



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF BUILT ENVIRONMENT

DEPARTMENT ARCHITECTURE

STRUCTURAL DESIGN – II

AAR 2205

Main Examination Paper

May 2015

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements:

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

INSTRUCTIONS

1. Answer all questions
2. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	40
2.	30
3.	30
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/mm²

Calculate the ultimate design load and Reactions R1 and R2.

MATERIALS

Concrete: Grade 30, Reinforcement Grade 460

