

B.E.C.E. 2ND YEAR EXAMINATION, 20251ST SEMESTER

SUBJECT: BUILDING MATERIALS & CONSTRUCTION

TIME: THREE HOURS

FULL MARKS:100

USE A SEPARATE ANSWER-SCRIPT FOR EACH PART

No. of Questions	Part-I (Marks 60)	Marks
	For Section-A, answer Question number 1 (Compulsory) and any one from the rest. For Section-B, answer Question number 4 (Compulsory) and any three from the rest. All the drawings should be in pencil. Section-A (CO-1) Q1. Identify in which type of classification based on occupancy as per NBC, 2016 the following buildings fall: (i) Libraries; (ii) Hospitals and sanatoria; (iii) Underground or elevated railway platform. As per NBC, 2016 which building is considered the least fire-resistant building? Write the full form of PPC and DPC and mention where you will apply them with respect to the section of a building. Discuss different loads that you will have to consider when you will design a building Q2. (a) Differentiate between: (i) Raft foundation and strap foundation; (ii) Combined foundation and isolated footing; (iii) Well foundation and pile foundation (b) When will you recommend pointing work? What is curing for granolithic floor? Q3. (a) Mention the position and purpose of the following fittings with reference to plumbing system: Gully trap; goose neck; antisiphonage pipe (b) Differentiate between: (i) ferrule and cowl; (ii) Single stack system and one pipe system of wastewater drainage Section-B (CO-2) Q4. Fill in the blanks i. The crushing strength of 1st class brick in India is----- ii. The volume of one bag of good quality cement is-----m³ iii. Brown rot of wood is due to _____ iv. The recommended specific surface area for ordinary Portland cement of 53 grade is _____ v. The bulking of sand is maximum for _____ vi. The cement sand ratio recommends for plastering work in ceiling is _____ vii. The recommended nickel alloy for construction of water pump or water tank in corrosion prone area is _____ viii. Increase in alumina % in brick earth will result in _____ in brick. ix. _____ is commonly used as base material for woodwork. x. _____ is a naturally obtained surface treatment material for woodwork. Q5. (a) With neat sketch define: Quoin closure, lapping in brick bond and rubble masonry work	1×4+3×2 2 × 3 2 × 2 2×3 2×2 1×10=10 2×3

[Turn over

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Q5.(b)	Determine fineness modulus for this sand. <table><tr><th>Sieve Size</th><th>% Passing through Sieve</th></tr><tr><td>10 mm</td><td>100</td></tr><tr><td>4.75 mm</td><td>90-100</td></tr><tr><td>2.36 mm</td><td>60-65</td></tr><tr><td>1.18 mm</td><td>30-70</td></tr><tr><td>600 μ</td><td>15-34</td></tr><tr><td>300 μ</td><td>5-20</td></tr><tr><td>150 μ</td><td>0-10</td></tr></table>	Sieve Size	% Passing through Sieve	10 mm	100	4.75 mm	90-100	2.36 mm	60-65	1.18 mm	30-70	600 μ	15-34	300 μ	5-20	150 μ	0-10	4
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Q6.	With a neat section of a hardwood mention pith, medullary rays, annual rings and inner bark. What is veneer? Identify the nature of defects: rindgall; wane; bow.	5 +2+ 1 $\times$ 3																
Q7. (a)	Write the recommended standard values for 43 grade of ordinary Portland cement and the instrument to analysis the properties: final setting time, 7-day compressive strength. Define admixture. What is C-S-H gel?	2 $\times$ 5																
(b)	What is the recommended water quality for the preparation of concrete as per IS 456:2000																	
Q8.	Mention two environmentally sustainable uses of flyash as building materials. How will you prepare fire resistant mortar? Why drier and thinner are added in paint? Suggest the best suitable application for the following surface finishing elements: enamel paint, emulsion paint, lime putty. Name one material or item which will be utilised during construction and remove after construction.	2 $\times$ 3 +1 $\times$ 4																

Ref. No. : Ex/CE/PC/B/T/216/2025

Name of the Examinations: B.E. CIVIL ENGINEERING SECOND YEAR FIRST SEMESTER - 2025

Subject : BUILDING MATERIAL & CONSTRUCTION

Time: 3 Hours (Total)

Part: II Marks: 40

Full Marks: 100

Instructions:	
I	Use Separate Answer scripts for each part.
II	All notations represent their standard relevant meaning.
III	If you feel that any data or condition is/are missing in any question, please assume relevant inputs and mention the same.

Sl No	Question	Marks	CO
1	(a) What is the difference between Built up area and Super Built up area? (2 marks) (b) Consider a two storey RC residential building to be constructed at Kolkata on a rectangular plot of size 24m by 22m. Floor to floor height = 3.3m. The typical plan should include 2 Bedrooms, 1 kitchen, Toilets and other necessary components (to be considered suitably) as applicable. One bedroom in each floor should have an attached toilet. Draw a floor plan for the 1 st floor, Calculate Carpet area, Built-up area, Super Built-up area of each floor considering all the floors have identical features. (18 marks)	20	CO 4
2	(a) A two storey RC commercial building has floor to floor height 3m. The building has Dog legged staircase where nosing is not done. Draw typical detail of cross section of the flights of the staircase. (Take suitable dimensions when necessary). (12 marks) (b) What are the differences between RC Isolated Footing and Footing of a Load Bearing Masonry wall? Describe using neat sketches. (8 marks)	20	CO 3