3. Ridex WR:- It can be applied on walls either plastered or not. 4. Ridex OR:- For water proofing at door steps. 5. Water repellent :- Applied on concrete, stone, plastered surface. 6. Ridex seal:-Concrete surface either plastered or not. 7. Wall plast:- Applied on almost all interior surface. 8. Ridex ACR:- Ideally suited to improve new & old plaster & crack filling application.	1 mark for each (any four)

Q .NO	SOLUTION	MARKS
e.	**Give definition, proportion, properties &uses of 'fire resistant mortar.'** Definition :- The type of mortar is prepared by adding aluminous cement to the fine crushed powder of fire bricks is known as fire resistant mortar. Proportion :-It is prepared by adding 1 part of aluminous cement & 2 parts of finely crushed powder of fire brick. Properties :-It has good resistance to fire along with regular required properties of mortar. Uses :- It is used with fire brick for lining furnaces, fire places, ovens	 1M 1M 1M 1M
f.	**How fly ash is useful as a construction material?** 1. Concrete production, as a substitute material for Portland cement & sand. 2. Embankments & other structural fills. 3. Grout &flowable filled production. 4. Waste stabilization & solidification. 5. Cement clinkers production. 6. Mine reclamation. 7. Stabilization of soft soil. 8. Road sub base construction. 9. As aggregate substitute material. 10. Brick production.	 1 mark for each (any four)
Q.3)	Attempt any four	16
a)	1. Priscribed load 2. Serviceability 3. Asthetically pleasing 4. Economical 5. Environmental Friendly	1 mark for each (any four)
b)	Purpose of seasoning: 1. To reduce weight of timber with a view to reduce cost of handling and transport. 2. To bring moisture level at a particular percentage with a view to easy conversion. 3. To make it structurally stable 4. To make it resistance to decay. 5. To impart strength, hardness and toughness	1 mark for each (any four)

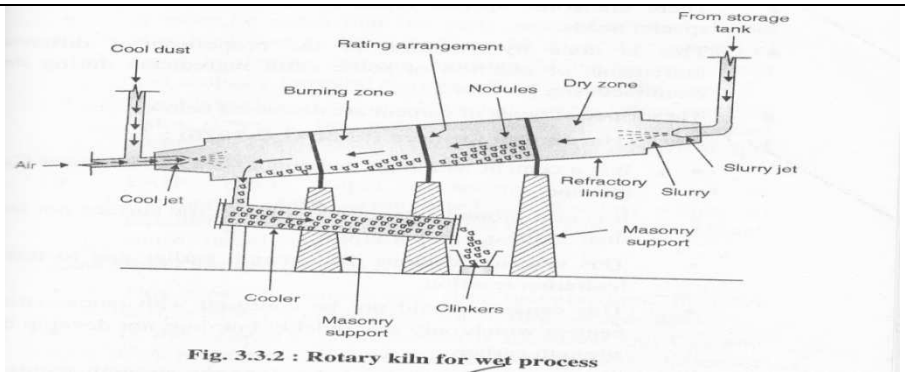
Q .NO	SOLUTION	MARKS
c)	1. It is mostly solid or semi- solid available in state 2. It is completely soluble in carbon-bisulphate(cs_2) 3. It is black or brownish black in colour 4. It has adhesive properties when comes in contact with heat. 5. When heated, it undergoes melting and gives distinctive odour	1 mark for each (any four)
d)	Wall Cladding: Wall cladding is a process of finishing the surface with tiles. Process: 1. Firstly plaster the wall with lime morter 2. Take the tiles which are immersed in water for one hour and that are covered with a paste of cement on back 3. Laid the tiles flat against the wall surface true to line and plumb 4. Pressed this tiles with light strokes of a wooden mallet 5. The joints should be as thin as possible	1M 3M
e)	Classification of Cement: 1.Natural cement 2. pozzolonic cement 3. High alumina cement 4.Portland cement 5. Super sulphate cement 6. Special sulphate cement	1 mark for each (any four)
f)	i) Size : The largest size which comes under the range of fine aggregate is 4.75mm ii) Shape : sand of irregular nodular shape is preferable to completely round grained sand iii) Specific gravity : 1. Specific gravity of aggregate is the ratio of its density to the density of water 2. Generally it is taken as 2.7 iv) Bulk density : The bulk density of fine aggregate falls between 17 to 25 KN\m^3	1 mark for each

Q .NO	SOLUTION	MARKS
Que. 4		16M
a)	Transportation Engineering : Transportation Engineering is a branch of civil engineering which deals with design, development, construction and maintenance of roadways, railways, airports, harbours, docks, tunnel and bridges. Rapid Hardening cement : It is cement with high percentage of c_3s and lower c_2s content. This cement develops the strength earlier due to faster hydration reaction. This cement develops the strength within 3 days which is equal to the strength developed by OPC after 7 days.	2M 2M
b)	1. Knots: i. The formation of dark and hard rings at the base of branches is called as Knots ii. It breaks the continuity of fibers  2.Heart Shakes: i. This defect is produced in heart wood and it arises when the tree is remained unfilled after the age of maturity ii. This defect caused due to shrinkage of heartwood  Heart Shakes 3.Twisted Fibers: i. This defect is raised due to constant bending in	1M 1M 1M

Q .NO	SOLUTION	MARKS
	i. one direction because of wind action and fibers are twisted longitudinally ii. It is used for post or props or poles in unsawn condition itself or for fuel purposes  Twisted Fibres 4.Wind cracks: This defects raised due to shrinkage of exterior surface exposed to atmospheric agencies like wind, sun, snow.  Wind cracks	1M 1M
c)	i) Conventional brick: :  ii) Standard brick: 	2 marks for each

d)	List of four harmful constituents of bricks: 1. Lime stone and kankar nodules 2. Alkalies 3. Iron pyrites 4. Pebbles of stone and gravel 5. Organic matter or vegetation How they are harmful: 1. Lime stone and kankar nodules: It causes the bricks to split into pieces 2. Alkalies : If alkally contain bricks are used in masonry work, it absorb moisture from the air and causes efflorescence i.e. grey or white deposits on the wall surface, hence affects on the overall appearance of building. 3. Iron pyrites : If iron pyrites present in bricks earth, then this bricks are decomposed or disintegrated and crystallized during burning process 4. Pebbles of stone and gravel: The presence of pebbles of stone and gravel are harmful since it prevents thorough mixing and uniformity of a brick. 5. Organic matter or vegetation: If presence of organic matter or vegetation in brick earth is not completely burnt, then brick becomes more porous.	1 mark for each (any four)

Q .NO	SOLUTION	MARKS
e)	characteristics of good tiles: 1. Tile should have no cracks or bends 2. It should be well burned, dense, compact 3. It should be regular in size and shape 4. It should be uniform in colour and should resist wear and tear and atmospheric action.	1 mark for each (any four)
f)	Requirements of good 'Damp proofing Material': 1. It should impervious 2. It should be flexible 3. It should be easy to carry out leak proofing joints 4. It should be stable and durable 5. Materials must be able to withstand dead as well as live loads without damage 6. It should be free from salts like sulphates, chlorides and nitrates	1 mark for each (any four)
Que.5	Attempt any Four.	16M
a)	Advantages of Dressing of Stones: i. It gives the required shape to the quarry stones. ii. It improves the appearance of stone surface. iii. It reduces the width of mortar, thus it achieve economy. iv. It also reduces the weight of stones and handling costs.	1 mark for each (any four)
b)	Hollow concrete block masonry is used: i. For exterior load bearing walls. ii. For interior walls. iii. For panel walls iv. For Columns, retaining walls v. For compound walls.	1 mark for each (any four)
c)	Meaning of: i. Igneous Rocks: Rocks formed by cooling and consolidation of molten rock matter called as magma are called as Igneous rocks. ii. Sedimentary Rocks: Because of weathering action such as rain water, wind, snow, sunrays, etc. the primary rocks	1 mark for each (any four)

Q .NO	SOLUTION	MARKS
	are broken up and gradually get deposited at the bottom of river or sea. Thus the formation of rock after the age is called as sedimentary rocks. iii. Metamorphic Rocks: These are the rocks which are formed igneous and sedimentary rocks under the influence of temperature, pressure, and chemical environment. iv. Argillaceous Rocks: These rocks are composed of alumina and small quantities of siliceous and calcareous materials.	
d)	 **Fig. 3.3.2 : Rotary kiln for wet process**	4M
e)	Termite proofing materials: i. EPS sandwich panels Uses: a. Interior and exterior partition on steel or concrete b. For various buildings like banks, offices, hospitals, schools, hotels, etc. ii. Termite resistance wood plastic composite floor Uses: a. Used for outside walls b. Used for decking board iii. Taixi wood Uses: a. Used in offices, hotels, public buildings, commercial premises iv. Termotar: uses : a.Termortar used in brickwork construction	1 mark for each (any four)

Q .NO	SOLUTION	MARKS
f)	Properties of Acoustic plaster: I. Excellent sound proofing property. II. It should be tough, hard, durable and economical. III. It should be workable so as to have good adhesion with stone. IV. It should be capable to resist the weathering effect. Uses of Acoustic plaster: a. It is used for construction of sound proof building. b. Asthetic purpose	2M 2M
Que. 6	Attempt any Four	16M
a)	Requirements of good building stone: i. It should have high crushing strength more than 100 N/mm^2 ii. It should have high durability. iii. It should have equigranular structure. iv. It should have high specific gravity ranges from 2.4 to 2.8 v. It should have low water absorption. vi. It should have better appearance and color. vii. It should be polished properly. viii. It should have high impact value.	1 mark for each (any four)
b)	Uses of asbestos fiber as construction material: i. When mixed with cement, asbestos cement products are prepared like sheets and pipes. ii. Asbestos sheets are used as roofing materials. iii. Asbestos pipes are used to convey rain water, seepage water, etc. iv. It is also used as good heat and electricity insulator.	1 mark for each (any four)
c)	Properties of Ferrocrete: i. Chemically similar to Portland cement ii. More finely ground iii. Color similar to Portland cement iv. Does not contain any added admixture Uses of Ferrocrete: i. To produce high early strength in wide variety of concrete. ii. To facilitate the early demoulding, handling and uses of all types of precast concrete products.	2M (any two) 2M

Q .NO	SOLUTION	MARKS
d)	Procedure of fixing Linoleum to floor: Step1 : Remove the dirt and debris from underneath the area that needs to fixed. Step2 : Place a line of liquid nails along the edge of the tear or the area that needs repairing. Push back into place and remove any excess adhesive with a rug. Step3 : Place a heavy flat object over the sheet. Allow the area to dry. Step4 : Apply seam sealer to keep dirt and debris away from working underneath floor. Step5 : Clean and maintain the flooring as recommended by the manufacturer.	4M
e)	Uses of Risk husk: i. In manufacturing of bricks. ii. In thermal insulation of building, rice husk is used. iii. The ash produced after burning of rice husk is used in production of aggregates and fillers for concrete and board. iv. Used in generation of heat energy, steam energy and electricity generation.	1 mark for each
f)	Saw dust: A by product of cutting, grinding, drilling or otherwise pulverizing wood with a saw or other tool is called as a saw dust. Properties of Saw dust: i. It composed of fine particle of wood. ii. It consists of cellulose. iii. It is combustible dust. iv. It consists of fatty acids.	1M 1M (any three)