

**M.E.CONSTRUCTION ENGINEERING FIRST YEAR FIRST SEMESTER - 2018****SUBJECT : REPAIR MATERIALS FOR MASONRY AND CONCRETE STRUCTURES**

Time : Three hours

Full Marks : 100

50 marks for each part

No of Questions	Part I	Marks
Q1	<p>Answer any <b>four</b> questions.</p> <p>The final mix proportions (quantities) per m<sup>3</sup> of concrete before moisture correction from a mix design are as follows.</p> <p>Cement : 400 kg</p> <p>Water :160 kg</p> <p>Coarse Aggregate: 1223 kg</p> <p>Specific gravity of cement, Coarse and Fine Aggregate are 3.15, 2.90 and 2.66 respectively. Calculate the quantity of fine aggregate per m<sup>3</sup> of concrete.</p> <p>Specific gravity of Napthalene based super plasticizes is 1.15.</p> <p>Super plasticizer doze is 0.8% by weight of cement</p> <p>Moisture absorption of coarse Aggregate : 1.5%</p> <p>Moisture absorption of fine Aggregate : 2.0%</p> <p>On a particular day, the moisture content of coarse aggregate is 1% and fine aggregate is 3%. Find out the quantities of different ingredients per m<sup>3</sup> of concrete after moisture correction.</p>	12.5
Q2.	Describe the various uses of epoxy compounds.	12.5
Q3.	Briefly discuss the use of silica fume in concrete.	12.5
Q4.a)	What is self-compacting concrete?	2.5
Q4.b)	Write a short note on "Passing Ability" of self-compacting concrete.	10
Q5.	Write a short note on Accelerating admixture	12.5
Q6.a)	Briefly discuss the "balling effect" in fiber reinforced concrete.	6.5
Q6.b)	What are the different modes of transportation of harmful ingredients into concrete ?	06
Q7.	Briefly discuss the principles of polymer modifications of hydraulic cementitious system.	12.5

## PART-II

## M.E. Construction Engineering - First Year - First Semester

Answer question number Q- I and any two from the rest.

## Q-I

1. Slaking of lime refers to:
  - a) Mixing NaCl in hydraulic lime
  - b) Mixing water in quick lime
  - c) Mixing water in limestone
  - d) Mixing NaCl in quick lime
2. The first used Mortar was a) Lime mortar b) Mud mortar c) Cement mortar d) Organic mortar
3. Lime obtained from calcination of Pure Limestone is called:
  - a) Quick Lime
  - b) Pure Lime
  - c) Lean Lime
  - d) Rich Lime
4. MM 1.5 means
  - a) Masonry Mortar of cement content 1.5 bags
  - b) Mild Mortar of cement content 1.5 bags
  - c) Masonry Mortar of compressive strength  $1.5\text{N/mm}^2$ .
  - d) Mild Mortar of compressive strength  $1.5\text{N/mm}^2$ .
5. For pointing works, the ratio of mortar used is:
  - a) 1:3 – 1:4
  - b) 1:2 – 1:3
  - c) 1:7 – 1:8
  - d) 1:5 – 1:6
6. Light weight mortar is prepared by using:
  - a) Lime
  - b) Surkhi
  - c) Saw dust
  - d) Flyash
7. Packing mortars are used to pack:
  - a) Oil wells
  - b) Retaining walls
  - c) Bricks
  - d) Cracks in masonry

8. The setting speed of mortar can be increased using:

- a) Lime
- b) Sulphur
- c) Pozzolana
- d) Gypsum

9. Which of the below mortar can settle under water?

- a) Hydrolytic
- b) Pozzolana
- c) Lime
- d) Flyash

10. Which of the below is added to make mortar fire proof?

- a) Gypsum
- b) Asbestos cement
- c) Powdered glass
- d) Aluminous cement

Q-II (a) Explain why Cold mix asphalt may be considered as an effective repair material. (8)

(b) Describe the disadvantages of cold mix asphalt. (5)

© Briefly describe the significance of cement treated base in relation to repair of bituminous pavement. (7)

Q-III (a) Classify hydraulic lime and Fat lime in terms of their gain in strength. (8)

(b) Explain why cement mortars are not usually considered as a substitute repair material in old masonry structure. (12)

Q-IV (a) What are the most important requirements of lime cement mortars? (5)

(b) Classify different type of lime cement mortars and specify the preferred area of application. (7)

© Explain the factors which affect the durability of mortars in masonry bridges. (8)