**TERM PROJECT**

**Please group with 2 friends. And inform us about your group members (gokhand@yildiz.edu.tr)**

 **(Deadline: final date)**

## PART 1

The data related for **all projects** are as follows:

* A list of activities and their durations are given in Table 1. These activities are minimum required activities valid for all projects (both for dwellings and multi-storey apartments) . For the dwellings, please note that some activities must be carried out in each dwelling (eg. concrete works) and some of them are general activities which are carried out at site area (eg. clean site). The number of activities for each project should be different as number of storeys and floors are different and sequence of work varies with respect to available resources.
* You are required to define relationships between the activities and connect them in a logical sequence to form the final network. You can subdivide the given activities (eg. define activities for each floor or dwelling) or add some new activities you think that are necessary. You have to use your own judgement and consider physical constraints while deciding on the order of the work. You must be able to justify any assumptions you have made in your report. Please also note the following remarks while constructing the network;
1. For dwelling projects; assume that there is only one team responsible for formworks, one team for reinforcement works and one team for concrete works. This means that these works can not be carried out in parallel (laddering is necessary). You do not have such restrictions for the rest of the activities (You can assume parallel or series activities).
2. For multi-storey apartment projects, assume that you have only one team responsible for construction of walls, plastering and painting. This means that these works can not be carried out in parallel (laddering is necessary). You do not have such restrictions for the rest of the activities (You can assume parallel and series activities).
3. On the top of each project data sheet (PART 2), the type of project is defined as DWELLING or APARTMENT indicating which of the following two assumptions given above is valid for your group. If a dwelling has more than 3 floors, it should be treated as an apartment.
* The first thing to do is to prepare an extended activity list in logical order with logical activity codes similar to the one given below.

|  |  |
| --- | --- |
| Activity code | Activity description\* |
| CW 100  | Concrete works in the 1st dwelling  |
| CT 200 | Ceramic tiles in the 2nd floor |
| F 210 | Formworks of the 2nd floor in the 1st dwelling |

 \*Please note that these codes are given as an example, you should create your own code system appropriate for your project.

* For simplicity, only 3 resources are defined in all of the projects: unskilled labour, excavator and timber. You are required to assign these resources to your activities. You are not required to make any calculations to find the amount of resources necessary for each activity but you should try to be logical and consistent. Some activities may be assigned all of the resources while some can be assigned only one resource (eg. unskilled labour). You are not required to define any other resources (like concrete team, concrete, engineer etc.). Please note that, there are no upper limits for unskilled labour and timber but you have only 1 excavator.

**YOU ARE REQUIRED TO DO THE FOLLOWING:**

* Draw an A-o-A network.
* Enter the activity and resource data in Primavera software and construct the

A-o-N network. Calculate the total project duration and indicate critical activities. Prepare necessary sheets showing EST, EFT, LST, LFT and total float of each activity. Also, prepare resource sheets showing the resources allocated to each activity. You are not required to carry out resource levelling operation. Draw resource utilisation graph of any resource (not for all resources but for only one resource).

* **A report should be submitted explaining all procedure and the outputs.**

PLEASE NOTE THAT *DURATIONS* OF ACTIVITIES, *PROJECT START DATES, NUMBER OF WORKING DAYS/WEEK, NON-WORKING DAYS* AND *NUMBER OF WORKING HOURS/DAY* ARE DIFFERENT FOR EACH PROJECT.

# Table 1. Activities

(Note that activities are not given in the logical order)

|  |  |
| --- | --- |
|  | Activity |
| 1 | Clear site |
| 2 | Excavation |
| 3 | Plain concrete |
| 4 | Footings |
| 5 | Formworks |
| 6 | Reinforcement |
| 7 | Concrete works  |
| 8 | Walls |
| 9 | Roofing |
| 10 | Sanitary installations |
| 11 | Installation of window frames |
| 12 | Installation of door frames |
| 13 | Installation of cuboards |
| 14 | Ceramic tiles in wet areas |
| 15 | Plastering |
| 16 | Levelling screed |
| 17 | Carpets |
| 18 | Installation of windows |
| 19 | Installation of doors |
| 20 | Glazing |
| 21 | Painting |
| 22 | Installation of accessories |
| 23 | Landscape |

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 1

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 6 dwellings (1 storey)**

**PROJECT START DATE: 01.05.2018**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Sundays

**NUMBER OF WORKING HOURS/DAY: 9 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 5 |
| 2 | Excavation | 7 |
| 3 | Plain concrete | 3 |
| 4 | Footings | 11 |
| 5 | Formworks | 3\* |
| 6 | Reinforcement | 2\* |
| 7 | Concrete works  | 1\* |
| 8 | Walls | 7\* |
| 9 | Roofing | 15\* |
| 10 | Sanitary installations | 8\* |
| 11 | Installation of window frames | 3\* |
| 12 | Installation of door frames | 3\* |
| 13 | Installation of cuboards | 4\* |
| 14 | Ceramic tiles in wet areas | 4\* |
| 15 | Plastering | 6\* |
| 16 | Levelling screed | 4\* |
| 17 | Carpets | 4\* |
| 18 | Installation of windows | 3\* |
| 19 | Installation of doors | 1\* |
| 20 | Glazing | 4\* |
| 21 | Painting | 6\* |
| 22 | Installation of accessories | 7\* |
| 23 | Landscape | 8 |

\* These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 2

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 2 dwellings (three storeys)**

**PROJECT START DATE: 05.05.2018**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Friday

**NUMBER OF WORKING HOURS/DAY: 10 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 1 |
| 2 | Excavation | 3 |
| 3 | Plain concrete | 2 |
| 4 | Footings | 16 |
| 5 | Formworks | 2\* |
| 6 | Reinforcement | 1\* |
| 7 | Concrete works  | 1\* |
| 8 | Walls | 5\* |
| 9 | Roofing | 20\*\* |
| 10 | Sanitary installations | 5\* |
| 11 | Installation of window frames | 1\* |
| 12 | Installation of door frames | 1\* |
| 13 | Installation of cuboards | 2\* |
| 14 | Ceramic tiles in wet areas | 3\* |
| 15 | Plastering | 6\* |
| 16 | Levelling screed | 4\* |
| 17 | Carpets | 4\* |
| 18 | Installation of windows | 3\* |
| 19 | Installation of doors | 2\* |
| 20 | Glazing | 4\* |
| 21 | Painting | 7\* |
| 22 | Installation of accessories | 5\* |
| 23 | Landscape | 6 |

\* These durations are given for each storey of each dwelling.

**\*\***  These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 3

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 3 dwellings (two storeys)**

**PROJECT START DATE: 10.05.2018**

**NUMBER OF WORKING DAYS/WEEK: 7 days/week**

#### NON-WORKING DAYS: none

**NUMBER OF WORKING HOURS/DAY: 7 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 6 |
| 2 | Excavation | 10 |
| 3 | Plain concrete | 2 |
| 4 | Footings | 20 |
| 5 | Formworks | 3\* |
| 6 | Reinforcement | 3\* |
| 7 | Concrete works  | 2\* |
| 8 | Walls | 5\* |
| 9 | Roofing | 15\*\* |
| 10 | Sanitary installations | 6\* |
| 11 | Installation of window frames | 2\* |
| 12 | Installation of door frames | 2\* |
| 13 | Installation of cuboards | 3\* |
| 14 | Ceramic tiles in wet areas | 3\* |
| 15 | Plastering | 7\* |
| 16 | Levelling screed | 5\* |
| 17 | Carpets | 3\* |
| 18 | Installation of windows | 6\* |
| 19 | Installation of doors | 2\* |
| 20 | Glazing | 3\* |
| 21 | Painting | 10\* |
| 22 | Installation of accessories | 6\* |
| 23 | Landscape | 6 |

\* These durations are given for per storey per dwelling.

**\*\***  These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 4

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 4 dwellings (two storeys)**

**PROJECT START DATE: 15.05.2018**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Sundays

**NUMBER OF WORKING HOURS/DAY: 12 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 5 |
| 2 | Excavation | 10 |
| 3 | Plain concrete | 4 |
| 4 | Footings | 11 |
| 5 | Formworks | 4\* |
| 6 | Reinforcement | 2\* |
| 7 | Concrete works  | 1\* |
| 8 | Walls | 5\* |
| 9 | Roofing | 12\*\* |
| 10 | Sanitary installations | 7\* |
| 11 | Installation of window frames | 2\* |
| 12 | Installation of door frames | 3\* |
| 13 | Installation of cuboards | 2\* |
| 14 | Ceramic tiles in wet areas | 4\* |
| 15 | Plastering | 9\* |
| 16 | Levelling screed | 5\* |
| 17 | Carpets | 3\* |
| 18 | Installation of windows | 1\* |
| 19 | Installation of doors | 1\* |
| 20 | Glazing | 3\* |
| 21 | Painting | 13\* |
| 22 | Installation of accessories | 6\* |
| 23 | Landscape | 5 |

\* These durations are given for per storey per dwelling.

**\*\***  These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 5

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 3 dwellings (three storeys)**

**PROJECT START DATE: 20.05.2018**

**NUMBER OF WORKING DAYS/WEEK: 7 days/week**

#### NON-WORKING DAYS: none

**NUMBER OF WORKING HOURS/DAY: 11 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 3 |
| 2 | Excavation | 7 |
| 3 | Plain concrete | 10 |
| 4 | Footings | 14 |
| 5 | Formworks | 3\* |
| 6 | Reinforcement | 2\* |
| 7 | Concrete works  | 3\* |
| 8 | Walls | 9\* |
| 9 | Roofing | 15\*\* |
| 10 | Sanitary installations | 10 |
| 11 | Installation of window frames | 3\* |
| 12 | Installation of door frames | 3\* |
| 13 | Installation of cuboards | 3\* |
| 14 | Ceramic tiles in wet areas | 4\* |
| 15 | Plastering | 10\* |
| 16 | Levelling screed | 5\* |
| 17 | Carpets | 4\* |
| 18 | Installation of windows | 1\* |
| 19 | Installation of doors | 2\* |
| 20 | Glazing | 3\* |
| 21 | Painting | 10\* |
| 22 | Installation of accessories | 12\* |
| 23 | Landscape | 9 |

\* These durations are given for each storey of each dwelling.

**\*\***  These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 6

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 9 dwellings (1 storey)**

**PROJECT START DATE: 25.05.2018**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Sundays

**NUMBER OF WORKING HOURS/DAY: 12 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 3 |
| 2 | Excavation | 5 |
| 3 | Plain concrete | 5 |
| 4 | Footings | 20 |
| 5 | Formworks | 2\* |
| 6 | Reinforcement | 1\* |
| 7 | Concrete works  | 2\* |
| 8 | Walls | 8\* |
| 9 | Roofing | 25 |
| 10 | Sanitary installations | 7 |
| 11 | Installation of window frames | 2\* |
| 12 | Installation of door frames | 1\* |
| 13 | Installation of cuboards | 2\* |
| 14 | Ceramic tiles in wet areas | 5\* |
| 15 | Plastering | 5\* |
| 16 | Levelling screed | 4\* |
| 17 | Carpets | 2\* |
| 18 | Installation of windows | 1\* |
| 19 | Installation of doors | 2\* |
| 20 | Glazing | 3\* |
| 21 | Painting | 5\* |
| 22 | Installation of accessories | 9\* |
| 23 | Landscape | 4 |

\* These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 7

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of an apartment (9 storey)**

**PROJECT START DATE: 01.06.2018**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Sundays

**NUMBER OF WORKING HOURS/DAY: 12 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 2 |
| 2 | Excavation | 10 |
| 3 | Plain concrete | 3 |
| 4 | Footings | 8 |
| 5 | Formworks | 3\* |
| 6 | Reinforcement | 2\* |
| 7 | Concrete works  | 2\* |
| 8 | Walls | 5\* |
| 9 | Roofing | 15\* |
| 10 | Sanitary installations | 5\* |
| 11 | Installation of window frames | 2\* |
| 12 | Installation of door frames | 2\* |
| 13 | Installation of cuboards | 3\* |
| 14 | Ceramic tiles in wet areas | 9\* |
| 15 | Plastering | 6\* |
| 16 | Levelling screed | 4\* |
| 17 | Carpets | 3\* |
| 18 | Installation of windows | 3\* |
| 19 | Installation of doors | 2\* |
| 20 | Glazing | 4\* |
| 21 | Painting | 4\* |
| 22 | Installation of accessories | 5\* |
| 23 | Landscape | 3 |

\* These durations are given for each storey.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 8

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of an apartment (10 storey)**

**PROJECT START DATE: 10.06.2018**

**NUMBER OF WORKING DAYS/WEEK: 7 days/week**

#### NON-WORKING DAYS: None

**NUMBER OF WORKING HOURS/DAY: 10 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 10 |
| 2 | Excavation | 15 |
| 3 | Plain concrete | 3 |
| 4 | Footings | 20 |
| 5 | Formworks | 2\* |
| 6 | Reinforcement | 1\* |
| 7 | Concrete works  | 2\* |
| 8 | Walls | 6\* |
| 9 | Roofing | 15\* |
| 10 | Sanitary installations | 11\* |
| 11 | Installation of window frames | 2\* |
| 12 | Installation of door frames | 1\* |
| 13 | Installation of cuboards | 3\* |
| 14 | Ceramic tiles in wet areas | 6\* |
| 15 | Plastering | 5\* |
| 16 | Levelling screed | 3\* |
| 17 | Carpets | 4\* |
| 18 | Installation of windows | 2\* |
| 19 | Installation of doors | 2\* |
| 20 | Glazing | 5\* |
| 21 | Painting | 8\* |
| 22 | Installation of accessories | 10\* |
| 23 | Landscape | 7 |

\* These durations are given for each storey.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 9

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of an apartment (10 storeys)**

**PROJECT START DATE: 16.06.2018**

**NUMBER OF WORKING DAYS/WEEK: 5 days/week**

#### NON-WORKING DAYS: Saturdays and Sundays

**NUMBER OF WORKING HOURS/DAY: 9 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 4 |
| 2 | Excavation | 8 |
| 3 | Plain concrete | 4 |
| 4 | Footings | 13 |
| 5 | Formworks | 2\* |
| 6 | Reinforcement | 2\* |
| 7 | Concrete works  | 1\* |
| 8 | Walls | 5\* |
| 9 | Roofing | 18 |
| 10 | Sanitary installations | 6 |
| 11 | Installation of window frames | 1\* |
| 12 | Installation of door frames | 3\* |
| 13 | Installation of cuboards | 5\* |
| 14 | Ceramic tiles in wet areas | 5\* |
| 15 | Plastering | 8\* |
| 16 | Levelling screed | 5\* |
| 17 | Carpets | 4\* |
| 18 | Installation of windows | 2\* |
| 19 | Installation of doors | 5\* |
| 20 | Glazing | 4\* |
| 21 | Painting | 5\* |
| 22 | Installation of accessories | 8\* |
| 23 | Landscape | 30 |

\*These durations are given for each storey.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 10

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 4 dwellings (3 storeys)**

**PROJECT START DATE: 19.06.2018**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Sundays

**NUMBER OF WORKING HOURS/DAY: 9 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 12 |
| 2 | Excavation | 20 |
| 3 | Plain concrete | 5 |
| 4 | Footings | 30 |
| 5 | Formworks | 2\* |
| 6 | Reinforcement | 3\* |
| 7 | Concrete works  | 2\* |
| 8 | Walls | 6\* |
| 9 | Roofing | 12\*\* |
| 10 | Sanitary installations | 8 |
| 11 | Installation of window frames | 2\* |
| 12 | Installation of door frames | 2\* |
| 13 | Installation of cuboards | 4\* |
| 14 | Ceramic tiles in wet areas | 5\* |
| 15 | Plastering | 6\* |
| 16 | Levelling screed | 2\* |
| 17 | Carpets | 3\* |
| 18 | Installation of windows | 3\* |
| 19 | Installation of doors | 4\* |
| 20 | Glazing | 7\* |
| 21 | Painting | 13\* |
| 22 | Installation of accessories | 15\* |
| 23 | Landscape | 35 |

\* These durations are given for each storey.

**\*\***  These durations are given for each dwelling.

**FINAL PROJECT**

**PART 2**

## PROJECT DATA FOR GROUP NO: 11

YOU SHOULD FORM GROUPS OF 4 STUDENTS FROM WHICH **A SINGLE REPORT** SHOULD BE SUBMITTED. YOU SHOULD ALSO SUBMIT YOUR OUTPUTS WITH CD.

**PROJECT TYPE: Construction of 6 dwellings (2 storeys)**

**PROJECT START DATE: 21.01.2019**

**NUMBER OF WORKING DAYS/WEEK: 6 days/week**

#### NON-WORKING DAYS: Sundays

**NUMBER OF WORKING HOURS/DAY: 12 hours/day**

|  |  |  |
| --- | --- | --- |
|  | Activity | Duration (days) |
| 1 | Clear site | 30 |
| 2 | Excavation | 12 |
| 3 | Plain concrete | 8 |
| 4 | Footings | 25 |
| 5 | Formworks | 3\* |
| 6 | Reinforcement | 5\* |
| 7 | Concrete works  | 4\* |
| 8 | Walls | 4\* |
| 9 | Roofing | 19\*\* |
| 10 | Sanitary installations | 10 |
| 11 | Installation of window frames | 3\* |
| 12 | Installation of door frames | 3\* |
| 13 | Installation of cuboards | 3\* |
| 14 | Ceramic tiles in wet areas | 3\* |
| 15 | Plastering | 8\* |
| 16 | Levelling screed | 6\* |
| 17 | Carpets | 2\* |
| 18 | Installation of windows | 2\* |
| 19 | Installation of doors | 1\* |
| 20 | Glazing | 4\* |
| 21 | Painting | 11\* |
| 22 | Installation of accessories | 7\* |
| 23 | Landscape | 50 |

\* These durations are given for each storey.

**\*\***  These durations are given for each dwelling.

GROUPS

GROUP NO:1 Elif ve Bledonna

GROUP NO:2 Abdulrahim Aydin, Bedri Bulut, Fatih Yildirim

GROUP NO:3 Recep Kabakçı, Gürcan Yağcı

GROUP NO:4 Köksal koç, Engin Arın

GROUP NO:5 Emre Levent, Muhammet Sıraç Budak

GROUP NO:6 Abdullah Sarı ve Yunus Meral

GROUP NO:7

GROUP NO:8

GROUP NO:9

GROUP NO:10

GROUP NO:11