



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)  
Dundigal, Hyderabad-500043

## CIVIL ENGINEERING

### TUTORIAL QUESTION BANK

<b>Course Title</b>	<b>BUILDING MATERIALS, CONSTRUCTION AND PLANNING</b>				
<b>Course Code</b>	ACEB02				
<b>Programme</b>	B.Tech				
<b>Semester</b>	III	CE			
<b>Course Type</b>	Core				
<b>Regulation</b>	IARE - R18				
<b>Course Structure</b>	<b>Theory</b>			<b>Practical</b>	
	<b>Lectures</b>	<b>Tutorials</b>	<b>Credits</b>	<b>Laboratory</b>	<b>Credits</b>
	3	1	4	-	-
<b>Chief Coordinator</b>	Mr. K. Anand Goud, Assistant Professor.				
<b>Course Faculty</b>	Mr. K. Anand Goud, Assistant Professor. Mr. K. Tarun Kumar, Assistant Professor.				

### COURSE OBJECTIVES:

<b>The course should enable the students to:</b>	
I	Develop knowledge of material science and behaviour of various building materials used in construction.
II	Identify the construction materials required for the assigned work.
III	Provide procedural knowledge of the simple testing methods of cement, lime and concrete etc.
IV	List the requirements and different types of stairs.

### COURSE OUTCOMES (COs):

CO 1	Understand the types, properties of stones, manufacturing process of bricks, types of bricks and aggregates.
CO 2	Describe the different types of cements, admixtures, manufacturing process, properties of cement, ingredients of cement concrete and tests conducted on concrete.
CO 3	Identify the components of building, types of foundations and differentiate types of materials depending on its function.
CO 4	Describe the properties of wood, aluminium, glass and different types of wood, masonry used in buildings.
CO 5	Explain principles of building planning, building by laws, classification of buildings and stairs.

## COURSE LEARNING OUTCOMES (CLOs):

ACEB02.01	Predict the properties of building stones and its classifications.
ACEB02.02	Understand the concept of various methods of manufacture of bricks.
ACEB02.03	Identify rock using basic geological classification systems.
ACEB02.04	Differentiate the fine aggregates and coarse aggregates under various views.
ACEB02.05	Explain various types of cements and their applications in construction various field and laboratory tests on cement.
ACEB02.06	Analyse the importance of mineral and chemical admixtures, requirements of the concrete in construction.
ACEB02.07	Explain different types of lintel, arches and the materials which are commonly used for construction.
ACEB02.08	Explain the suitability of floors in buildings like mosaic flooring, terrazzo flooring, rubber flooring, asphalt flooring.
ACEB02.09	Understand the different of trusses, rcc roofs, madras terrace/shell roofs.
ACEB02.10	Explain the foundations and uses of different types of foundations.
ACEB02.11	Develop the building walls and foundations how they will help for buildings and details to precise the type of footings.
ACEB02.12	Explain the classification of various types of woods. State the properties, seasoning of timber.
ACEB02.13	Understand the types of properties of wood, aluminium and manufacture of glass.
ACEB02.14	Differentiate the uses of galvanized iron, fiber-reinforcement plastics, steel and aluminium in construction.
ACEB02.15	Understand masonry, English and flemish bonds. Finishing plastering painting and know about building services.
ACEB02.16	Explain geometrical design of RCC doglegged and open-well stairs. Classification of staircase and technical terms and types of stairs.
ACEB02.17	Principle of building planning and by laws and standards of building material components and orientation of the building.
ACEB02.18	Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.
ACEB02.19	Understand the requirements of good stairs.
ACEB02.20	Design RCC doglegged and open-well stairs.

## TUTORIAL QUESTION BANK

MODULE- I				
STONES, BRICKS AND AGGREGATES				
Part - A (Short Answer Questions)				
S No	QUESTIONS	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes (CLOs)
1	Why you choose stone as a building material?	Understand	CO 1	ACEB02.01
2	Write down the characteristics of good stone?	Remember	CO 1	ACEB02.01
3	Mention the basic classifications of stones.	Remember	CO 1	ACEB02.01
4	State any four advantages of bricks as compared with stones.	Understand	CO 1	ACEB02.02
5	What is the common classification of aggregates?	Remember	CO 1	ACEB02.04
6	What are the properties and uses of first class bricks?	Remember	CO 1	ACEB02.02
7	Name the types of rocks according to geological classification.	Remember	CO 1	ACEB02.03
8	State the classification of rocks with examples.	Remember	CO 1	ACEB02.03
9	What are the constituents of good brick earth?	Remember	CO 1	ACEB02.02
10	Name the operations involved in the manufacture of brick.	Remember	CO 1	ACEB02.02
11	Write down the tests for coarse aggregate?	Remember	CO 1	ACEB02.04
12	What is dressing of stones?	Understand	CO 1	ACEB02.01
13	Define tempering?	Remember	CO 1	ACEB02.02
14	What is unsoiling?	Remember	CO 1	ACEB02.02
15	What is meant by aggregates? Classify the aggregates based on its size.	Remember	CO 1	ACEB02.04
16	List out the names of bricks for special use.	Understand	CO 1	ACEB02.02
17	What are the advantages & disadvantages of clamp burning?	Remember	CO 1	ACEB02.02
18	What are the advantages & disadvantages of kiln burning?	Remember	CO 1	ACEB02.02
19	State the points to be considered in selecting a site for quarry of stones.	Remember	CO 1	ACEB02.01
20	State the purpose of dressing of stones.	Understand	CO 1	ACEB02.01
Part - B (Long Answer Questions)				
1	What are the operations involved in manufacturing of bricks? Explain them briefly.	Understand	CO 1	ACEB02.02
2	Illustrate the geological, physical and chemical classification of rocks?	Remember	CO 1	ACEB02.03
3	Describe the characteristics of good building stones.	Remember	CO 1	ACEB02.01
4	Illustrate the classification of bricks with neat sketch.	Understand	CO 1	ACEB02.02
5	What do you understand about the dressing of stones and explain briefly?	Remember	CO 1	ACEB02.01
6	What test are to be made on bricks explain any three of them?	Remember	CO 1	ACEB02.02
7	Explain the qualities of good building stones.	Remember	CO 1	ACEB02.01
8	Write the various methods of quarrying of stones. Explain briefly.	Understand	CO 1	ACEB02.01
9	Explain in detail the process of manufacturing of bricks.	Understand	CO 1	ACEB02.02
10	State the uses of stones in various construction works.	Remember	CO 1	ACEB02.01
11	Elaborate the following a) Tests on the aggregates b) Measurement of moisture content of aggregates	Remember	CO 1	ACEB02.04
12	Mention different methods of stone quarrying and explain briefly about each method.	Understand	CO 1	ACEB02.01
13	Discuss the classification of bricks and explain about their qualities, special types of bricks?	Understand	CO 1	ACEB02.02
14	Write Short notes on: i. Tempering ii. Frog iii. Ground– moulded bricks iv. Runnel kiln	Understand	CO 1	ACEB02.02
15	Explain briefly factors affecting workability of aggregates?	Understand	CO 1	ACEB02.04
16	Write Short notes on: i. Sieve analysis ii. Specific gravity iii. Bulking iv. Moisture content	Understand	CO 1	ACEB02.04

17	Give a detail account on classification of aggregates?	Remember	CO 1	ACEB02.04
18	Explain shape and texture of the aggregate?	Understand	CO 1	ACEB02.04
19	What is grading of aggregates? How does it affect the properties of concrete?	Remember	CO 1	ACEB02.04
20	Explain the uses of the following building materials. a) Marble b) Granite c) Basalt d) Sandstone	Remember	CO 1	ACEB02.01
21	Describe the different tests done on aggregates. Explain about determination of aggregate abrasion value?	Understand	CO 1	ACEB02.04

## MODULE-II

### CEMENT AND ADMIXTURES

#### Part – A (Short Answer Questions)

1	List out the ingredients of cement.	Remember	CO 2	ACEB02.05
2	List out the various grades of cement in India.	Remember	CO 2	ACEB02.05
3	What do you mean by setting time of cement?	Remember	CO 2	ACEB02.05
4	Enumerate various types of cement?	Understand	CO 2	ACEB02.05
5	What are admixtures?	Understand	CO 2	ACEB02.06
6	What are different types of admixtures?	Remember	CO 2	ACEB02.06
7	Give the chemical composition of cement.	Understand	CO 2	ACEB02.05
8	What are the properties of OPC?	Remember	CO 2	ACEB02.05
9	What are the different ingredients used in concrete?	Understand	CO 2	ACEB02.06
10	List harmful constituents in cement.	Understand	CO 2	ACEB02.05
11	State four important uses of rapid hardening cement.	Remember	CO 2	ACEB02.05
12	What is a chemical admixture?	Remember	CO 2	ACEB02.06
13	What are the different types of chemical admixture?	Understand	CO 2	ACEB02.06
14	What are mineral admixtures?	Understand	CO 2	ACEB02.06
15	What are the different types of mineral admixtures?	Understand	CO 2	ACEB02.06
16	What are the properties of cement?	Understand	CO 2	ACEB02.05
17	List the various uses of cement.	Remember	CO 2	ACEB02.05
18	State different standard test of cement and its aim?	Understand	CO 2	ACEB02.05
19	What are the different tests conducted on the concrete?	Remember	CO 2	ACEB02.06
20	List out the uses of Portland pozzolana cement?	Understand	CO 2	ACEB02.05

#### Part - B (Long Answer Questions)

1	Explain briefly about the tests conducted on cement to find its properties?	Understand	CO 2	ACEB02.05
2	Describe in briefly any type of manufacture of cement with the help of flow diagram?	Understand	CO 2	ACEB02.05
3	Explain about different mineral admixtures?	Understand	CO 2	ACEB02.06
4	Explain the field tests on cement? Write the chemical composition of ordinary Portland cement.	Remember	CO 2	ACEB02.05
5	Explain why gypsum is added during the manufacture of cement?	Remember	CO 2	ACEB02.05
6	Differentiate between the following: i. Initial setting time and final setting time ii. Hydration and hardening of cement	Understand	CO 2	ACEB02.05
7	What do you understand by the term setting and hardening of cement?	Remember	CO 2	ACEB02.05
8	Describe the role played by super plasticizers in concrete.	Understand	CO 2	ACEB02.06
9	Explain about different chemical admixtures?	Understand	CO 2	ACEB02.06
10	Write short notes on: i. Soundness test of cement ii. Tensile strength test of cement	Remember	CO 2	ACEB02.05
11	Describe the methods of manufacture of cement. Explain any one method with flow diagram.	Remember	CO 2	ACEB02.05
12	What are the tests conducted in laboratory for the cement? Explain any one method.	Remember	CO 2	ACEB02.05
13	Explain action of plasticizers and classification of super plasticizer?	Understand	CO 2	ACEB02.06
14	Explain about hydration of cement?	Understand	CO 2	ACEB02.05
15	Mention various tests conducted on concrete.	Understand	CO 2	ACEB02.06
16	Distinguish between natural and chemical admixtures?	Understand	CO 2	ACEB02.06
17	What is meant by workability of concrete? Mention different tests conducted on workability of concrete.	Understand	CO 2	ACEB02.06
18	Describe the factors affecting strength and workability of concrete.	Remember	CO 2	ACEB02.06

19	Explain about special purpose of cements of the following a) Rapid hardening Portland cement b) Low heat Portland cement	Understand	CO 2	ACEB02.05
20	What are the methods of testing the properties of green concrete? Describe them briefly.	Understand	CO 2	ACEB02.06

### MODULE -III

#### BUILDING COMPONENTS AND FOUNDATIONS

##### Part - A (Short Answer Questions)

1	Define following terms i. Arch. ii. Lintel. iii. Truss.	Understand	CO 3	ACEB02.07
2	What are the components of an arch?	Remember	CO 3	ACEB02.07
3	What is the use of lintel?	Remember	CO 3	ACEB02.07
4	What are the different types of suspended floors?	Understand	CO 3	ACEB02.08
5	What are the different types of floors?	Remember	CO 3	ACEB02.08
6	Write the classification of lintels.	Understand	CO 3	ACEB02.07
7	Mention different types of roofs?	Remember	CO 3	ACEB02.09
8	What are the types of trussed roofs?	Understand	CO 3	ACEB02.09
9	Write the component parts of a floor.	Understand	CO 3	ACEB02.07
10	List out the advantages of flat roof and curved roofs.	Remember	CO 3	ACEB02.09
11	Name important metals used in roof construction.	Remember	CO 3	ACEB02.09
12	What is the difference between King post truss and queen post truss? Draw the diagrams.	Understand	CO 3	ACEB02.09

13	What is Shallow foundation?	Remember	CO 3	ACEB02.10
14	What are the advantages of damp proof coursing?	Understand	CO 3	ACEB02.11
15	Name any four types of shallow foundations.	Remember	CO 3	ACEB02.10
16	What are the main types of foundations?	Remember	CO 3	ACEB02.10
17	What is grillage footing?	Understand	CO 3	ACEB02.11
18	What is the function of footing?	Remember	CO 3	ACEB02.11
19	What is combined footing?	Remember	CO 3	ACEB02.11
20	Define strap footing.	Understand	CO 3	ACEB02.11
21	Mention the components of foundation.	Remember	CO 3	ACEB02.10
22	What is the difference between strap footing and combined footing?	Understand	CO 3	ACEB02.10

##### Part – B (Long Answer Questions)

1	What are the different types of arches that are used for engineering construction? Describe any three types in detail with sketches.	Understand	CO 3	ACEB02.07
2	What are the advantages of R.C.C. floors?	Understand	CO 3	ACEB02.08
3	Describe briefly about different types of ground floors.	Understand	CO 3	ACEB02.08
4	Explain the construction of composite floors briefly.	Remember	CO 3	ACEB02.08
5	Describe classification of lintel based on materials and work man ship.	Remember	CO 3	ACEB02.07
6	Write short note on: 1. Cement concrete floor 2. Terrazzo floor 3. Mosaic floor	Understand	CO 3	ACEB02.08
7	What are the requirements of good roof?	Remember	CO 3	ACEB02.09
8	Mention different classifications of roofs. Explain about pitched roofs.	Understand	CO 3	ACEB02.09
9	Describe classification of lintel based on materials and work man ship.	Understand	CO 3	ACEB02.07
10	Write short notes on the following, a) Flat arch b) Relieving arch c) Bull's arch d) Elliptical arch	Remember	CO 3	ACEB02.07

11	List the different types of foundations, Explain shallow foundations.	Remember	CO 3	ACEB02.10
12	Discuss about the combined footing with neat sketch.	Understand	CO 3	ACEB02.11
13	Sketch and explain about strap and mat footing.	Understand	CO 3	ACEB02.11
14	Write a short note with neat sketch for the Spread footings.	Understand	CO 3	ACEB02.11

15	Explain the terms i. Ultimate bearing capacity ii. Allowable bearing capacity of soil	Understand	CO 3	ACEB02.10
16	Explain the requirements of good foundation.	Understand	CO 3	ACEB02.10
17	Write a short note on following with neat sketches i. Strip footing. ii. Spread or isolated footing. iii. Combined footing.	Understand	CO 3	ACEB02.11
18	Write a short note on following with neat sketches i. Strap footing. ii. Mat or raft foundation.	Remember	CO 3	ACEB02.11
19	Write the differences between shallow foundation and deep foundation.	Understand	CO 3	ACEB02.10
20	Explain the types of shallow foundations in brief.	Understand	CO 3	ACEB02.10

#### MODULE -IV

#### WOOD, ALUMINIUM AND GLASS

#### Part – A (Short Answer Questions)

1	Define Seasoning of timber.	Remember	CO 4	ACEB02.12
2	What are the important qualities of timber?	Remember	CO 4	ACEB02.12
3	What are the properties of glass?	Remember	CO 4	ACEB02.13
4	Define the following a) pith b) heart wood	Understand	CO 4	ACEB02.12
5	What is the function of sapwood and cambium layer?	Understand	CO 4	ACEB02.12
6	Define ferrous metals. What are the different categories of ferrous metals?	Remember	CO 4	ACEB02.15
7	What are the different types of glass?	Understand	CO 4	ACEB02.13
8	What role does aluminium play in building construction?	Remember	CO 4	ACEB02.13
9	Write down the general requirements of mortars?	Understand	CO 4	ACEB02.15
10	What is concrete Block masonry?	Understand	CO 4	ACEB02.15
11	What is brick masonry?	Remember	CO 4	ACEB02.15
12	Name any four wood based products.	Remember	CO 4	ACEB02.12
13	What are the different types of rubble masonry?	Understand	CO 4	ACEB02.15
14	What are the different types of tools required for dressing of stone and masonry works?	Understand	CO 4	ACEB02.15
15	Mention different types of defects in timber.	Understand	CO 4	ACEB02.12
16	What is the difference between plastering and pointing?	Understand	CO 4	ACEB02.15
17	Name important non-metals used in the building construction?	Remember	CO 4	ACEB02.14
18	Define stone masonry? What are the uses of stone masonry?	Understand	CO 4	ACEB02.15
19	What are the different types of timber based on i. Position. ii. Durability.	Remember	CO 4	ACEB02.12
20	Define the following terms: i. Stretcher ii. Quoins	Understand	CO 4	ACEB02.15
21	What is the standard and nominal size of brick?	Remember	CO 4	ACEB02.15
22	How many bricks are required for cubic meter of brick masonry?	Remember	CO 4	ACEB02.15
23	Define the following terms: i. Header. ii. Stretcher. iii. Frog.	Understand	CO 4	ACEB02.15
24	What is the purpose of providing frog in the bricks?	Understand	CO 4	ACEB02.15

#### Part – B (Long Answer Questions)

1	What is brick masonry? State and explain briefly the various classifications of brick masonry?	Understand	CO 4	ACEB02.15
2	Describe the ashlar stone masonry and state its uses in construction of structures?	Remember	CO 4	ACEB02.15
3	What is Reinforced cement concrete (R.C.C) and explain its importance in construction of structures?	Remember	CO 4	ACEB02.15
4	Compare the merits and demerits of stone masonry and brick masonry?	Understand	CO 4	ACEB02.15
5	Describe briefly about the types of bonds in brick work?	Remember	CO 4	ACEB02.15

6	Explain in detail the causes of decay of wood work and their preservation?	Understand	CO 4	ACEB02.12
7	Explain the process of manufacturing of Glass? What are the Uses of glass in construction industry?	Understand	CO 4	ACEB02.13
8	Define ashlar masonry. Explain briefly about different types of ashlar masonry.	Understand	CO 4	ACEB02.15
9	Explain about the manufacturing process of aluminium? What are the properties of aluminium?	Understand	CO 4	ACEB02.13
10	Mention any three-wood based products. Explain defects in timber with suitable diagrams?	Remember	CO 4	ACEB02.12
11	What are the characteristics of good timber?	Remember	CO 4	ACEB02.12
12	Define seasoning of timber. What are the objects of seasoning of timber?	Understand	CO 4	ACEB02.15
13	What are the methods of seasoning of timber. Explain them briefly.	Understand	CO 4	ACEB02.12
14	Explain the following with neat sketch i. King closer ii. Queen closer iii. Stretching course iv. Heading course	Remember	CO 4	ACEB02.15
15	Explain the fire-resisting properties of the following material i. Timber ii. Stone iii. Bricks iv. Concrete	Understand	CO 4	ACEB02.12
16	Explain about seasoning of timber and objects of seasoning of timber.	Understand	CO 4	ACEB02.12
17	What are the properties of glass and mention the different types of glasses?	Remember	CO 4	ACEB02.13
18	Discuss the special types and uses of glass?	Remember	CO 4	ACEB02.13
19	Explain in detail about Classifications of bonds in bricks with neat sketches?	Remember	CO 4	ACEB02.15
20	Write about English and flemish bond with neat sketches.	Understand	CO 4	ACEB02.15

#### MODULE - V

#### STAIRS AND BUILDING PLANNING

##### Part - A (Short Answer Questions)

1	Write the Requirements of a good stair?	Remember	CO 5	ACEB02.19
2	Define Baluster.	Remember	CO 5	ACEB02.16
3	Distinguish between riser and tread?	Remember	CO 5	ACEB02.16
4	Define staircase and list out the technical terms associated with the design and construction of stairs?	Understand	CO 5	ACEB02.16
5	What are classifications of stairs according to their layout?	Understand	CO 5	ACEB02.16
6	Define building planning.	Remember	CO 5	ACEB02.17
7	Write briefly the factors affecting building planning.	Understand	CO 5	ACEB02.17
8	Write any four basic principles of building planning in respect of residential building?	Remember	CO 5	ACEB02.17
9	What is orientation?	Understand	CO 5	ACEB02.17
10	State the factors affecting orientation?	Understand	CO 5	ACEB02.17
11	What is the difference between dog legged stairs and open well stairs?	Remember	CO 5	ACEB02.17
12	State the functions of local authority.	Remember	CO 5	ACEB02.17
13	Define floor area ratio?	Understand	CO 5	ACEB02.17
14	Classify the building based on occupancy.	Understand	CO 5	ACEB02.17
15	Classify the building based on type on construction.	Understand	CO 5	ACEB02.17
16	Mention any five principles of planning the building.	Understand	CO 5	ACEB02.17
17	What are the points to be considered while selecting a site for any particular building?	Remember	CO 5	ACEB02.17
18	What are building bye laws?	Understand	CO 5	ACEB02.17
19	Define floor space index?	Remember	CO 5	ACEB02.17
20	define residential building	Understand	CO 5	ACEB02.17

##### Part - B (Long Answer Questions)

1	Explain the following: i. Step ii. Riser iii. Tread iv. Noising v. Going or run	Understand	CO 5	ACEB02.16
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2	State the various types of stairs through flow diagrams.	Remember	CO 5	ACEB02.16
3	Explain about classification of stairs with figure.	Remember	CO 5	ACEB02.16
4	Elaborate the Half turn stairs and Continuous stairs with neat sketches.	Understand	CO 5	ACEB02.16
5	State briefly the requirement of good stair.	Remember	CO 5	ACEB02.16
6	Write short note on half turn stairs.	Understand	CO 5	ACEB02.20
7	Discuss briefly about the following i. Wooden stairs ii. RCC stairs	Remember	CO 5	ACEB02.16
8	Explain different types of stairs according layout with neat sketches.	Understand	CO 5	ACEB02.16
9	Distinguish between quarter turn stairs and bifurcated stair?	Understand	CO 5	ACEB02.16
10	Explain about following principles of building planning. i. Aspect ii. Prospect iii. Roominess iv. Grouping v. Circulation	Remember	CO 5	ACEB02.17
11	Define building planning. What is the significance of building planning?	Remember	CO 5	ACEB02.17
12	What is the scope of building planning?	Understand	CO 5	ACEB02.17
13	Explain briefly the factors affecting building planning?	Understand	CO 5	ACEB02.17
14	Explain briefly about the principles of planning?	Remember	CO 5	ACEB02.17
15	Explain various principles underlying building bye-laws.	Understand	CO 5	ACEB02.17
16	Classify the different types of buildings according to NBC?	Understand	CO 5	ACEB02.17
17	State and explain the various basic principles of building planning?	Remember	CO 5	ACEB02.17
18	What is meant by orientation and state the factors affecting the orientation of building?	Remember	CO 5	ACEB02.17
19	Explain the following terms: i. Floor area ratio ii. Floor space index	Remember	CO 5	ACEB02.17
20	What are the factors to be considered while selecting site for any building construction?	Understand	CO 5	ACEB02.17

**Prepared by:**

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