B.E. CONSTRUCTION ENGINEERING THIRD YEAR SECOND SEMESTER EXAM 2023

SUBJECT: ESTIMATING & PRICING

Time : Three hours   Full Marks : 100

Use separate answer script for each Part
PART I (40 Marks)

	No. of Questions		Marks
CO2 & CO3	Q1.a)	Explain how the non-SOR items are determined in the estimation.	
	Q1. b)	Estimate the total carriage cost for transporting coarse and fine aggregates to Lataguri in Jalpaiguri district, if the cost for any distance upto 5 km from the nearest rail yard for each of the aggregates is 124. Assume a lead of 65 km from the New Jalpaiguri railyard. Use the following table for both kind of aggregates. | Distance	Carriage Rate (₹/m³)
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Above 5 km up to 10 km (per km)	10.90
Above 10 km up to 20 km (per km)	10.10
Above 20 km up to 50 km (per km)	9.50
Above 50 km up to 100 km (per km)	8.40		3 + 10
CO2 & CO3	Q2.a)	For an estimation work of a project of the Central Government, which rates are to be considered and why?	
	Q2.b)	Determine the supply rates of 40 mm, 20 mm, 10 mm aggregates and fine aggregate for transporting to Lataguri from the given data with carriage cost evaluated from Q.1b).	

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PART - I

Full Marks : 40

Aggregate size	Cost/m³ at New Jalpaiguri Rail yard (₹)	Loading/Unloading/ Excluding stacking charges (₹)	
40 mm Nominal graded Stone aggregate	1491.00	83.00	
20 mm Nominal graded Stone aggregate	1482.00	79.00	
10 mm Nominal graded Stone aggregate	1351.00	77.00	2+10
Fine aggregate	655.00	79.00	

CO3	Q.3.	For doing foundation work with PCC at a project in Lataguri, coarse aggregate of 20mm and 10mm size, fine aggregate and cement will be required. Volume of coarse and fine aggregate in the mix will be 50% and 40% respectively. 20mm and 10mm size aggregates will be mixed in the proportion of 60% and 40%. Estimate the cost of PCC per/m³. Supply rates and carriage costs of individual aggregates may be considered from Q.1.b) and 2.b). Assume supply rate of cement as ₹6056 per metric ton at the site. Assume any other relevant data as may be required.	15

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Different parts of the same question should be answered together.

PART II (60 Marks)

CO1 [30]	*Answer all questions in this block:* 1.(a) An RCC roof slab of overall size 7000 mm x 3000 mm & thickness 150 mm is provided with 10 mm diameter main bars bent up (45°) alternatively and placed at 150mm c/c .The distribution steel of 6mm diameter is provided @ 200mm c/c. Concrete cover is 15 mm on all sides. Find out the total quantity of plain steel. Prepare a bar bending schedule.

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OR

(b) Consider a beam of clear length of 4m, 300mm wide by 450mm depth. It consists of 2-12 diameter bars at top, and 2-16 diameter and 1 – 12 diameter bars at the bottom. Diameter of stirrup is 8mm spaced at 180mm center to center. Clear cover to reinforcement provided is 40mm. prepare a bar bending schedule for the fig. 1 (a) and fig. 1 (b) below.   [10]

2. (a) Work out quantities of earth work for a section of road as given in table

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Chainage (m)	0	20	40	60	80	100
Ground level (m)	101.60	101.00	99.50	98.50	98.60	99.80

Formation level at 0 m chainage =101.60 m.Gradient of formation line 1 in 350 upward. Top width of Formation 10.00m. Side slope 2.5:1.

OR

(b) The road has the following data. The Formation level at chainage zero is 27.5 and having the rising gradient of 1 in 200 the top width is 12m and the side slopes are 1½ horizontal to 1 vertical Assuming transverse slope is level calculate the volume of earth work.

Chainage	0	30	60	90	120
G.L in m	27.50	29.80	28.8	31.5	36.5

[10]

[3] (a) Estimate the quantities of the following items of two roomed
Building. Assume the room size, wall thickness and other datas.
(a) Earthwork in excavation in foundation
(b) Lime concrete in Foundation
(c) 1st class brick work in cement 1:6 in foundation and plinth
(d) 2.5cm cc dam proof courses and
(e) 1st class brick work in superstructure.

OR

Work out the quantity of following items for septic tank having internal size 1.4mX3.2m and height 1.4m.
1. Earthwork in excavation
2. P.C.C (1:3:6) 15 cm thick
3. B.B masonry in cement mortar (1:6) (300mm thick)
4. M15 slab on septic tank 12 cm thick.
5. The top of slab of septic tank is 15 cm above G.L   [10]

[Turn over

CO2 [5]	*Answer all questions in this block:* [4] (a) Describe the factors affecting rate analysis? Mention the types of overhead? [2] (b) Prepare a unit rate of (**ANY ONE**) (1) P.C.C (1:3:6) for 10 Cum. (2) R.C.C. (1:1.5:3) for 10.0 cu m. in slabs, beams and columns. (3) 12 mm thick cement plastering in cement mortar (1:4) for 100 sqm. [3]
CO3 [5]	*Answer all questions in this block:* [5] (a) Briefly explain requirement of specification. OR How to write a specification?. [2] (b) Write specification on (**ANY ONE**) (1) First Class building (2) Damp proof course. (3) Earthwork excavation and filling. [3]
CO4 [20]	Answer all questions in this block: [6] (a) Difference between Depreciation and obsolescence **OR** Salvage value and scrap Value.[4] (b)Define sinking fund and explain any method to determine sinking fund **OR** briefly describe types of depreciation and explain any method to determine depreciation. [12] (c) An old building has been purchased by a person at a cost of Rs. 10, 00,000 excluding the cost of land. Calculate the amount of annual sinking fund at 7.5% interest assuming the future life of the building as 40 years and the scrap value of the building as 12.5% of the cost of purchase.[4]

The students of the course should be able to
CO1: To estimate quantity of materials of different civil engineering structures. (K3)
CO2: To analyse the rate analysis, bill preparations, overhead and profit.(K4)
CO3: To prepare the specification. (K3)
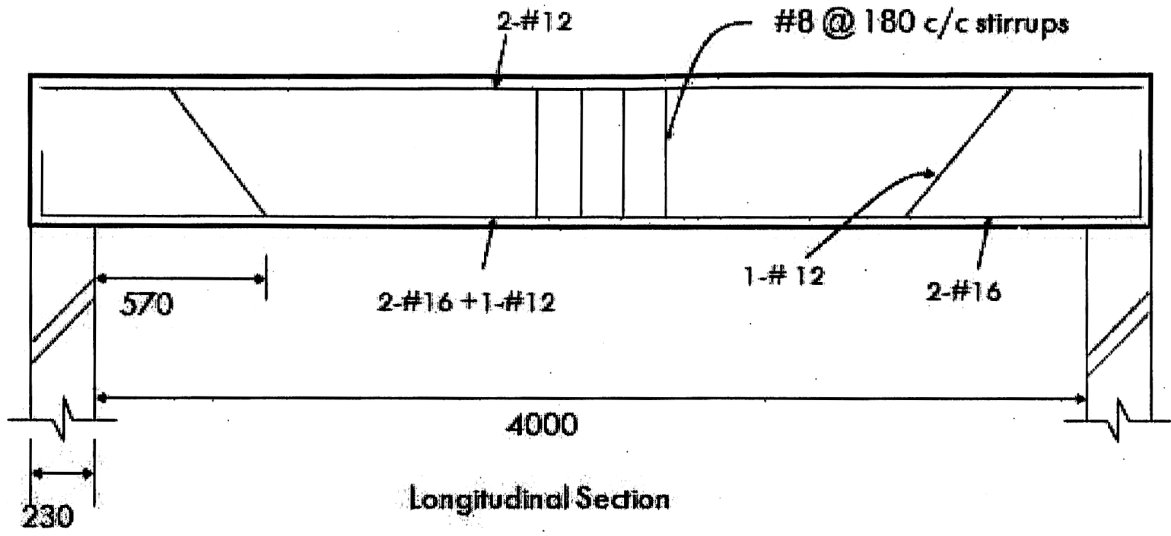CO4: To understand the valuation of rental, land and buildings. (K2)

2-#12   #8 @ 180 c/c stirrups

570   2-#16 +1-#12   1-# 12   2-#16

4000

230

Longitudinal Section

Fig 1 (a): RCC Beam Reinforcement Details
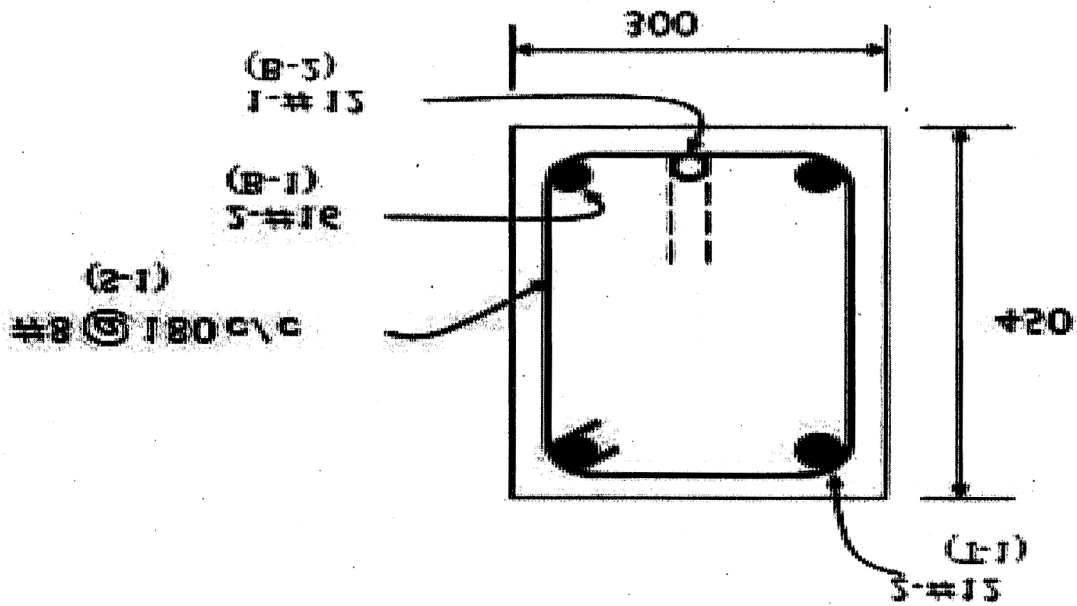
300

(B-5)
1-# 15

(B-1)
5-#16

(2-1)
#8 ⑤ 180 c\c

+20

(1-1)
5-#15

Fig 1 (b) : RCC Beam Cross-Section