



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF BUILT ENVIRONMENT
DEPARTMENT ARCHITECTURE
STRUCTURAL DESIGN - I
AAR 2205

Second Semester Examination Paper
May 2015

This examination paper consists of 5 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: GRAPH PAPER

Examiner's Name: Eng. V.V.DESAI

INSTRUCTIONS

1. Answer all questions
2. Each question carries 25 marks
3. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	40
2.	25
3.	25
4.	25
TOTAL	100

QUESTION 1

A simply supported beam spanning 8m has a uniformly distributed characteristic dead and characteristic live load of 20kN/m and 10kN/m respectively. Assuming the beam is fully restrained

laterally select a suitable UB section in Grade 43 steel.

Marks [40]

QUESTION 2

A short column supports a characteristic dead load of 650kN and a characteristic live load of 450kN, the size of the column being 250mm x 250mm. Using grade 30 concrete and grade 460 reinforced design a reinforced concrete base, Assume the soil bearing pressure to be 200kN/m².

Marks [30]

QUESTION 3

The following figure shows one flight of stairs.

Dimensions of the flight are

a=600mm, b=2500mm, c=1200mm

Going=250mm, Total rise=1900, Rise(each step)= 172.7mm: 10 treads=2500mm

Landings h=175mm, flight waist=200mm

LOADING

Imposed 4.0 kN/m²; Finishes 1.3 kN/m²

Calculate the ultimate design load and Reactions R1 and R2.

MATERIALS

Concrete: Grade 30, Reinforcement Grade 460

