Name.....

Reg.No.....

COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)

DEGREE EXAMINATION, MAY 2015

EN 14 106: BASICS OF CIVIL AND MECHANICAL ENGG.

Time: 3hrs Maximum: 100 Marks

Section 1.CIVIL

PART A

Answer any four

1. What are the main components of building?
2. What are the quality requirements for aggregates?
3. Draw the plan of English bond for the corner of a brick wall of one and half brick thick.
4. Give classification of surveying based on instruments used.
5. Explain indirect ranging.

(4x5=20 Marks)

PART B

Answer All

6. What is seasoning of timber? Describe its objectives and the different methods of seasoning.

OR

7. Explain the properties and applications of
   a) Cement mortar
   b) Concrete

8. Explain about the classification of foundation

OR

9. The following readings are taken on a level instrument with the station A as a benchmark with RL.100m.The instrument is shifted after 4^{th} and 7^{th} readings. Readings are 1.200, 0.980, 1.035, 0.650, 1.100, 0.950, 0.700, 1.400, 1.000 and 0.880.Book these readings in the field book and find out the reduced level.

(2x15=30 Marks)

EN 14 106 BASICS OF CIVIL & MECHANICAL ENGG.

Answer key

SECTION 1. CIVIL

PART A

(1) Foundation, Basement, plinth, Floor concrete, wall, door, lintel, column, Beam, Roof, parapet, weathering course. — (3 marks)

For sketch — (2 marks).

(2) The properties are,

a) It should be hard, strong and durable, free from coating.

b) It should not react with cement or steel.

c) It should consist of natural stones, gravel and sand or in various combinations of these materials.

d) Porosity should be limited.

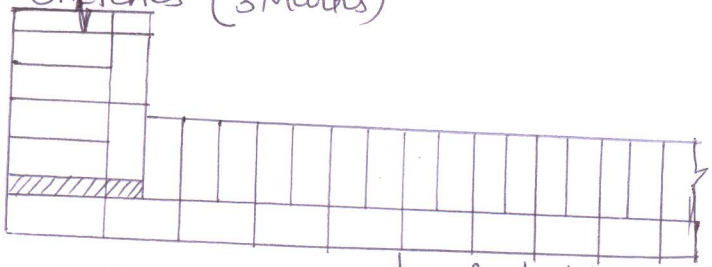
e) It should be angular in shape, having rough surfaces.

f) Free from organic and deleterious substances like coal, mica, Iron pyrates, shale, clay etc.

g) It should have low thermal conductivity. (Give 5 marks if all the points are Listed out)

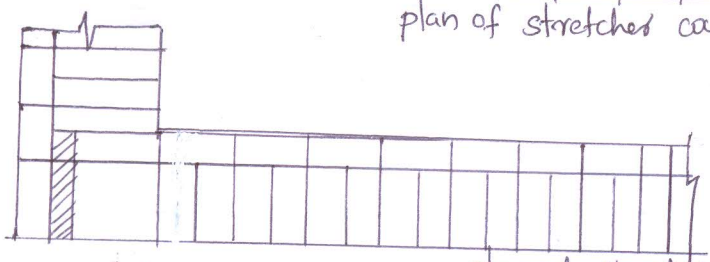
(3) Explanation about the bond and the characteristics (1½ marks)

Sketches (3 Marks)



plan of stretcher course.

(2 mark)



Plan of Header course.

(2) mark.

④ classification of surveying based on Instruments used.

1. chain Surveying
2. Compass Surveying
3. plane Table Surveying
4. Levelling
5. Theodolite Surveying
6. Tacheometric surveying
7. Total station surveying
8. photogrammetric surveying — (5 marks)

⑤ Explanation — 3 marks

* Used when intermediate points are not visible.
* procedure for Reciprocal Ranging.

Figure — 2 Marks.

PART-B

⑥ The process of drying of timber is known as Seasoning of timber. The fresh timber contains 50% or more of its own dry weight as water. The water should be removed before engineering purposes. — (2 Marks)

objectives — (5 Marks)

Methods of seasoning

1. Natural
2. Artificial

Explanation, Procedure — (8 Marks.)

⑦ (a) properties of cement Mortar

good adhesion, water penetration, workable, durable, inert, joints should be strong, cost effective. — (3 Marks)

Applications — plastering, Improves appearances, Moulds, stonework can be hidden, cracks can be detected. (3 Marks)

(b) concrete.

properties — plasticity, compressive strength, abrasion resistance, easy Transportation, easily pumped, Hardens with age. —(3 Marks)

Applications — construction of Buildings, bridges, Arches, piles pre cast products, culverts, Retaining walls, Floorings, foundation, walls. —(3 Marks)

(8) classification of Foundation.

General classification < shallow foundation $Df < B$
Deep foundation $Df > B$.

shallow Foundation

a) Isolated or column footing.
b) wall or strip footing
c) combined footing
d) continous footing
e) cantilever footing.
f) Inverted arch footing.
g) Grillage footing.
h) Raft or Mat foundation.

Explanation with sketches - 6 Marks.

Deep foundation.

a) pile foundation
b) well foundation.

Explanation with sketches — 6 Marks.

(9) Readings 1.200, 0.980, 1.035, 0.650, 1.100, 0.950, 0.700, 1.400, 1.000, and 0.880.

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Station	B.S	I.S	F.S	H.I	R.L	Remarks.
A	1.200			101.200	100.000	B.M
B		0.980			100.220	
C		1.035			100.165	
D	1.100		0.650	101.65	100.550	change point
E					100.700	
F	1.400		0.700	102.35	100.95	change point
G		1.000			101.35	
H			0.880		101.47	
Sum	3.700.		2.230			

$\Sigma B.S = 3.700$ $\Sigma F.S = 2.230$

$\Sigma BS - \Sigma F.S = 3.700 - 2.230 = 1.470$

Last R.L − First R.L $= 101.47 - 100.00 = 1.470.$

$\Sigma BS - \Sigma F.S =$ Last R.L − First R.L

The elevation difference b/w A & B is 1.470m