L-3/T-2/ARCH **Date : 31/01/2016**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch. Examinations 2013-2014

Sub : **ARCH 353** (Urban Design - I)

Full Marks: 140 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

There are **FIVE** questions in this section. Answer **Q. No. 5** any **THREE** from the rest.

1. Define 'Urban Design'. Discuss the three principle orientations in 'Urban Design' with suitable examples. **(4+12=16)**

2. "Greek Agora and Roman Republican Forum laid the foundation of Urban Design" — discuss the statement with illustrative examples. Discuss the pattern and context of 'Chauk' and 'Agora'. **(10+6=16)**

3. With the socio-cultural perspective of 19^{th} and 20^{th} century Urban Design, discuss the territorial transformation. **(16)**

4. List the elements that are necessary in any Urban Design undertaking. Elaborate on 'circulation and parking' including pedestrian ways. **(8+8=16)**

5. Write note on any two of the following: **(11×2=22)**
   (a) Travel Demand Analysis
   (b) Quality of Environment as the domain of Urban Design.
   (c) Sequence and Spatial Organization.

SECTION – B

There are **FIVE** questions in this section. Answer **Q. No. 10** any **THREE** from the rest.

6. Urban design is applicable at various levels; list and discuss the 'Basics' and 'Attributes' of Urban Design at each level. **(16)**

7. Elaborate on the domains of Urban Design with which a professional urban designer deal with. Provide necessary illustrations. **(16)**

8. Define 'scale' in Urban Design and discuss its relationship with "Urban mass", "Urban enclosure" and "Urban space". **(16)**

9. "Road Pattern of a city is the skeleton of its body." Discuss the statement and list different shapes of the city with proper lebelling. **(16)**

10. Write notes on any two of the following urban design criteria. **(11×2=22)**
    (a) Measurable Urban Design Criteria.
    (b) Non-Measurable Urban Design Criteria.
    (c) Generic Urban Design Criteria.

L-3/T-2/ARCH **Date : 17/01/2016**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch Examinations 2013-2014

Sub : **CE 367** (Structure IV: Steel and Timber Structures)

Full Marks: 140 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

Assume reasonable values for missing data, if any.

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Prove that for a rectangular beam section, maximum shear stress is $\frac{3V}{2A}$. **(8 ⅓)**

   (b) Select the lightest W12 section of A36 steel for a column subjected to an axial compression of 380 kips. Assume the member is hinged at the top and fixed at the bottom for bending about either principal axis. Use AISC/ASD specification. Table for design properties is given in Annexure-1. **(15)**

2. (a) Write short notes on **(8 ⅓)**

   (i) Effective length factor

   (ii) Cellular makeup of woods

   (iii) Slenderness ratio of timber beam, R_B

   (b) Two 2" × 10" × 10' Visually Graded No. 1 Redwood is to be used together as a single beam. The beam is used in wet conditions and normal temperature, and is simply supported at each end and is laterally supported along its length. Uniformly distributed dead load on the beam is 600 lb/ft. **(3+7+5)**

   (i) Locate the section where maximum bending stress develops and determine the magnitude of maximum bending stress on the section.

   (ii) Determine the allowable bending stress, F'_b for the beam

   (iii) Based on the answers from (i) and (ii), determine if the beam is adequate for supporting the load. If not, determine the number of additional 2" × 10" lumbers that are needed to reduce the bending stress below the allowable limit.

   Use Annexure 2 and 3.

3. (a) Neatly sketch and label different types of steel sections which are available in the market. **(8 ⅓)**

   (b) (i) What are the factors to be considered for the design of wood beams? **(3+7+5)**

   For the timber beam (two 2" × 10" × 10') mentioned in Question 2(b),

Contd P/2

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Contd... Q. No. 3(b)

(ii) Locate the section where the maximum value for shear force is observed. Compute the maximum shear stress and check whether it is within the allowable limit.

(iii) Calculate the maximum deflection due to dead load.

4. (a) Briefly explain the classification of sawn lumber. **(8 ⅓)**

(b) Computer the axial load carrying capacity of the column section shown in Fig. 1. the column is fixed-pinned connected about both axes. Length of the column is 24 feet. Assume A36 steel. **(10)**

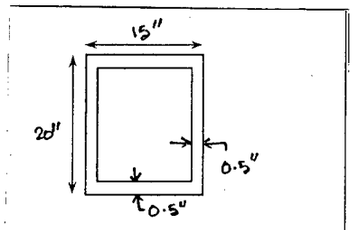

Fig 1: Cross section of column

(c) Write a short note on lateral stability of timber beam. **(5)**

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. Following data are given for the question below: **(23 ⅓)**

CGI roofing = 2.0 psf
Self weight of purlins = 1.5 psf
Sagrod weight = negligible
Spacing between adjacent trusses = 25 ft
Design wind pressure:
Windward side = -3.96 psf
Leeward side = -18.82 psf
Trial section for purlin (A36 steel):
(1) C 4x5.4 (S_{xx} = 1.10 inch^3 & S_{yy} = 0.202 inch^3)
(2) C 6x13 (S_{xx} = 5.80 inch^3 & S_{yy} = 0.642 inch^3)
(3) C 7x9.8 (S_{xx} = 6.08 inch^3 & S_{yy} = 0.625 inch^3)

Sagrod is provided at half the distance in between trusses.

Consider X-axis in the plane of roofing and Y-axis in the perpendicular direction of the plane of roofing. Equation for moment about X-axis is $wL^2/8$ and moment about Y-axis is $wL^2/32$.

Contd P/3

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Contd... Q. No. 5

Check the adequacy of the trial purlin sections considering both dead load and wind load for the truss shown in Figure-2. Comment on, whether the sections (1), (2), (3) are adequate or not.

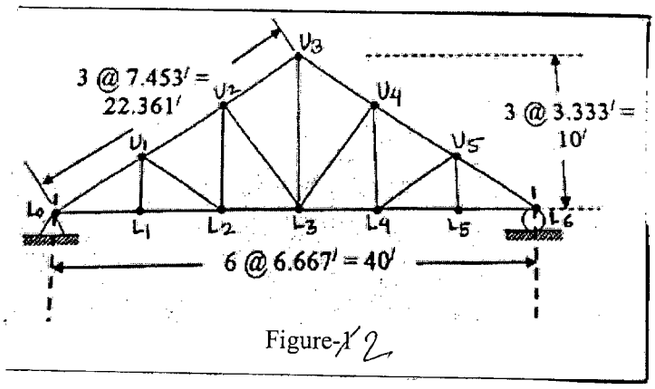

Figure-1/2

6. (a) Draw a simple roof truss and show different components on it. **(5)**

(b) Design the following members of an industrial roof truss (shown in Figure-2) from the load table given below. **(18⅓)**

Member	Member Force (kip)		
	Dead load (kip	Wind (left-to-right) (kip)	Wind (right-to-left) (kip)
L_0U_1	–15.8	16.0	34.1
L_0L_1	14.2	4.5	–47.2
U_2L_3	9.5	–4.2	–3.4

7. (a) Write down the assumptions of truss analysis. **(5)**

(b) Suppose, members L_0U_1 and U_1U_2 of Figure-2 are designed to be L $3\frac{1}{2} \times 3 \times \frac{1}{4}$. At node U_1, both of them are connected to a gusset plate of thickness $\frac{6}{16}$ inch. Design fillet weld for this connection when load table is given below: **(18⅓)**

Member	Member Force (kip)		
	Dead load (kip	Wind (left-to-right) (kip)	Wind (right-to-left) (kip)
L_0U_1	–15.8	16.0	34.1
U_1U_2	–12.6	17.7	25.0

Use Annexure 4 and 5.

Contd P/4

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8. Calculate the joint loads for dead load and wind load (show the loading diagram with loads at the joint) for 40 ft span interior truss of an industrial building (Figure-2). Spacing between two adjacent trusses (bay) is 25 ft. Show the loads with neat sketches. **(18 ⅓)**

Given:

Loads:

a) CGI Sheet Roofing = 2.0 psf
b) Purlins = 1.5 psf
c) Sagrod + Bracing = 1.0 psf
d) Self weight of Truss = 60 lb/ft of horizontal span

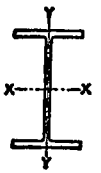
Design wind speed = 210 km/h
Wall height = 12 ft
$C_c = 47.2 \times 10^{-6}$
$q_z = C_c\, C_l\, C_z V_b^2$
$p_z = C_G\, C_{pe}\, q_z$
$1 KN/m^2 = 20.88$ psf

Other charts are enclosed with the question (Annexure 6, 7 and 8).

ANNEXURE 1

WF SHAPES

PROPERTIES FOR DESIGNING



Nominal Size	Weight per Foot	Area	Depth	Flange		Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Thickness		I	$\frac{I}{c}$	k	I	$\frac{I}{c}$	k
In.	Lb.	In.²	In.	In.	In.	In.	In.⁴	In.³	In.	In.⁴	In.³	In.
14 x 8	53	15.59	13.94	8.062	.658	.370	542.1	77.8	5.90	57.5	14.3	1.92
	48	14.11	13.81	8.031	.593	.339	484.9	70.2	5.86	51.3	12.8	1.91
	43	12.65	13.68	8.000	.528	.308	429.0	62.7	5.82	45.1	11.3	1.89
14 x 6¾	38	11.17	14.12	6.776	.513	.313	385.3	54.6	5.87	24.6	7.3	1.49
	34	10.00	14.00	6.750	.453	.287	339.2	48.5	5.83	21.3	6.3	1.46
	30	8.81	13.86	6.733	.383	.270	289.6	41.8	5.73	17.5	5.2	1.41
12 x 12	190	55.86	14.38	12.670	1.736	1.060	1892.5	263.2	5.82	589.7	93.1	3.25
	161	47.38	13.88	12.515	1.486	.905	1541.8	222.2	5.70	486.2	77.7	3.20
	133	39.11	13.38	12.365	1.236	.755	1221.2	182.5	5.59	389.9	63.1	3.16
	120	35.31	13.12	12.320	1.106	.710	1071.7	163.4	5.51	345.1	56.0	3.13
	106	31.19	12.88	12.230	.986	.620	930.7	144.5	5.46	300.9	49.2	3.11
	99	29.09	12.75	12.190	.921	.580	858.5	134.7	5.43	278.2	45.7	3.09
	92	27.06	12.62	12.155	.856	.545	788.9	125.0	5.40	256.4	42.2	3.08
	85	24.98	12.50	12.105	.796	.495	723.3	115.7	5.38	235.5	38.9	3.07
	79	23.22	12.38	12.080	.736	.470	663.0	107.1	5.34	216.4	35.8	3.05
	72	21.16	12.25	12.040	.671	.430	597.4	97.5	5.31	195.3	32.4	3.04
	65	19.11	12.12	12.000	.606	.390	533.4	88.0	5.28	174.6	29.1	3.02
12 x 10	68	17.06	12.19	10.014	.641	.359	476.1	78.1	5.28	107.4	21.4	2.51
	58	15.59	12.06	10.000	.576	.345	426.2	70.7	5.23	96.1	19.2	2.48
12 x 8	50	14.71	12.19	8.077	.641	.371	394.5	64.7	5.18	56.4	14.0	1.96
	45	13.24	12.06	8.042	.576	.336	350.8	58.2	5.15	50.0	12.4	1.94
	40	11.77	11.94	8.000	.516	.294	310.1	51.9	5.13	44.1	11.0	1.94
12 x 6½	36	10.59	12.24	6.565	.540	.305	280.8	45.9	5.15	23.7	7.2	1.50
	31	9.12	12.09	6.525	.465	.265	238.4	39.4	5.11	19.8	6.1	1.47
	27	7.97	11.95	6.500	.400	.240	204.1	34.1	5.06	16.6	5.1	1.44

ANNEXURE 2

Moisture Content Factors C_M [a,b,e]								
Strength Property	Fb	Ft	Fc	$Fc^{\perp}$	Fv	E	Frt	Fg
Sawn Lumber, Visual or Machine Graded Wet conditions of use MC > 19% Dimension lumber (including Southern Pine)	0.85[a]	1.00	0.80[b]	0.67	0.97	0.90	--	--d
5 in. X 5 in. and larger	1.00	1.00	0.91	0.67	1.00	1.00	--	--d
Decking Wet conditions if use all Species except Southern Pine[c]	0.85	--	--	0.67	--	0.90	--	--

Notes:
a) When $(F_b)(C_F)$ for dimension lumber of all species ≤ 1150 psi, $C_M = 1.0$.
b) When $(F_c)(C_F)$ for dimension lumber of all species except Southern Pine ≤ 750 psi, $C_M = 1.0$; when F_c for visually graded Southern Pine ≤ 750 psi, $C_{f,t} = 1.0$.
c) For Southern Pine, use Reference design values for wet service conditions

SIZE FACTORS, C_F- for Sawn Lumber not including Southern Pine					
		F_b		F_t	F_c
Grades	Width/Depth	Thickness			
		2" & 3"	4"		
Select Structural, No.1 & Btr. No. 1, No. 2, No. 3	2",3"&4"	1.5	1.5	1.5	1.15
	5"	1.4	1.4	1.4	1.1
	6"	1.3	1.3	1.3	1.1
	8"	1.2	1.3	1.2	1.05
	10"	1.1	1.2	1.1	1.0
	12"	1.0	1.1	1.0	1.0
	14" & Wider	0.9	1.0	0.9	0.9
Stud	2", 3" & 4"	1.1	1.1	1.1	1.05
	5" & 6"	1.0	1.0	1.0	1.0
Construction & Standard	2", 3, & 4"	1.0	1.0	1.0	1.0
Utility	4"	1.0	1.0	1.0	1.0
	2" & 3"	0.4	--	0.4	0.6

ANNEXURE 3

Frequently Used Load Durations Factors C_D[1]		
Load Duration	**C_D**	**Typical Design Loads**
Permanent (>10 yrs)	0.9	Dead Load
Ten Years (Normal)	1.0	Occupancy Live Load
Two Months	1.15	Snow Load
Seven Days	1.25	Construction Load (Roof Included)
Ten Minutes	1.6	Wind/Earthquake Load
Impact[2]	2.0	Impact Load

TEMPERATURE FACTORS, C_t				
Design Values	In Service Moisture Conditions	C_t T≤100°F	C_t 100°F<T≤125°F	C_t 125°F<T≤150°F
F_t, E	Wet or Dry	1.0	0.9	0.9
F_b, F_v, F_c and $F_{c\perp}$	Dry	1.0	0.8	0.7
F_b, F_v, F_c and $F_{c\perp}$	Wet	1.0	0.7	0.5

Design Values for Visually Graded Dimension Lumber (2"-4" thick) Except Southern Pine* **								
Species and commercial grade	Size classification	Bending Fb	Tension parallel to grain Ft	Shear parallel to grain Fv	Compression perpendicular to grain Fc1	Compression parallel to grain Fc	Modulus of Elasticity E	Minimum Modulus of Elasticity Emin
Redwood								
Clear Structural		1750	1000	160	650	1850	1400000	510000
Select Structural		1350	800	160	650	1500	1400000	510000
Select Structural, open grain		1100	625	160	425	1100	1100000	400000
No. 1		975	575	160	650	1200	1300000	470000
No.1, open grain		775	450	160	425	900	1100000	400000
No. 2	2" & wider	925	525	160	650	950	1200000	440000
No.2, open grain		725	425	160	425	700	1000000	370000
No. 3		525	300	160	650	550	1100000	400000
No.3, open grain		425	250	160	425	400	900000	330000
Stud		575	325	160	425	450	900000	330000
Construction	2" & wider	825	475	160	425	925	900000	330000
Standard		450	275	160	425	725	900000	330000
Utility	2"- 4" wide	225	125	160	425	475	800000	290000
Spruce-Pine-Fir								
Select Structural		1250	700	135	425	1400	1500000	550000
No. 1/No. 2	2" & wider	875	450	135	425	1150	1400000	510000
No. 3		500	250	135	425	650	1200000	440000
Stud	2" & wider	675	350	135	425	725	1200000	440000
Construction		1000	500	135	425	1400	1300000	470000
Standard	2"- 4" wide	550	275	135	425	1150	1200000	440000
Utility		275	125	135	425	750	1100000	400000

4

Annexure 1: Minimum size of fillet weld

Minimum fillet weld size (inch)	Maximum thickness of part (inch)
1/8	To 1/4 inclusive
3/16	Over 1/4 to 1/2
1/4	Over 1/2 to 3/4
5/16	Over 3/4 to 1½
3/8	Over 1½ to 2¼
1/2	Over 2¼ to 6
5/8	Over 6

5

Annexure 2: Maximum size of fillet weld

Maximum fillet weld size (inch)	Minimum thickness of part (inch)
Thickness of material	Less than 1/4 inch
(Thickness of material - 1/16 inch)	1/4 inch & over 1/4 inch

6

Annexure-3

External Pressure Coefficients, C_{pe} for Roof †

Wind Direction	h/L	Windward Side θ (degrees) 0	10-15	20	30	40	50	> 60	Leeward Side
Normal to ridge	≤ 0.3	- 0.7	0.2* -0.9*	0.2	0.3	0.4	0.5	0.01 θ	- 0.7 for all values of h/L and θ
	0.5	- 0.7	- 0.9	- 0.75	- 0.2	0.3	0.5	0.01 θ	
	1.0	- 0.7	- 0.9	- 0.75	- 0.2	0.3	0.5	0.01 θ	
	≥ 1.5	- 0.7	- 0.9	- 0.9	- 0.9	- 0.35	0.2	0.01 θ	
Parallel to ridge	h/B or h/L ≤ 2.5				- 0.7				- 0.7
	h/B or h/L > 2.5				- 0.8				- 0.8

† Coefficients are to be used with $p_h = C_G C_{pe} q_h$, see Sec 2.4.6.6(a)

* Both values of C_{pe} shall be used for load calculations.

Note: (1) These coefficients shall be used with Method 1, Sec 2.4.6.4.(a).
(2) Refer to Table 6.2.13 for arched roofs.
(3) For flexible buildings and structures, use appropriate $\bar{G}$ as determined by Sec 2.4.6.6 (c).
(4) Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
(5) Linear interpolation may be made for values of θ, h/L, and L/B ratios other than listed.

Annexure-~~A~~ B

Combined Height and Exposure Coefficient, C_z

Height above ground level, z (metres)	Coefficient, C_z (1)		
	Exposure A	Exposure B	Exposure C
0-4.5	0.368	0.801	1.196
6.0	0.415	0.866	1.263
9.0	0.497	0.972	1.370
12.0	0.565	1.055	1.451
15.0	0.624	1.125	1.517
18.0	0.677	1.185	1.573
21.0	0.725	1.238	1.623
24.0	0.769	1.286	1.667
27.0	0.810	1.330	1.706
30.0	0.849	1.371	1.743
35.0	0.909	1.433	1.797
40.0	0.965	1.488	1.846
45.0	1.017	1.539	1.890
50.0	1.065	1.586	1.930
110.0	1.513	1.987	2.260
120.0	1.572	2.037	2.299
130.0	1.629	2.084	2.337
140.0	1.684	2.129	2.371
150.0	1.736	2.171	2.404
160.0	1.787	2.212	2.436
170.0	1.835	2.250	2.465
180.0	1.883	2.287	2.494
190.0	1.928	2.323	2.521
200.0	1.973	2.357	2.547
220.0	2.058	2.422	2.596
240.0	2.139	2.483	2.641
260.0	2.217	2.541	2.684
280.0	2.910	2.595	2.724
300.0	2.362	2.647	2.762

Note : (1) Linear interpolation is acceptable for intermediate values of z.

L-3/T-2/ARCH **Date : 23/01/2016**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch Examinations 2013-2014

Sub : **ARCH 377** (Urban Anthropology)

Full Marks: 140 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

There are **FIVE** questions in this section. Answer any **FOUR**.

1. What is Anthropology? Briefly discuss the sub-disciplines of Anthropology. **(17½)**

2. What do you understand by anthropological methods of research? Briefly describe the types of anthropological research methods. **(17½)**

3. "Anthropologists study the full breadth of human existences, past and present" — Discuss. **(17½)**

4. What do you know about Interview Techniques? Discuss the conditions for successful Interview. **(17½)**

5. Write short notes on **any two** of the following: **(17½)**
   (a) Urbanism in Ecological perspectives
   (b) Urban personality and collective behavior.
   (c) Urban Fieldwork.

SECTION – B

There are **FIVE** questions in this section. Answer any **FOUR**.

6. Discuss the origin and development of Architectural research. **(17½)**

7. What is housing research? Explain the main features of housing research. **(17½)**

8. Discuss the relationship between habitat research and architectural anthropology. **(17½)**

9. What do you understand by urban community study? Discuss the role of traditional ethnographic analysis approach for urban community study. **(17½)**

10. Write short notes (any two) **(17½)**
    (a) Urban Ethnology
    (b) Biographic Techniques
    (c) Habitat theory of culture

L-3/T-2/ARCH **Date : 23/01/2016**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch Examinations 2013-2014

Sub : **ARCH 397** (Interior Design)

Full Marks: 140 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

There are **FOUR** questions in this section. Answer Q. No. 4 and any **TWO** from the rest.

1. Explain in details how design of interior spaces requires an understanding of building "system of structures" and "enclosures" — Give necessary sketches. **(20)**

2. How do floor, wall and ceiling plans define and isolate portion of spaces? Explain with diagrams. **(20)**

3. Name and draw various types of ceiling used in interior spaces. **(20)**

4. (a) How does scale of window relate to the surrounding wall planes and human scale? Explain with details drawing. **(30)**

   (b) Name and draw different types of door system? How does door systems affect space planning?

SECTION – B

There are **FOUR** questions in this section. Answer Q. No. 8 and any **TWO** from the rest.

5. What factors are responsible for discerning shape, colour and texture of objects in addition to the amount of light available for illumination? Explain with neat sketches. **(20)**

6. "The form of distribution of light depends on the design of the fixture as well as its placement and orientation in a space" — Elaborate with drawings. Name different types of light fixtures and its placement in ceiling and wall. **(20)**

7. Name different types of finish flooring applied on top of hard flooring. Explain in details with necessary drawings. **(20)**

8. Draw and explain different types of walls and partitions used to create/separate spaces within a building. How variation and height of opening give different senses of spaces in indoor? **(30)**

L-3/T-2/ARCH **Date : 27/01/2016**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-2 B. Arch. Examinations 2013-2014

Sub : **EEE 373** (Building Services III: Electrical)

Full Marks: 140 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Define any 5 (five) of the following with necessary diagrams: **(10)**

   (i) Alternating Current (AC) (ii) Period (iii) Cycle (iv) Phase (v) Phase-difference (vi) Frequency and (vii) Angular Frequency.

   (b) (i) Find the complete impedance expression for a RL branch, where R = 10 ohms, L = 0.05 henry, f = 25 c/s and V_m = 150 volts. **(4)**

   (ii) Write the expression for the supply voltage as a function of time taking **(5 ⅓)**

   $$v = 75 \text{ volts at } t = 0 \left(\frac{dv}{dt} \text{ positive}\right)$$

   (iii) Write the expression for current as a function of time, assuming that the voltage in the above (ii) is applied to the branch. Employ numerical coefficients. **(4)**

2. (a) What are the important factors that are to be considered before Designing of the System of Wiring of a very large Electrical Installation. Describe them in brief. **(11)**

   (b) What are the salient points that are to be considered before going to complete an "Electrical Fittings and Fixture Layout Drawing" of a large high rise building. Describe them in brief. **(12 ⅓)**

3. Write short notes on any 2(two) of the following: **(2×11⅔=23 ⅓)**

   (a) Safety of Men and Machines

   (b) Lighting Protection System of a High Rise Building

   (c) Earthing Systems for different Electrical Installations.

4. For the "Fittings and Fixture Layout Drawing shown in Fig. 4(a).

   (a) Draw the detailed "Conduit Layout Design" in Fig. 4(b) and attach the sheet with your "Answer Script", **(12)**

   (b) Show the "Switch-Board Connection Diagram" of the above design, **(6)**

   (c) Show the "Circuit Diagram" of above design **(2 ⅓)**

   (d) Show the necessary "Legends" for your drawings,. **(3)**

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SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) With simple example(s)/diagram(s) define any 5 (five) of the followings: **(10)**

   (i) Ohm's Law

   (ii) Electrical Network

   (iii) Kirchoff's current law

   (iv) Kirchoff's voltage law

   (v) Non-Linear circuit

   (vi) Thyrite (conductor)

   (b) Using Delta-Wye (Δ-Y) Transformation, find the current, I_0 of the Fig. for Q. No. 5(b). **(13 ⅓)**

6. (a) Using branch current method, find the current in each branch of the network in Fig. for Q. No. 6(a). **(11)**

   (b) In the network shown in Fig. for Q. No. 6(b), calculate the loop currents I_1, I_2 and I_3. **(12 ⅓)**

7. (a) Calculate the equivalent resistance R_{AB} of the circuit shown in Fig. for Q. No. 7(a). Also calculate the current I_0. **(10)**

   (b) Using "Superposition Theorem", find the current I_{AB} in the branch AB of the circuit shown in Fig. for Q. No. 7(b). **(13 ⅓)**

8. (a) Using "Thevenin's Theorem", find the current through the branch AB of the circuit shown in Fig. for Q. No. 8(a). **(12 ⅓)**

   (b) Using "Norton's Theorem", find the current in the branch AB of the circuit shown in Fig. for Q. No. 8(b). **(11)**

Contd. . . . P/3

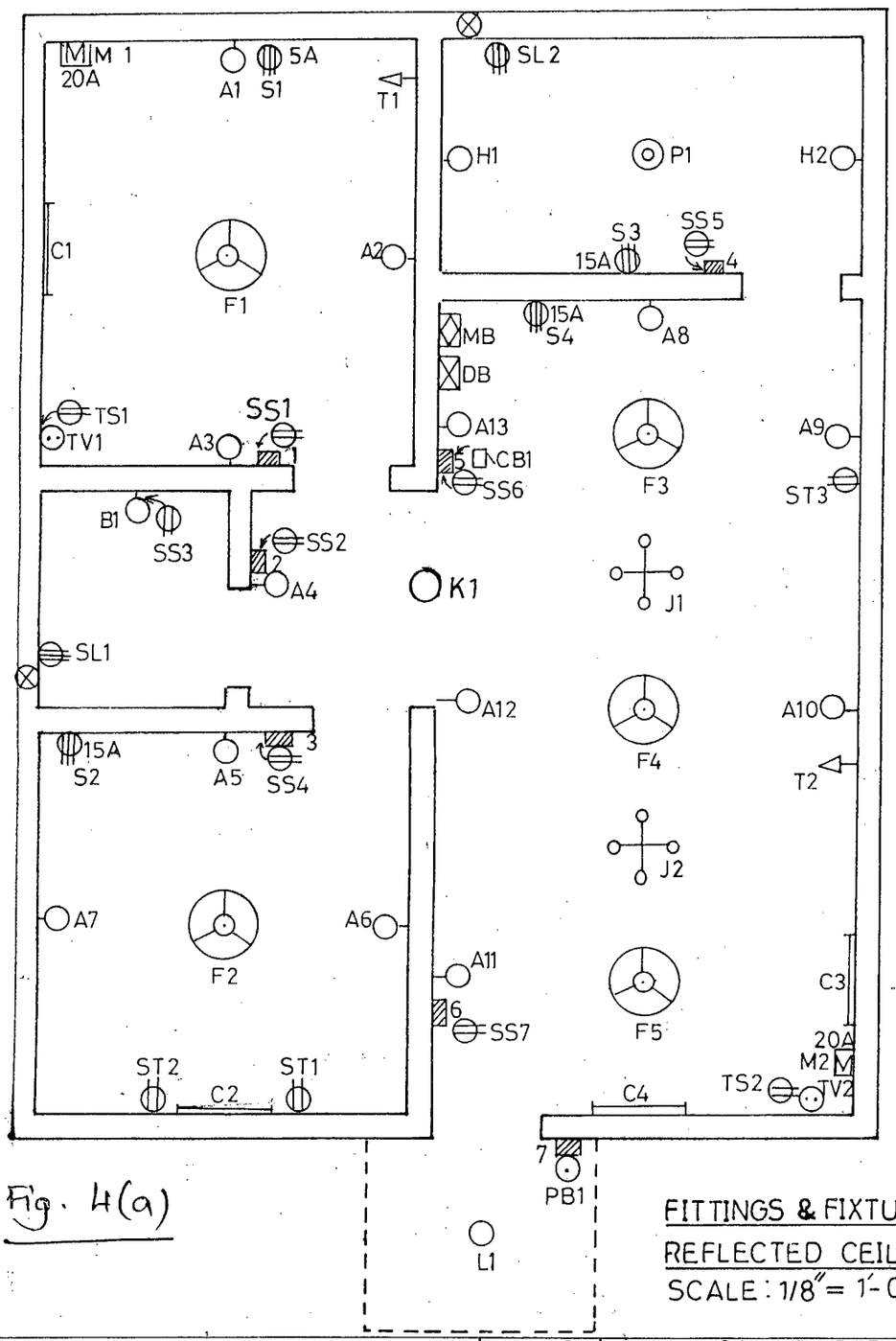

Fig. 4(a)

FITTINGS & FIXTURE LAYOUT
REFLECTED CEILING PLAN
SCALE: 1/8" = 1'-0"

LEGEND

SYMBOL	SHORT DESCRIPTION	SYMBOL	SHORT DESCRIPTION
-○	WALL BRACKET LIGHT AT LINTEL LEVEL	▨	SWITCH BOARD (CONCEALED)
⊖SS	2-PIN 5A SOCKET AT SB LEVEL	M	20A SP MCB AT SKIRTING LEVEL
⊖15	3-PIN 5/15A " " SKIRTING LEVEL	———	FLOURESCENT WALL LIGHT FITTING
⊖ST	2-PIN 5A " " TABLE HT.	⊹	4-POINT CHANDELIER " "
⊖SL	3-PIN 5A " " LINTEL LEVEL	○K	CEILING LIGHT FITTING, TYPE K (SAUCER)
⊖TS	2-PIN 5A " " SKIRTING LEVEL FOR TV	⊠	METER BOARD
⊙	2-PIN TV ANTENNA SOCKET	⊠	DISTRIBUTION BOARD
⊙	PUSH BUTTON	⊗	EXHAUST FAN
◎P	CEILING PENDENT LIGHT	✇	CEILING FAN
⊓	CALLING BELL/BUZZER	—▷	TELEPHONE GROMMET

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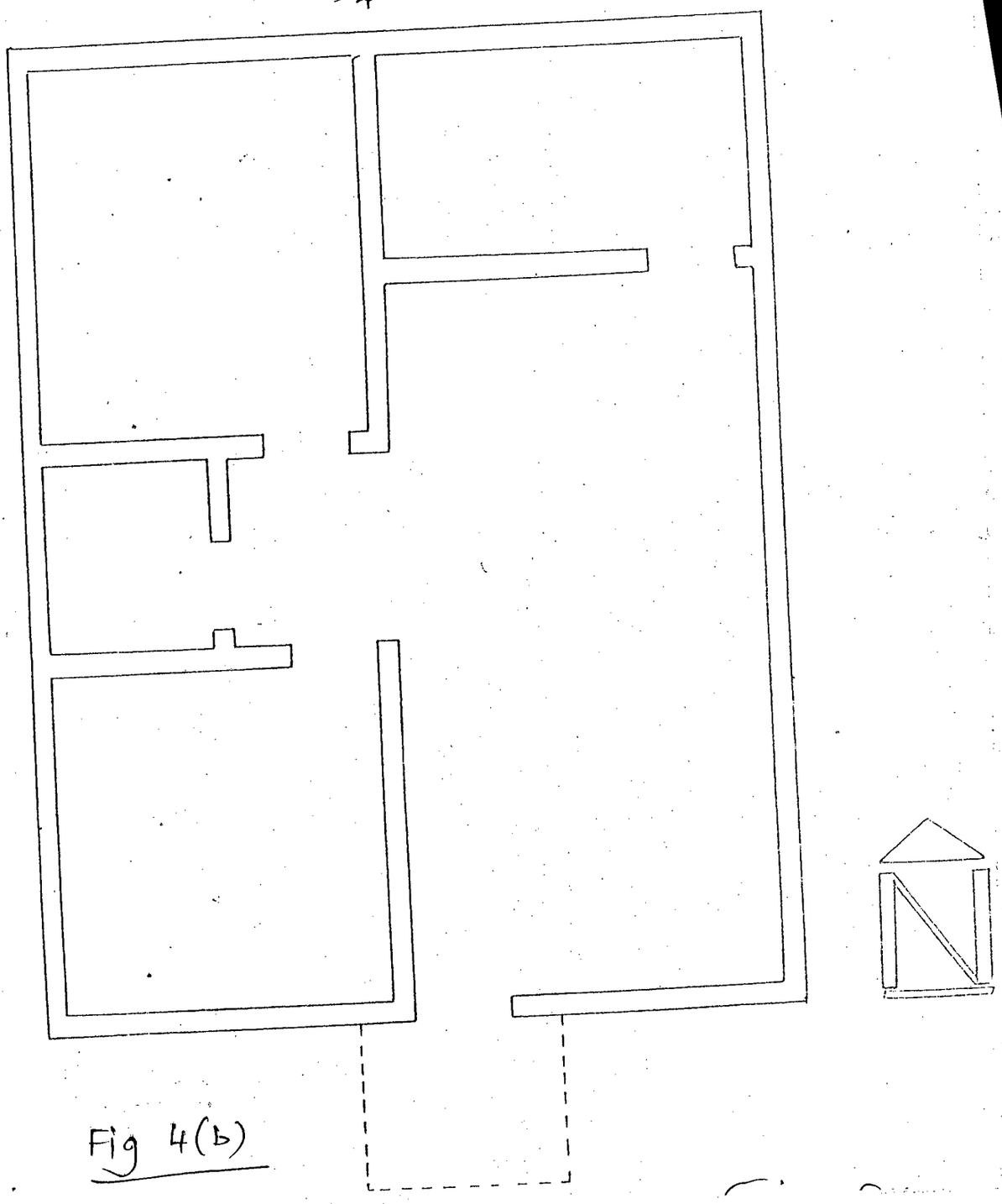

Fig 4(b)

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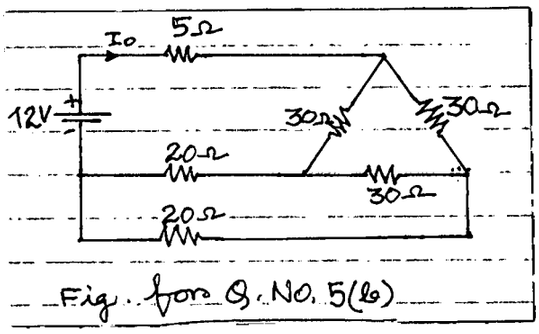

Fig. for Q. NO. 5(b)

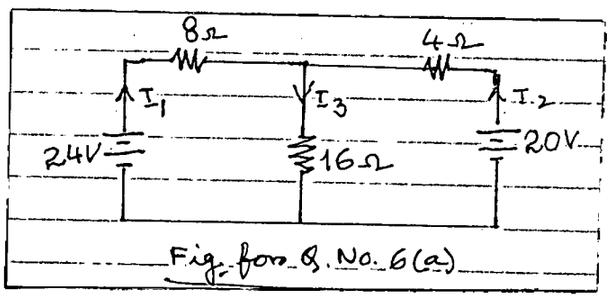

Fig. for Q. No. 6(a)

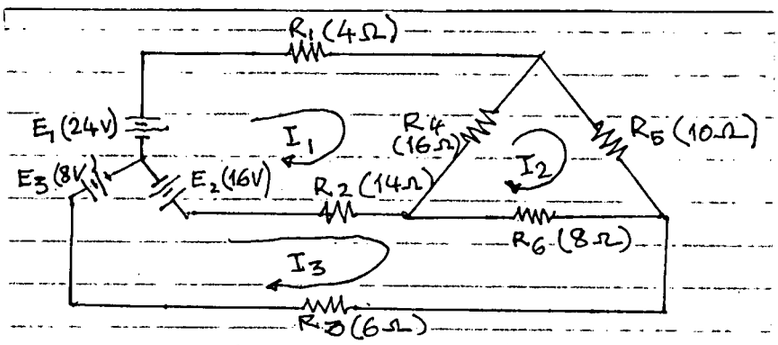

Fig. for Q. No. 6(b)

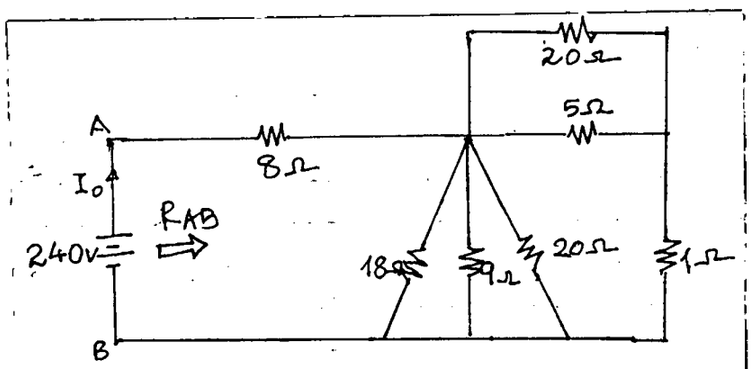

Fig. for Q. No. 7(a)

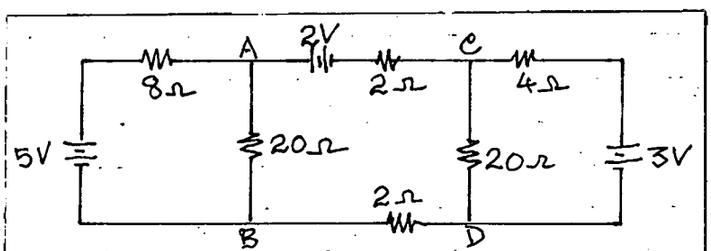

Fig. for Q. NO. 7(b)

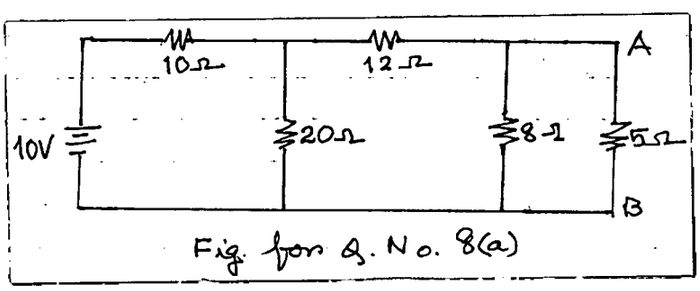

Fig. for Q. No. 8(a)

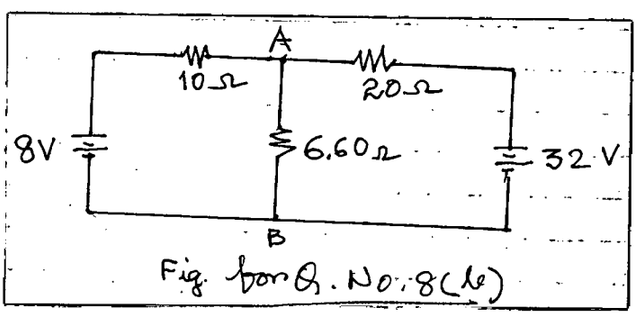

Fig. for Q. NO. 8(b)