

Name

Manzoor Khan

Section

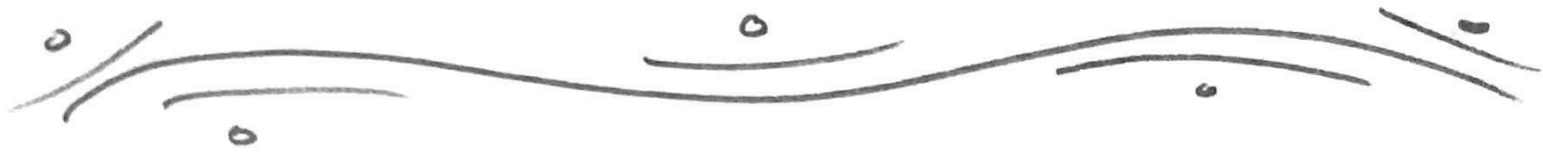
C

ID

7678

Subject

Construction Management



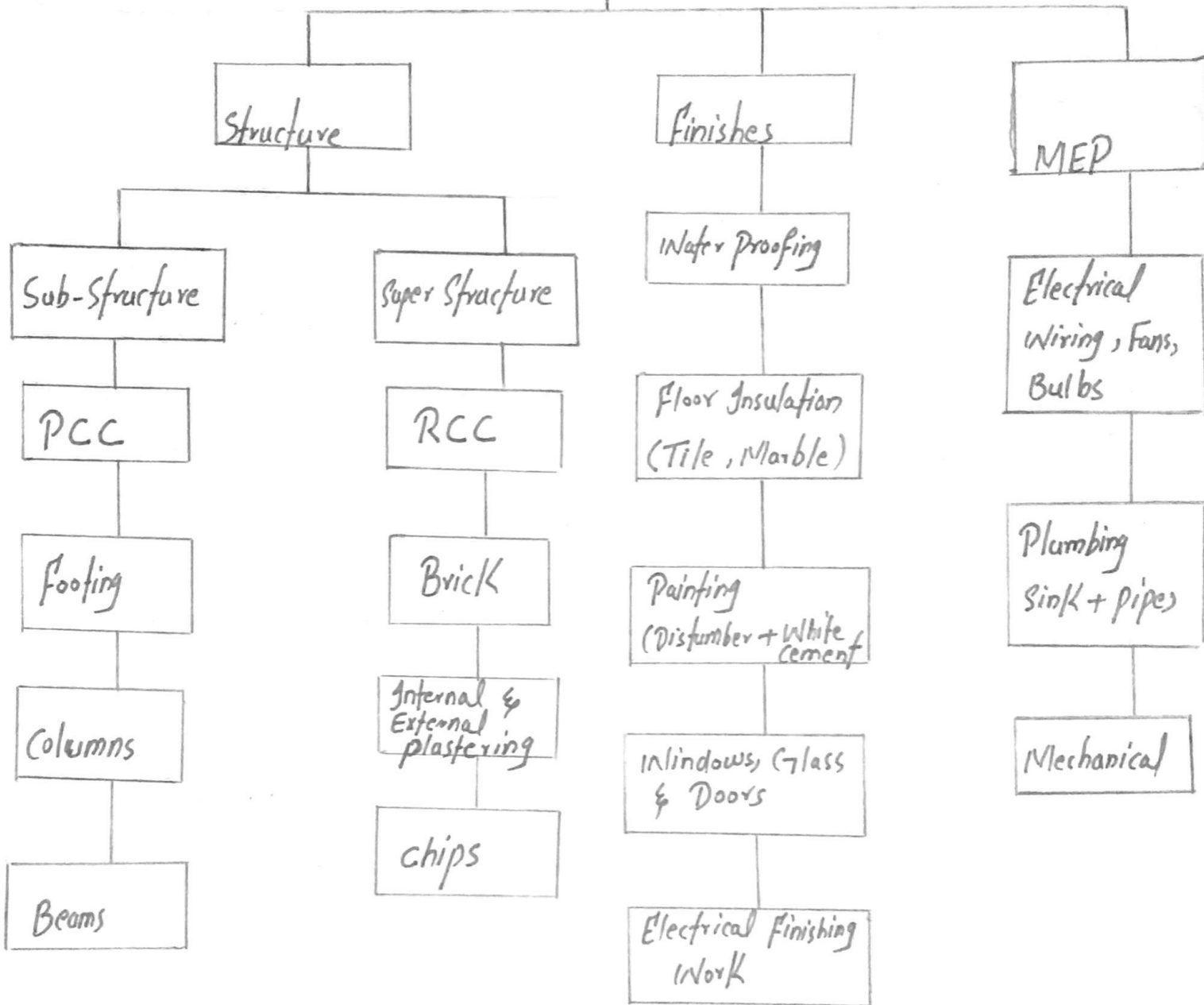
Part (a)

Activity List:

- (1) Excavation , (2) Layout
- (3) Concrete (1:4:8) , (4) pour foundation
- (5) outside plumbing , (6) Fram house
- (7) Electric wiring , (8) Lay Floor
- (9) Lay Roof , (10) Inside plumbing
- (11) Shingling , (12) outside Sheeting
- (13) Windows & Doors , (14) Do Brick work
- (15) Insulate wall & Ceiling , (16) Cover wall & Ceiling
- (17) Insulate Roof , (18) Finish interior
- (19) Finish Exterior , (20) Land Scape.

Part (a)

Work Breakdown Structure Construction of Building



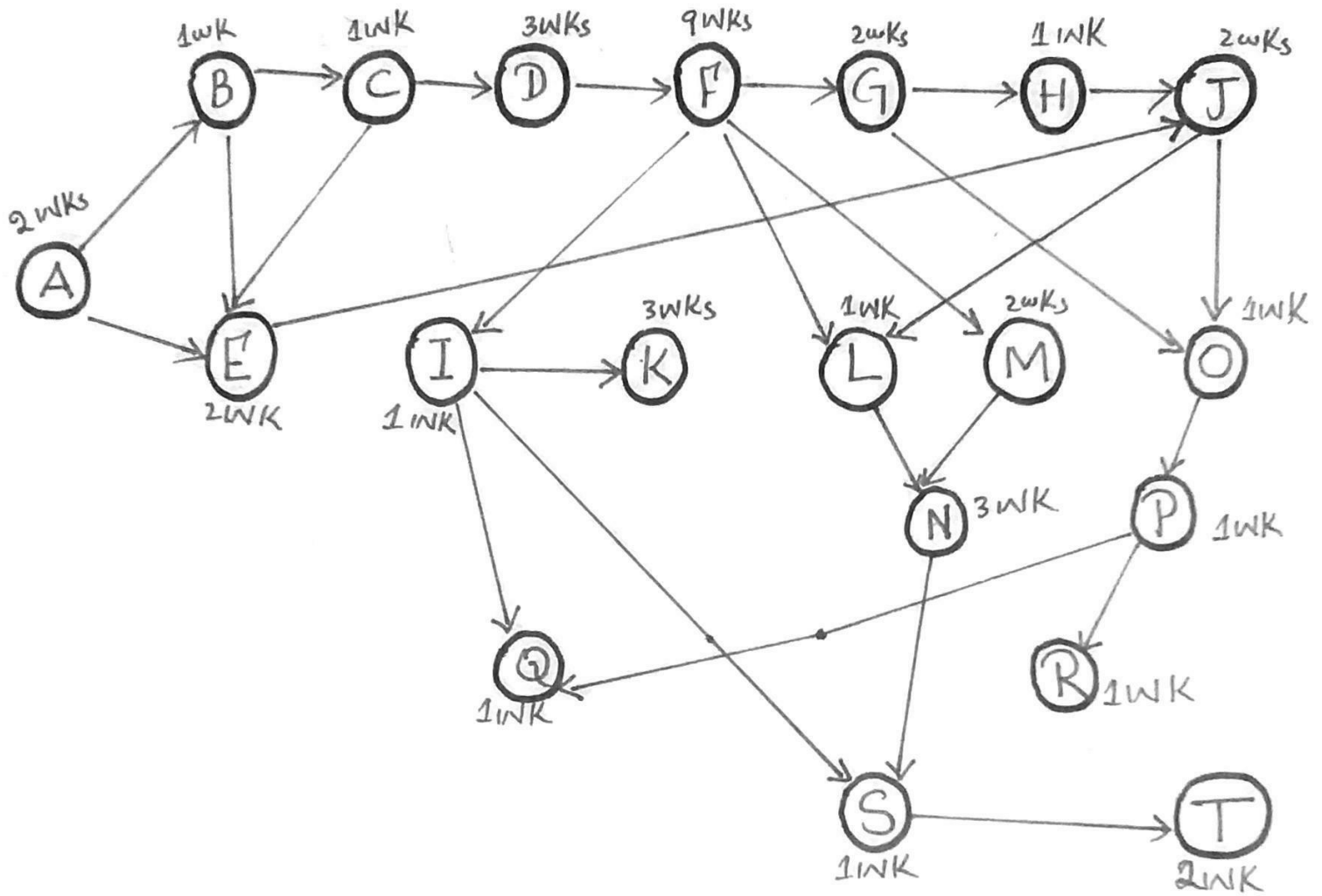
Part C

Answer

CPM Activity List

Name	Activity	Predecessor	Duration (in Ks)
A	Excavation (Basement)	---	02
B	Layout	A	01
C	Concrete 1:4:8	B	01
D	Pour Foundation	C	03
E	outside plumbing	A, B, C	02
F	Frame house	D	09
G	Electric Wiring	F	02
H	Lay Floor	G	01
I	Lay roof	F	01
J	Inside plumbing	E, H	02
K	Shingling	I	03
L	outside Sheeting Insulation	F, J	01
M	Windows & Doors	F	02
N	Brick work	L, M	03
O	Insulate wall & Ceiling	G, J	01
P	Cover Wall & Ceiling	O	01
Q	Insulate Roof	I, P	01
R	Finish Interior	P	01
S	Finish Exterior	I, N	01
T	Landscape	S	02

Precedence Diagram.



⇒ Activity Box;

E.S	S	EF
	Activity	
LS	D	LF

Adding Activity Time

- (1) ABCDFGOPR = $2+1+1+3+9+2+1+1+1 = 21$ weeks ✓
- (2) ABCDFGOPQ = $2+1+1+3+9+2+1+1+1 = 21$ weeks ✓
- (3) ABCDFGHJOPR = $2+1+1+3+9+2+1+2+1+1+1 = 24$ weeks ✓
- (4) ABCDFGHJOPQ = $2+1+1+3+9+2+1+2+1+1+1 = 24$ weeks ✓
- (5) ABCDFMNST = $2+1+1+3+9+2+3+1+2 = 24$ weeks ✓
- (6) ABCDFIK = $2+1+1+3+9+1+3 = 17$ weeks ✗
- (7) ABCDFLNST = $2+1+1+3+9+1+3+1+2 = 22$ weeks ✗
- (8) ABCDFIQ = $2+1+1+3+9+1+1 = 16$ weeks ✗
- (9) ABCEJOPR = $2+1+1+2+2+1+1+1 = 11$ weeks ✗
- (10) ABCEJLNST = $2+1+1+2+2+1+3+1+2 = 15$ weeks ✗
- (11) ABCEJOPQ = $2+1+1+2+2+2+1+1+1 = 13$ weeks ✓
- 12 ABEJOPR = $2+1+2+2+1+1+1 = 10$ weeks ✓
- 13 ABEJOPQ = $2+1+2+2+1+1+1 = 10$ weeks ✓
- 14 AEJOPR = $2+2+2+1+1+1 = 9$ weeks ✗
- 15 AEJOPQ = $2+2+2+1+1+1 = 9$ weeks ✗
- 16 AEJLNST = $2+2+2+1+3+1+2 = 13$ weeks ✓

4

⇒ So here are three longest path So we have decided on slack time. When there are zero slack time and ending The last activity So we take

$$\Rightarrow ABCDFMNST = 24 \text{ weeks}$$

So we check this on CPM.

Calculation formulas

⇒ Forward pass:

$$(1) \text{ Early Finish} = EF = ES + \text{Duration}$$

$$\Rightarrow \boxed{EF = ES + D}$$

lets Activity A:

$$\Rightarrow EF = 0 + 2 = 2$$

Same for other Activities

⇒ As for $E = A, B, C$ So we have a choice to taken greater one.

⇒ for other Activities like J, L, N, O, Q, S we are doing same procedure i.e $E = A, B, C$.

⇒ Backward Pass

Now for Backward pass we are going to start with late finish (L.F).

$$\Rightarrow \text{Formula: } LS = LF - \text{Duration}$$

⇒ when we see our boxes we have Three ending Activities. R, Q, T

⇒ ~~So over~~ So we are going to use 24 for start Backward pass

⇒ Remember 24 wks = project duration.

\Rightarrow lets check for Activity "T".

$$T = 24 - 2 = 22$$

$$\text{For; } S = 22 - 1 = 21$$

for Activity ~~F~~ There are ~~three~~ arrows coming backward

to L, ~~I~~, M

Remember this Backward pass, so our rules have

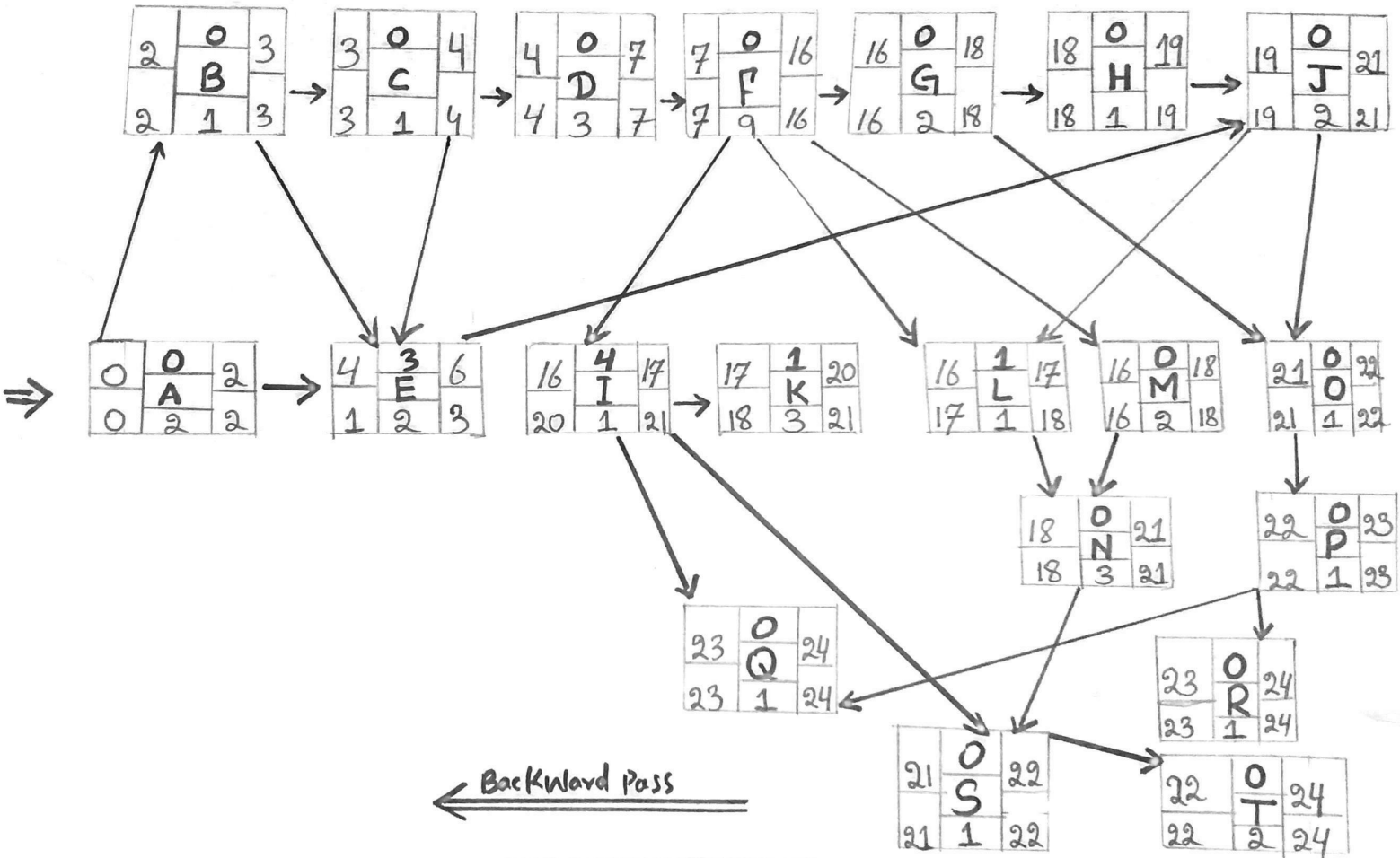
Reversed. So we have choice; so look for Late Start and Lowest one are taken.

So in this case. So we take 16 from M Activity.

Same process for others Activity.

Part C

Forward pass →



After a CPM Method So we clearly seen that ^{critical} Activity path are given "ABCDFMNST" which have longest duration and zero Slack time. Remember this Activity path ^{flow} at end activity.

Part (d):

Answer From the CPM Calculation we know that the Maximum time taken by this project is 24 weeks.

Because the ~~path~~ Critical path gives us 24 Weeks.

☆—————☆—————☆

⇒ Part (e)

Answer:-

Activity	Slack Time	Total
ABCDFIK	0+0+0+0+0+4+1	5wks
ABCDLNST	0+1+0+0+0	1wks
ABCDFIQ	0+0+0+0+0+4+0	4wks
ABCEJOPR	0+0+0+3+0+0+0+0	3wks
ABCEJOPQ	0+0+0+3+0+0+0+0	3wks
ABEJOPR	0+0+3+0+0+0+0	3wks
ABEJOPQ	0+0+3+0+0+0+0	3wks
AEJOPR	0+3+0+0+0+0	3wks
AEJOPQ	0+3+0+0+0+0	3wks
AEJLNST	0+3+0+1+0+0+0	4wks
ABCEJLNST	0+0+0+3+0+1+0+0+0	4wks

Q2) Time line of the building project:

1	Project Name	Project start date	Project Duration	Project End Date
2	Construction of 2 Kanal House	1/05/2020	187 days	4/21/2020
3	Activity	Start date	Duration (days)	End date
4	Planning	01/05/2020	02	03/05/2020
5	Initiation	03/05/2020	02	05/05/2020
6	Site Selection	05/05/2020	02	07/05/2020
7	Architecture	07/05/2020	03	10/05/2020
8	Site Preparation	10/05/2020	05	15/05/2020
⇒	Basement:		32	
(i)	Layout before Excavation	15/05/2020	01	16/05/2020
(ii)	Excavation	16/05/2020	05	21/05/2020
(iii)	Layout After Excavation	21/05/2020	01	22/05/2020
(iv)	Concrete (1:4:8)	22/05/2020	02	24/05/2020
(v)	Installation of Steel	24/05/2020	04	28/05/2020
(vi)	Column Concrete	28/05/2020	02	30/05/2020
(vii)	Plinth	30/05/2020	02	02/06/2020
(viii)	Beam	02/06/2020	03	05/06/2020
ix	Brick work	05/06/2020	06	11/06/2020
x	Formwork Slab	11/06/2020	02	13/06/2020

(xi)	Installation of Steel	13/06/2020	03	16/06/2020
(xii)	Roof Slab Concrete.	16/06/2020	01	17/06/2020
⇒	Ground Floor:-		20	
(i)	Installation of Steel (column)	17/06/2020	04	21/06/2020
(ii)	Column Concrete	21/06/2020	02	23/06/2020
(iii)	Brick work	23/06/2020	05	28/06/2020
(iv)	Beam	28/06/2020	02	30/06/2020
(v)	Formwork slab	30/06/2020	02	01/07/2020
(vi)	Installation of steel	01/07/2020	04	05/07/2020
(vii)	Roof Slab Concrete.	05/07/2020	01	06/07/2020
⇒	1st Floor:-		20	
(i)	Installation of steel (column)	06/07/2020	04	10/07/2020
(ii)	Column Concrete	10/07/2020	02	12/07/2020
(iii)	Brickwork	12/07/2020	05	17/07/2020
(iv)	Beam	17/07/2020	02	19/07/2020
(v)	Formwork slab	19/07/2020	02	21/07/2020
(vi)	Installation of steel	21/07/2020	04	25/07/2020
(vii)	Roof Slab Concrete.	25/07/2020	01	26/07/2020
⇒	Electricity:		20	

(i)	Pipe Fixing in Wall	26/07/2020	07	02/08/2020
(ii)	Wire Fixing in Pipe	02/08/2020	03	05/08/2020
(iii)	Board Fitting	05/08/2020	06	11/08/2020
(iv)	Paint Fitting	11/08/2020	04	15/08/2020
⇒	Plumbing / Sanitary work:		22	
(i)	Pipe Fitting	15/08/2020	12	27/08/2020
(ii)	Sanitary Setting	27/08/2020	10	06/09/2020
⇒	Sewerage system	06/09/2020	15	21/09/2020
⇒	Gas Fitting	21/09/2020	10	01/10/2020
⇒	Finishing:		34	
(i)	Plaster	01/10/2020	20	21/10/2020
(ii)	Paints	21/10/2020	14	04/11/2020
*				*
		<u>End</u>		