



**MEDICAPS**  
UNIVERSITY

# Faculty of Engineering

## End Semester Examination May 2025

### CE3EC03 Construction Equipment & Materials

<b>Programme</b>	<b>:</b>	<b>B.Tech.</b>	<b>Branch/Specialisation</b>	<b>:</b>	<b>CE</b>
<b>Duration</b>	<b>:</b>	<b>3 hours</b>	<b>Maximum Marks</b>	<b>:</b>	<b>60</b>

**Note:** All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.

<b>Section 1 (Answer all question(s))</b>					<b>Marks</b>	<b>CO</b>	<b>BL</b>
<b>Q1.</b>	Fly ash bricks are preferred over traditional clay bricks because they:				<b>1</b>	<b>1</b>	<b>1</b>
	<input type="radio"/> Are more porous	<input checked="" type="radio"/> Have better strength and durability					
	<input type="radio"/> Require more water for curing	<input type="radio"/> Have lower load-bearing capacity					
<b>Q2.</b>	Which of the following is a key advantage of AAC (Autoclaved Aerated Concrete) blocks?				<b>1</b>	<b>2</b>	<b>2</b>
	<input checked="" type="radio"/> High thermal insulation	<input type="radio"/> High density					
	<input type="radio"/> High weight	<input type="radio"/> Requires more cement					
<b>Q3.</b>	What is the purpose of anodizing aluminum in construction?				<b>1</b>	<b>2</b>	<b>2</b>
	<input type="radio"/> To increase its weight	<input checked="" type="radio"/> To enhance corrosion resistance and appearance					
	<input type="radio"/> To make it brittle	<input type="radio"/> To reduce its durability					
<b>Q4.</b>	Which type of admixture is used to increase the setting time of concrete?				<b>1</b>	<b>1</b>	<b>1</b>
	<input type="radio"/> Water reducer	<input type="radio"/> Air-entraining agent					
	<input type="radio"/> Accelerator	<input checked="" type="radio"/> Retarder					
<b>Q5.</b>	Which of the following excavating equipment is best suited for digging below the machine's working level?				<b>1</b>	<b>2</b>	<b>2</b>
	<input type="radio"/> Power shovel	<input type="radio"/> Clamshell					
	<input type="radio"/> Dragline	<input checked="" type="radio"/> Backhoe					
<b>Q6.</b>	Which type of roller is most effective for compacting cohesive soils like clay?				<b>1</b>	<b>2</b>	<b>2</b>
	<input type="radio"/> Smooth-wheel roller	<input type="radio"/> Pneumatic-tire roller					
	<input checked="" type="radio"/> Sheep-foot roller	<input type="radio"/> Vibratory roller					
<b>Q7.</b>	Trenching machines are primarily used for:				<b>1</b>	<b>1</b>	<b>1</b>
	<input type="radio"/> Excavating foundations for high-rise buildings	<input checked="" type="radio"/> Digging narrow, deep trenches for pipelines and cables					
	<input type="radio"/> Compacting soil	<input type="radio"/> Mixing cement					
<b>Q8.</b>	Which type of drilling is commonly used in hard rock formations?				<b>1</b>	<b>2</b>	<b>2</b>
	<input type="radio"/> Percussion drilling	<input type="radio"/> Auger drilling					
	<input checked="" type="radio"/> Rotary drilling	<input type="radio"/> Hand drilling					
<b>Q9.</b>	Which of the following materials is commonly used for thermal insulation on roofs?				<b>1</b>	<b>1</b>	<b>1</b>
	<input type="radio"/> Bitumen	<input checked="" type="radio"/> Expanded polystyrene (EPS)					
	<input type="radio"/> Steel mesh	<input type="radio"/> Reinforced concrete					

**Q10.** Whitewashing is commonly done using:

1 2 2

- ☐ Cement and sand
 ☐ Synthetic resin  
☐ Oil-based paint
 ☒ Lime and water

**Section 2 (Answer any 2 question(s))**

Marks CO BL

**Q11.** What are pre-stressing tendons? Discuss the different types of pre-stressing tendons and their uses.

5 2 2

Rubric	Marks
Definition of Tendons - 1 marks Types of Tendons - 2 marks Uses of Tendons - 2 marks	5

**Q12.** How would you explain ready-mixed concrete, its different types, and their uses in construction.

5 3 3

Rubric	Marks
Definition of ready-mixed concrete - 1 marks Types of ready-mixed concrete - 2 marks Uses in construction of ready-mixed concrete -2 marks	5

**Q13.** How would you analyze the differences between AAC blocks and traditional clay bricks in terms of their performance, cost-effectiveness, and environmental impact in construction?

5 4 4

Rubric	Marks
differences between AAC blocks and traditional clay bricks -5 marks	5

**Section 3 (Answer any 2 question(s))**

Marks CO BL

**Q14.** What is Admixture? Discuss the different types of admixtures in detail.

5 2 2

Rubric	Marks
Definition of Admixture - 1 marks on Proper explanation of any 4 - 4 Marks	5

**Q15.** How would you analyze the role of sealants in construction, and evaluate the different types of sealants used in buildings based on their performance, application, and effectiveness?

5 4 4

Rubric	Marks
Role of Sealants- 2 marks Types of sealants - 3 marks	5

**Q16.** How would you critically assess the various types of finishes used in building construction, considering their impact on aesthetics, durability, and functionality?

5 5 5

Rubric	Marks
On proper explanation of any 3 types of finishes.- 5 Marks	5

**Section 4 (Answer all question(s))**

Marks CO BL

**Q17.** Discuss the advantages and limitations of using a crawler crane in construction projects.

4 2 2

Rubric	Marks
Advantages of crawler crane in construction projects. -2 marks Limitations of crawler crane in construction projects -2 marks	4

- Q18. (a)** How would you compare the working principles and applications of a sheep foot roller and a pneumatic roller in soil compaction, highlighting their differences in performance? 6    2    2

Rubric	Marks
Comparison of working principles and application of sheep foot roller and pneumatic roller in soil compaction -4 marks Difference in performance - 2 Marks	6

(OR)

- (b)** How would you analyze the operations of a backhoe and evaluate the factors that affect its output, considering its efficiency and performance in various construction scenarios?

Rubric	Marks
Explanation of Back Hoe -2 marks operations -2 marks Factors affecting of out put -2 marks	6

### Section 5 (Answer all question(s))

Marks CO BL

- Q19.** Explain tunnel boring machine and its working principle in detail with neat sketch. 4    2    2

Rubric	Marks
Explanation -2 marks working principle & sketch - 2 marks	4

- Q20. (a)** How would you analyze the functioning of two different types of pile driving equipment used in construction, and evaluate their effectiveness in various construction conditions? 6    2    2

Rubric	Marks
On Proper Explaining any 2 types,- 3 marks each type	6

(OR)

- (b)** How would you critically assess the performance and efficiency of two types of hauling equipment used in construction, considering their impact on project timelines, cost, and overall productivity?

Rubric	Marks
performance and efficiency of two types of hauling equipment used in construction - 4 marks their impact on project timelines, cost, and overall productivity - 2 marks	6

### Section 6 (Answer any 2 question(s))

Marks CO BL

- Q21.** Explain the process and advantages of cast-in-situ reinforced concrete roof construction. 5    2    2

Rubric	Marks
Process of cast-in-situ reinforced concrete roof construction - 2 marks Advantages of cast-in-situ reinforced concrete roof construction - 3 marks	5

**Q22.** How would you compare the different types of flooring materials used in construction, focusing on their characteristics, advantages, and suitability for various applications? 5 3 3

Rubric	Marks
On explaining any 4 flooring materials	5

**Q23.** How would you analyze the different types of plastering materials used in construction, evaluating their properties, applications, and suitability for specific building requirements? 5 4 4

Rubric	Marks
On explaining any 2 types	5

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