

Subject: Engineering Materials, Construction and Services

Paper/Code No. CE 302

(i) Use separate answer script for each half

Branch: Civil Engineering

(ii) Assume data reasonable if not supplied

Full Marks: 70

Time : 3 hours

FIRST HALF

(Answer Q.No.1 and any **Two** from the rest)

Q.1. Write short notes on any **FIVE**

- (a) Fire clay; (b) Hypabyssal rock; (c) Silt; (d) Efflorescences; (e) Modular brick;
(f) Colluvial soil; (g) Slaking of lime; h) Transported soil; (i) Frog.

$$5 \times 2 = 10$$

Q.2. Differentiate between

- (i) Rectangular footing and Strip footing;
(ii) Sand and Clay;
(iii) Pier foundation and Well foundation;
(iv) Combined footing and Raft foundation;
(v) Friction pile and End bearing pile.

$$5 \times 2 \frac{1}{2} = 12 \frac{1}{2}$$

Q.3. (a) Briefly describe the wet processes of manufacturing of Ordinary Portland Cement.

(b) Enumerate the classification of lime and discuss briefly the main characteristics of each of them.

(c) What are the uses of pond ash?

$$5 \frac{1}{2} + 4 + 3 = 12 \frac{1}{2}$$

Q.4. (a) What is mortar? Describe the various types of mortars.

(b) State the functions of sand, surki and water in mortar.

(c) What do you mean by seasoning of timber? Describe briefly the method of timber preservation.

d) Explain the following defects of timber.

(i) Star shake; (iii) Knots.

$$3 + 2 + 4 \frac{1}{2} + 3 = 12 \frac{1}{2}$$

SECOND HALF

(Answer Q.No.5 and any Two from the rest)

Q.5. Write short notes on any FIVE

- (a) Chute; (b) Flemish bond; (c) Trap; (d) Ground Floor ; (e) Buffer of a lift; (f) Header bond; (g) Foam based firefighting system; (h) Compressor in Air-conditioning; (i) Bevelled closer.

$$5 \times 2 = 10$$

Q. 6. Differentiate between:

- (a) Fire Reservoir and Ordinary Water Reservoir;
(b) Hospital Lift & Passenger Lift;
(c) Floors and Floorings;
(d) Soil pipe and Vent pipe
(e) Rubble Masonry and Ashlar Masonry

$$5 \times 2 \frac{1}{2} = 12 \frac{1}{2}$$

- Q. 7. (a) What is sewage? Explain partially ventilated single stack system in a multistoried building.
(b) Describe the principles of Air-conditioning System with the help of a line diagram.
(c) Calculate the water demand per day of a housing project to be done on 10 cottah of land on the basis of the following data:
FAR = 2; Type of housing = LIG; SBUA factor= 20%, assume all other required data.

$$4 + 4 + 4 \frac{1}{2} = 12 \frac{1}{2}$$

- Q. 8. (a) Calculate the cost of installation of an Electrical Sub-station in a housing project to be constructed on 10,000 sq ft. of land on the basis of the following data: FAR = 2; Type of housing = HIG; SBUA factor= 20%; Cost of Installation of Electrical Sub-station = Rs. 6000/- per KW. Assume all other required data.

(b) Explain any two of the following with the help of a line diagram

- (i) Lift Pit, (ii) Lift Well, (iii) Lift Machine Room, (iv) Travel, (v) Lift Car

- (c) What is the significance of bonding of brickwork? Draw plan of $1 \frac{1}{2}$ brick thick wall by English bond.

$$4 + 4 + 4 \frac{1}{2} = 12 \frac{1}{2}$$

