

B.Tech.

(SEM. III) ODD SEMESTER THEORY
EXAMINATION, 2015-16

BUILDING MATERIALS AND CONSTRUCTION

Time : 3 Hours

Total Marks : 100

Section - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short : $(10 \times 2 = 20)$

a. Explain the term lime bursting.

Ans. Refer Q. 1.28, 2 Marks Questions, Page SQ-6C, Unit-1.

b. What do you mean by seasoning of timber ?

Ans. Refer Q. 1.29, 2 Marks Questions, Page SQ-6C, Unit-1.

c. Explain the term HVAC.

Ans. Refer Q. 1.30, 2 Marks Questions, Page SQ-6C, Unit-1.

d. Give the classification of plastics.

Ans. Refer Q. 2.3, 2 Marks Questions, Page SQ-8C, Unit-2.

e. Draw a sketch showing the position of gable and dormer window.

Ans. Refer Q. 4.20, 2 Marks Questions, Page SQ-18C, Unit-4.

f. Explain the term 10WS12.

Ans. Refer Q. 4.19, 2 Marks Questions, Page SQ-18C, Unit-4.

g. Enlist the importance of hollow block construction.

Ans. Refer Q. 3.26, 2 Marks Questions, Page SQ-15C, Unit-3.

SP-12 C (CE-Sem-3)

Solved Paper (2015-16)

h. What do you understand by workability of concrete ?

Ans. Refer Q. 1.31, 2 Marks Questions, Page SQ-6C, Unit-1.

i. What do you understand by king closer and queen closer ?

Ans. Refer Q. 1.32, 2 Marks Questions, Page SQ-6C, Unit-1.

j. What do you understand by masonry construction ?

Ans. Refer Q. 3.18, 2 Marks Questions, Page SQ-14C, Unit-3.

Section - B

Attempt any five questions from this section. $(5 \times 10 = 50)$

2. Enlist the various types of doors and explain in detail any four of them.

Ans. Refer Q. 4.3, Page 4-4C, Unit-4.

3. Explain the three commercial form of iron products.

Ans. Refer Q. 2.16, Page 2-17C, Unit-2.

4. Explain how post-construction anti-termite treatment is carried out in a building ?

Ans. Refer Q. 3.10, Page 3-15C, Unit-3.

5. Explain the various types of pitched roofs.

Ans. Refer Q. 4.11, Page 4-15C, Unit-4.

6. Explain the various methods of damp proofing.

Ans. Refer Q. 3.7, Page 3-11C, Unit-3.

7. What is puzzolana ? Explain the various puzzolanic materials.

Ans. Refer Q. 1.34, Page 1-44C, Unit-1.

8. Give the classification of building as per NBC with suitable examples.

Ans. Refer Q. 3.1, Page 3-20C, Unit-3.

9. What are varnishes ? Discuss its common constituents.

Ans. Refer Q. 2.7, Page 2-8C, Unit-2.

Section-C

Attempt any **two** questions from this section.

(2 × 15 = 30)

10. **What is cement ? Explain the various tests needed to be performed to ensure the suitability of cement.**

Ans. Refer Q. 1.26, Page 1-32C, Unit-1.

11. **Discuss in detail the various principles for planning the building.**

Ans. Refer Q. 3.3, Page 3-5C, Unit-3.

12. **Explain in detail with suitable sketches the setting out work that is needed to be carried out for a building.**

Ans. Refer Q. 3.4, Page 3-7C, Unit-3.



B.Tech.**(SEM. III) ODD SEMESTER THEORY
EXAMINATION, 2016-17****BUILDING MATERIAL AND CONSTRUCTION****Time : 3 Hours****Total Marks : 100****Section-A****1. Answer all questions.****(10 × 2 = 20)****a. Define DPC.****Ans.** Refer Q. 3.8, 2 Marks Questions, Page SQ-13C, Unit-3.**b. What is puzzolana ?****Ans.** Refer Q. 1.19, 2 Marks Questions, Page SQ-5C, Unit-1.**c. Define glass. What are the constituents of glass ?****Ans.** Refer Q. 2.16, 2 Marks Questions, Page SQ-10C, Unit-2.**d. Define paints and varnishes.****Ans.** Refer Q. 2.4, 2 Marks Questions, Page SQ-8C, Unit-2.**e. Define damp proofing.****Ans.** Refer Q. 3.7, 2 Marks Questions, Page SQ-13C, Unit-3.**f. What is stone masonry ?****Ans.** Refer Q. 3.19, 2 Marks Questions, Page SQ-14C, Unit-3.**g. What is the introduction of building plan ?****Ans.** Refer Q. 3.1, 2 Marks Questions, Page SQ-12C, Unit-3.**h. Define ventilation.**

Ans. Refer Q. 5.1, 2 Marks Questions, Page SQ-20C, Unit-5.

i. Define distemping.

Ans. Refer Q. 2.8, 2 Marks Questions, Page SQ-9C, Unit-2.

j. What are the different types of plastering ?

Ans. Refer Q. 5.23, 2 Marks Questions, Page SQ-22C, Unit-5.

Section-B

2. Attempt any three questions. (3 × 10 = 30)

a. Describe the process of production of concrete.

Ans. Refer Q. 1.29, Page 1-37C, Unit-1.

b. Discuss in detail essential constituents of paints. Give examples.

Ans. Refer Q. 2.5, Page 2-6C, Unit-2.

c. Discuss in details about flooring and its requirements.

Ans. Refer Q. 3.20, Page 3-32C, Unit-3.

d. Give the conventional symbols for :

1. Various types of doors.
2. Almirah.
3. Windows.
4. Sanitary items.
5. Electric items.

Ans. Refer Q. 3.26, Page 3-41C, Unit-3.

e. Describe the various elements of water supply system with the help of diagram.

Ans. Refer Q. 5.8, Page 5-10C, Unit-5.

Section-C

3. Attempt any five questions.

(5 × 10 = 50)

a. i. Explain the classification of stones.

Ans. Refer Q. 1.7, Page 1-9C, Unit-1.

ii. Explain the different types and identification of timber.

Ans. Refer Q. 1.35, Page 1-45C, Unit-1.

b. i. Describe the various tests on cement.

Ans. Refer Q. 1.26, Page 1-32C, Unit-1.

ii. Discuss about desirable characteristics of reinforcing steel.

Ans. Refer Q. 2.12, Page 2-13C, Unit-2.

c. i. Explain different types of glasses and its uses.

Ans. Refer Q. 2.19, Page 2-22C, Unit-2.

ii. Distinguish between varnishes and distempers.

Ans. Refer Q. 2.11, Page 2-11C, Unit-2.

d. i. Explain different types of floors and flooring materials.

Ans. Refer Q. 3.16, Page 3-26C, Unit-3.

ii. Give a detail description about brick, sand, stone and masonry construction.

Ans. Refer Q. 3.21, Page 3-35C, Unit-3.

e. i. Write short notes on cavity wall and hollow block construction.

Ans. Refer Q. 3.25, Page 3-40C, Unit-3.

ii. Describe the types of windows and its advantages.

Ans. Types of Windows : Refer Q. 4.5, Page 4-8C, Unit-4
Advantages of Windows : Refer Q. 4.6, Page 4-10C, Unit-4

f. i. Explain treatment of roof.

Ans. Refer Q. 4.12, Page 4-19C, Unit-4.

ii. Describe functional efficiency of building.

Ans. Refer Q. 4.15, Page 4-23C, Unit-4.

g. i. Describe the various types of ventilation.

Ans. Refer Q. 5.3, Page 5-5C, Unit-3.

ii. Explain the different types of plastering and pointing.

Ans. Plastering : Refer Q. 5.19, Page 5-21C, Unit-5.

Pointing : Refer Q. 5.20, Page 5-22C, Unit-5.



B.Tech.
(SEM. III) ODD SEMESTER THEORY
EXAMINATION, 2017-18
BUILDING MATERIAL & CONSTRUCTION

Time : 3 Hours

Max. Marks : 70

Note : Attempt all sections. Assume any missing data.

SECTION - A

1. Attempt all questions in brief.

a. What is Fat lime ?

(2 × 7 = 14)

Ans. Fat Lime :

1. This type of lime is known as the white lime, rich lime, pure lime, or high calcium lime.
2. It is popularly known as the fat lime as it slakes vigorously and its volume is increased to about 2 to 2.5 times.
3. It is 95 % CaO. The impurities are less than 5 %.
4. This lime is used for plastering and white washing of walls, preparing lime mortar with sand.

b. Discuss about Lime bursting.

Ans. Refer Q. 1.28, 2 Marks Questions, Page, SQ-6C, Unit-1.

c. Define Enamel Paints.

Ans. Enamel Paints :

1. It contains white lead, oil, petroleum spirit and resinous material.
2. The surface provided by it resists acids, alkalis and water very well.

 d. Differentiate between English Bond and Flemish Bond.**Ans. Comparison between English Bond and Flemish Bond :**

1. English bond is stronger than Flemish bond for walls more than 1½ brick.
2. Appearance of masonry in Flemish bond is more attractive.
3. Broken brick-bats are utilized in Flemish bond although they require a little more of mortar.
4. Flemish bond is a bit difficult than English bond. Flemish bond requires more skilled mason.

 e. What is the function of Lintels.**Ans.** Lintel supports the weight of the wall above the opening of door, windows and ventilator.

1. What do you mean by the word door?

Ans. Refer Q. 4.1, 2 Marks Questions, Page SQ-16C, Unit-4.

g. Explain the term 10 WT 13.

Ans. A designation 10WT13 denotes a window opening with single shutter, having width equal to 10 modules (i.e., $10 \times 100 = 1000$ mm) and height equal to 13 modules (i.e., $13 \times 100 = 1300$ mm).

SECTION-B

2. Attempt any three parts of the following: (7 × 3 = 21)

a. Discuss Bogue's compound of cement. Also write the chemical composition of cement.

Ans. The following Bogue's compounds are formed during clinkering process.

1. Tricalcium Silicate :

- It is supposed to be the best cementing material and is well burnt cement.
- It is about 25-50 % (normally about 40 %) of cement.
- It renders the clinker easier to grind, increases resistance to freezing and thawing, hydrates rapidly generating high heat and develops an early hardness and strength.
- However, raising of C_3S content beyond the specified limits increases the heat of hydration and solubility of cement in water.
- The heat of hydration is 500 J/g.

2. Dicalcium Silicate :

- It is about 25-40 % (normally about 32 %) of cement.
- It hydrates and hardens slowly and takes long time to add to the strength (after a year or more).
- It imparts resistance to chemical attack.
- Raising of C_2S content renders clinker harder to grind, reduces early strength, decreases resistance to freezing and thawing at early ages and decreases heat of hydration.
- The hydrolysis of C_2S proceeds slowly. The heat of hydration is 260 J/g.

3. Tricalcium Aluminate :

- It is about 5-11 % (normally about 10.5 %) of cement.
- It rapidly reacts with water and is responsible for flash set of finely grounded clinker.
- The rapidity of action is regulated by the addition of 2-3 % of gypsum at the time of grinding cement.
- Tricalcium aluminate is responsible for the initial set, high heat of hydration and has greater tendency to volume changes causing cracking.
- Raising the C_3A content reduces the setting time, weakens resistance to sulphate attack and lowers the ultimate strength, heat of hydration and contraction during air hardening.

vi. The heat of hydration is 865 J/g.

4. Tetracalcium Alumino Ferrite :

- It is about 8-14 % (normally about 9 %) of cement.
- It is responsible for flash set but generates less heat.
- It has poorest cementing value.
- Raising the C_4AF content reduces the strength slightly.
- The heat of hydration is 420 J/g.

Composition of Cement : Refer Q. 1.23, Page 1-28C, Unit-1.

b. What are the constituent, desirable properties and types of Paints?

Ans. **Constituent of Paints :** Refer Q. 2.5, Page 2-6C, Unit-2.
Properties and types : Refer Q. 2.4, Page 2-5C, Unit-2.

c. Discuss the various techniques and methods of Damp Prevention.

Ans. Refer Q. 3.7, Page 3-11C, Unit-3.

d. Discuss about Pitched Roof with neat sketch.

Ans. Refer Q. 4.9, Page 4-13 and Q. 4-11, Page 4-15, Unit-4.

e. Discuss about the traps used in sanitary plumbing.

Ans. **Trap :**

- The trap is a device which always remains full of water. It is a device which puts a barrier in the sewer line in the form of water seal and does not allow municipal sewer gases to escape into the house.
- The depth of barrier, in the form of water is called the water seal. The effectiveness of the trap depends upon the depth of water seal. The greater the depth of water seal, the more effective is the trap.
- Depth of the water seal varies from 2.5 cm to 7.5 cm.
- The traps can be classified according to shape or according to use :
 - According to shape traps may be P-type, Q-type and S-type as shown in Fig. 1(a), (b) and (c).
 - According to use they may be Floor or Nahani trap, Gully trap and Intercepting trap.

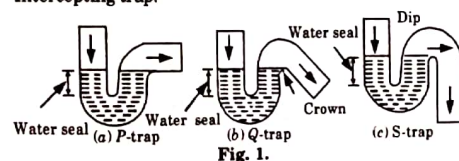


Fig. 1.

1. Floor Trap :

- It is made of cast iron and provided at the point of entry of waste water in the house. It will thus be placed in bath-rooms, kitchens, sinks etc.

- ii. A floor trap forms the starting point of waste water flow.
- iii. A cover with grating is provided at its top so as to prevent the entry of solid matter into the underground drain. The cover can be removed for the cleaning of the trap. Fig. 2.

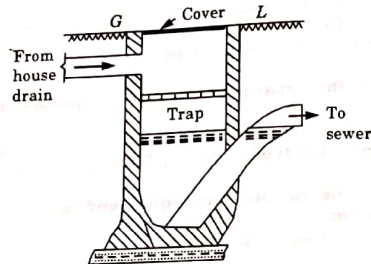


Fig. 2. Nahani trap.

2. Gully Trap :

- i. This trap is usually made of stoneware and a cast iron grating is provided at its top. The gully trap is fitted inside a masonry chamber. A water seal of about 75 mm is provided in this trap.
- ii. Gully trap forms the beginning point of horizontal flow of sewage, it is normally installed near the external face of the wall and it is kept slightly higher or even in line with the pavement or ground.
- iii. This trap takes sewage, either to sewer or to inspection chamber or man-hole. Fig. 3.

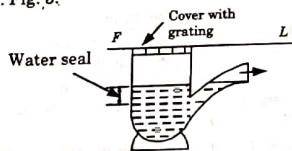


Fig. 3.

- iv. The top of the gully trap chamber is provided with a cover usually of CI which may be removed at the time of cleaning the trap.

3. Intercepting Trap :

- i. This trap has comparatively deeper water seal. It is provided at the last inspection chamber or manhole of the house drainage system.
- ii. Sewage coming from the house enters public sewer after passing through intercepting trap.
- iii. The main idea of providing the intercepting sewer trap is to prevent the entry of sewer gases from public sewer line into the house drains.
- iv. This trap consists of an inspection arm for the purpose of cleaning or inspection. It is kept closed by a lid or plug.

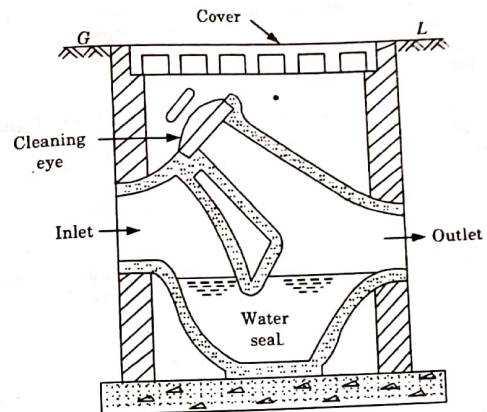


Fig. 4.

SECTION-C

3. Attempt any one part of the following : (7 × 1 = 7)
- a. What are different characteristics of stones and their methods of testing ? Write the name of various types of stones which are used in building work ?
- Ans. Characteristics : Refer Q. 1.8, Page 1-11C, Unit-1.
Method of testing : Refer Q. 1.9, Page 1-12C, Unit-1.
Types of Stones : Refer Q. 1.10, Page 1-14C, Unit-1.

- b. What do you mean by efflorescence of Brick and how will you classify the efflorescence in Brick ?

Ans. Efflorescence : Refer Q. 1.17, Page 1-21C, Unit-1.
Classification : Presence of efflorescence in bricks is classified as follows :

1. Nil : When the deposit of efflorescence is imperceptible.
2. Slight : When the deposit of efflorescence does not cover more than 10 percent of the exposed area of the brick.
3. Moderate : When the deposit of efflorescence is more than 10 per cent but less than 50 % of the exposed area of the brick.
4. Heavy : When the deposit of efflorescence is more than 50 per cent but the deposits do not powder or flake away the brick surface.
5. Serious : When the deposits are heavy and powder or flake away the brick surface.

4. Attempt any one part of the following : (7 × 1 = 7)
- Describe the various ingredients of plastic. Also discuss the different mechanical properties of plastic.**
Ans: Ingredients of Plastic : Refer Q. 2.1, Page 2-2C, Unit-2.
 Mechanical Properties : Refer Q. 2.3, Page 2-4C, Unit-2.
 - Discuss the properties, ingredients and uses of glass in building construction.**
Ans: Properties and Uses of Glass : Refer Q. 2.19, Page 2-22C, Unit-2.
 Ingredients of Glass : Refer Q. 2.18, Page 2-21C, Unit-2.
5. Attempt any one part of the following : (7 × 1 = 7)
- Write about the various requirements of a good staircase. How are the trade and riser are proportioned ?**
Ans: Refer Q. 3.13, Page 3-20C, Unit-3.
 - Write a note on soil treatment for termite.**
Ans: Refer Q. 3.10, Page 3-15C, Unit-3
6. Attempt any one part of the following : (7 × 1 = 7)
- Discuss various technical terms used in Doors.**
Ans: Following are the technical terms which are used in doors :
- Frame :**
 - Openings of doors and windows left in masonry work are fitted with timber or steel frames so that shutters may be attached to them.
 - A door frame consists of two vertical members called jambs and a horizontal member at the top connecting both the jambs. This top horizontal member is called head.
 - Sometimes, a horizontal member at floor level is also put to bind the jambs at the bottom. This member in that case is known as sill.
 - Hold Fast :**
 - It is generally, made from mild steel strap about 6 mm thick and 30 to 40 mm wide. It is 20 to 30 cm in length.
 - One end of the holdfast is connected to the frame but free end is split by sawing the strap along its middle width for some length and then both the parts of the sawed length are bent in opposite directions.
 - This is done to secure the frame tightly and firmly into the masonry.
 - For a door frame, six hold fasts are required. Three numbers are provided on each side of the door frame.

3. Horns :

- Projected parts of head or sill, beyond the outer face of the frame is known as horn.
 - Length of the horn is nearly 15 cm.
 - Horns when embedded in masonry help in tightly securing the frame into the masonry.
4. **Style or Stile :** Outside vertical members of frame-work of a shutter are known as styles or stiles.
5. **Top Rail :** The top-most horizontal member of a shutter frame-work is known as top rail.
6. **Lock Rail :** It is the middle horizontal member of a shutter of frame-work wherein locking arrangement is provided.
7. **Bottom Rail :** This is the lower-most horizontal piece of a shutter frame-work.
8. **Frieze Rail :** It is the horizontal member of the shutter frame work provided near the top rail but slightly below it. This rail is not always provided.
9. **Panel :** It is the area enclosed between vertical styles and horizontal rails (top, bottom, lock and frieze).
10. **Louver :** It is an inclined piece of timber fixed within a frame. Louvers are provided in window where vision is required to be prevented without affecting the ventilation system.

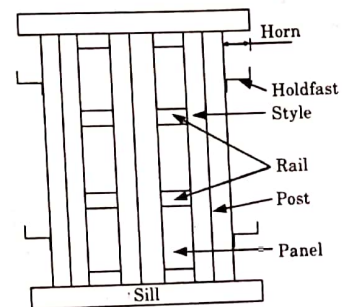


Fig. 5. Doors frame and its panelled shutters.

b. What is the classification of lintels ?

Ans. Refer Q. 4.13, Page 4-20C, Unit-4.

7. Attempt any one part of the following : (7 × 1 = 7)

a. Define the term ventilation. Discuss the factors which affect ventilation ? Which point should be kept in mind while planning ventilation in public building ?

Ans. Ventilation and Factors : Refer Q. 5.1, Page 5-2C, Unit-5.

Requirement : Refer Q. 5.2, Page 5-3C, Unit-5.

b. What is the difference between a lift and escalator ? What are the functional requirement of a lift in building ?

Ans. Refer Q. 5.11, Page 5-13C, Unit-5.

