

MANIPAL UNIVERSITY

FIFTH SEMESTER B. ARCH. DEGREE EXAMINATION – FEBRUARY 2016

SUBJECT: ARC 305 - BUILDING CODES AND BYELAWS (2010 SCHEME)

Thursday, February 18, 2016

Time: 10:00 – 13:00 Hrs.

Max. Marks: 50

- ✗ Answer any FIVE questions.
- ✗ Assume suitable data wherever necessary.

1. Draw site plan and site elevations indicating the building volume for the following:

Use: Industrial

Site: 60M x 80M (shorter side facing the access road)

R.O.W.: 24M

Maximise F.A.R. Consumption.

(10 marks)

2. Draw ground floor plan and typical floor plan showing fire exit requirements. Draw detailed plan and section of fire staircase in 1:50 scale.

Use: Shopping Mall

Site: 40m x 60m (shorter side abutting the road)

ROW: 18m

Maximize FAR

(10 marks)

3. Write short notes on the following with neat sketches:

3A. Importance of barrier free design

3B. Measures for fire safety in a multistory building

(5 marks × 2 = 10 marks)

- 4A. Draw the plan and section of a typical 4-lane sub arterial road with two way traffic.

4B. Elaborate on CRZ-I

(5+5 = 10 marks)

5. Draw toilet layout showing-fixtures, doors and windows for the following:

Use: museum

Visitors: 1500

Staff: 25

No external walls

(10 marks)

6. Write short notes with sketches:

6A. Building envelope

6B. Kerb

6C. Design guidelines for ventilation in Industrial building

6D. Refuse Chute

6E. Angular parking

(2 marks × 5 = 10 marks)

Table 21 Occupants per Unit Exit Width
(Clauses 4.4.2, 4.4.3 and C-1.6.2)

Sl No.	Group of Occupancy	Number of Occupants		
		Stairways	Ramps	Doors
(1)	(2)	(3)	(4)	(5)
i)	Residential (A)	25	50	75
ii)	Educational (B)	25	50	75
iii)	Institutional (C)	25	50	75
iv)	Assembly (D)	40	50	60
v)	Business (E)	50	60	75
vi)	Mercantile (F)	50	60	75
vii)	Industrial (G)	50	60	75
viii)	Storage (H)	50	60	75
ix)	Hazardous (J)	25	30	40

Table 22 Travel Distance for Occupancy and Type of Construction
(Clauses 4.4.1, 4.5.1 and 4.5.2)

Sl No.	Group of Occupancy	Maximum Travel Distance Construction	
		Types 1 & 2 m	Types 3 & 4 m
(1)	(2)	(3)	(4)
i)	Residential (A)	30.0	22.5
ii)	Educational (B)	30.0	22.5
iii)	Institutional (C)	30.0	22.5
iv)	Assembly (D)	30.0	30.0
v)	Business (E)	30.0	30.0
vi)	Mercantile (F)	30.0	30.0
vii)	Industrial (G)	45.0	"
viii)	Storage (H)	30.0	"
ix)	Hazardous (J)	22.5	"

Table 20 Occupant Load
(Clause 4.3)

Sl No.	Group of Occupancy	Occupant Load, Floor Area in m ² /Person
(1)	(2)	(3)
i)	Residential (A)	12.5
ii)	Educational (B)	4
iii)	Institutional (C)	15 (see Note 1)
iv)	Assembly (D)	
a)	With fixed or loose seats and dance floors	0.6 (see Note 2)
b)	Without seating facilities including dining rooms	1.5 (see Note 2)
v)	Mercantile (F)	
a)	Street floor and sales basement	3
b)	Upper sale floors	6
vi)	Business and industrial (E&G)	10
vii)	Storage (H)	30
viii)	Hazardous (J)	10

TABLE - 2

Minimum Front, Rear and Side setbacks for all types of buildings upto 10 M height except industrial buildings

Sl. No.	Proposed Road width	Minimum Front setbacks	Building line from center of road
1.	Up to 6.0 M	1.5 M	4.5 M
2.	7.5 M	2.0 M	5.75 M
3.	9.0 M	2.0 M	6.5 M
4.	12.0 M	3.5 M	9.5 M
5.	18.0 M	3.5 M	12.5 M
6.	24.0 M	3.5 M	15.5 M
7.	30.0 M	4.0 M	19.0 M

The Rear and Side setbacks shall be 10% of the depth and width of the plots respectively.

TABLE - 3

Exterior open spaces/set backs for all types of buildings above 10 M in height except industrial buildings

Sl. No.	Height of Buildings (M)	Minimum exterior open spaces/set backs to be left on	
		Front (M)	Rear and Sides (M)
1	Above 10 upto 12	4.0	4.0
2	Above 12 upto 15	4.0	5.0
3	Above 15 upto 18	5.0	6.0
4	Above 18 upto 21	5.0	6.0
5	Above 21 upto 24	6.0	7.0
6	Above 24 upto 27	6.0	8.0
7	Above 27 upto 30	7.0	9.0
8	Above 30 upto 35	7.0	10.0
9	Above 35 upto 40	8.0	11.0
10	Above 40 upto 45	8.0	12.0
11	Above 45 upto 50	9.0	13.0
12	Above 50 upto 55	9.0	14.0
13	Above 55	10.0	16.0

Table 12 Art Galleries, Libraries and Museums

(Clause 5.2.5.1)

Sl No.	Fixtures	Public		Staff	
		Male	Female	Male	Female
(1)	(2)	(3)	(4)	(5)	(6)
i)	Water-closets	1 per 200 up to 400 Over 400 add at 1 per 250 or part thereof	1 per 100 up to 200 Over 200 add at 1 per 150 or part thereof	1 for up to 15 2 for 16-35	1 for up to 12 2 for 13-25
ii)	Ablution tap	One in each water-closet	One in each water-closet	One in each water-closet	One in each water-closet
		1 water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water-closets and urinals			
iii)	Urinals	1 per 50	—	Nil up to 6 1 per 7 to 20 2 per 21-45	—
iv)	Washbasins	1 for every 200 or part thereof. For over 400, add at 1 per 250 persons or part thereof	1 for every 200 or part thereof. For over 200, add at 1 per 150 persons or part thereof	1 for up to 15 2 for 16-35	1 for up to 12 2 for 13-25
v)	Drinking water fountain	1 per 100 persons or part thereof			
vi)	Cleaner's sink	1 per floor, Min			
vii)	Showers/Bathing rooms	As per requirements			

NOTES

1 Some WC's may be European style if desired.

2 Male population may be assumed as two-third and female population as one-third.

TABLE FOR FAR CALCULATION - COMMERCIAL BUILDINGS

Plot Area (M ²)	Plot Coverage Maximum	Permissible FAR	Road M)
			Proposed
(1)	(2)	(3)	(7)
Upto 240	75%	1.25	6
Over 240 Upto 500	75%	1.50	9
Over 500 Upto 750	70%	1.50	9
Over 750 Upto 1,000	70%	1.75	12
Over 1,000 upto 2000	65%	2.25	18
Over 2,000 upto 4000	65%	2.25	18
Over 4000 upto 6000	60%	2.50	24

Setbacks, coverage, floor area ratio, etc., for Industrial buildings

Plot area (M ²)	Maximum Plot coverage	Floor Area Ratio	Minimum Front setback (M)	Set backs on other sides (M)	Minimum road width (M)
Upto 230	60%	1.25	1.00	1.00	Upto 6.0
231 to 1000	60%	1.50	4.50	3.00	Over 6.0
1001 to 2000	50%	1.50	6.00	5.00	Over 9.0
2001 to 4000	40%	1.75	8.00	5.00	Over 12.0
4001 to 8000	35%	1.50	8.00	6.00	Over 15.0
Above 8000	30%	1.25	15.00	12.00	Over 15.0

