LAB ASSIGNMENT- 2021

Subject: Software Engineering Lab   Discipline:

Subject Code: Semester:

ASSIGNMENT-1 (Project Scheduling: Activity Network & Gantt Chart)

(A) Consider the following activities of a project:

a) Specification	(15days)
b) Design database	(45 days)
c) Design GUI part	(30 days)
d) Write user manual	(60 days)
e) Code database part	(105 days)
f) Code GUI part	(45 days)
g) Integrate and test	(120 days)

The following precedence relations hold among the tasks:

     a<{b,c,d}; {b<e}; c<f; {e,f}<g.

Draw the Activity Network Diagram .Find out the following time parameter for each job: ES, LS, EF, LF, ST & MT for the project

Draw the Gantt chart.

(B) An annual general meeting of a large company will be held on 25th August, 2014.

List of activities:

     a) Book the meeting space.
     b) Schedule speakers.
     c) Arrange for audio-visual equipments.
     d) Order food.
     e) Send out invitation
     f) Mail out annual report.

Details task analysis under order food:

     d.1) Create a budget.
     d.2) Determine a menu.
     d.3) Select a caterer.
         d.3.1) Send out request for bids.
         d.3.2) Receive all estimates.
         d.3.3) Review estimates and award contract.
     d.4) Give final head count to caterer.
     d.5) Confirm menu one week before the meeting.

Draw the Gantt chart and determine the finish date.

(C) Construct a work break down structure to organize a picnic.

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(D) Consider the following tasks:

Task name	Duration	Dependency
T_1	5	Independent
T_2	7	Independent
T_3	3	T_1(FS)
T_4	7	T_3(SS)
T_5	10	T_2(FS)
T_6	4	Independent
T_7	4	T_6(FF)

a) Create 3 subtasks of T_2.
b) Create 4 subtasks of T_4.
c) Create 2 subtasks of T_5.
d) Insert one weekly recurring task with 4 occurrences before T_3 on Wednesday.
e) Show the critical path and determine the finish date.

(E) Enter the following tasks:

Tasks	Start Date	Durations (Days)	Resources	Dependency
T_1	<Today>	1	R_1,R_2	Ind.
T_2	<Today>	2	R_2,R_4	Ind.
T_3	<Today> + 5	3	R_6,R_7	T_1(FS)
T_4	<Today> + 7	4	R_9,R_{10}	Ind.
T_5	<Today> + 10	10	R_1,R_5	Ind.
T_6	<Today> + 10	10	R_6, R_8	T_4(SS)
T_7	<Today> + 10	2	R_3	T_4(FF)
T_8	<Today> + 14	5	R_8,R_9	Ind.

Do the following:

i) Enter a Task (NEW1) before the first task (T_1).

ii) Enter a Task (NEW2) just before the last Task (T_8).

iii) Create 2 sequential subtasks for the task T_2.

iv) Move the 2nd Independent task (T_2) just before the last task.

v) Create 4 sequential subtasks under the 4th Independent Task (T_5).

vi) Move the 5th Independent Task at the Top.

vii) Increase the Resource (one) for 3rd Independent Task and observe its change in duration.

viii) Decrease the Resources (one) of 1st Independent Tasks and observe the change in the duration of the tasks accordingly.

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(F) Consider the following tasks and resource information:

Tasks	Durations (Days)	Resources	Standard Rate	Dependency
T_1	3	R_1, R_2		Ind.
T_2	5	R_3, R_4	R_1:\$10/Hr	Ind.
T_3	3	R_2, R_5	R_2:\$12/Hr	T_1(FS)
T_4	4	R_4, R_6	R_3:\$10/Hr	T_2(FS), T_3(SS)
T_5	10	R_1, R_3	R_4:\$15/Hr	T_4(FS)
T_6	12	R_2	R_5:\$15/Hr	T_3(FS)
T_7	4	R_4	R_6:\$20/Hr	T_5(FF)
T_8	5	R_5, R_6		T_6FS), T_7(FS)

Calculate the usage of the resources (in hours) with assigned tasks and determine manufacturing cost of the project and market price to achieve 25% profit.

ASSIGNMENT-2(Project Scheduling- PERT Chart)

(A) Do the following:

i) Enter 5 tasks with duration 120 days, 90 days, 75 days, 105 days, 60 days.

ii) Enter a Recurring Tasks after Task 1. Name of the recurring tasks "Review of weekly progress", Occurrence - weekly, Recurrence Frequency - Tuesday, Range of recurrence - From Start Date to 90 days after the Start Date.

iii) Change the constraints of Task 3 - Finish No Earlier Than.

iv) Change the constraints of Task 4 - Must start on - 50 days after the start of the project.

v) Set the Deadline date for Task 5 as 100 days after the start of the project.

vi) Manipulate the Gantt chart to view Timing.

(B) Consider the following activities with optimistic, nominal & pessimistic duration to organize a conference:

      a) Conference

           a.1) Preplanning

                a.1.1) Determine topics   (3, 5, 7)

                a.1.2) Send invitation   (2, 3, 5)

           a.2) Selection

                a.2.1) Receive papers   (1, 2, 3)

                a.2.2) Review and select papers   (5, 8, 10)

                a.2.3) Prepare schedule   (2, 3, 5)

Precedence relations: a.1<a.2; a.1.1<a.1.2; a.2.1<a.2.2<a.2.3

Determine the duration of the summary tasks.

Draw the optimistic, expected and pessimistic Gantt chart for the project.

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ASSIGNMENT-3 (Use case Diagram)

(A) Draw the use case diagram of an online shopping system which allows customers to view products without registering. Customers can make purchases after login into the system. To buy a product customer selects products and add to the cart. Any time customer can update his cart before finalize it. Customers are able to make payments from credit card or cash on delivery. Product descriptions must be maintained and updated by administrator.

(B) Draw the use case diagram of Website management. Website Administrator actor could manage user groups, users, user sessions, and logs. Help Desk staff uses a subset of functions available to the Website Administrator.

ASSIGNMENT-4 (Class Diagram)

(A) Online ticket reservation system for railway department has to be developed.
The System developed should contain following features
1. The System should provided information about arrival and departure trains along with information about stations through which it passes.
2. Search about train passing through stations can be obtained either by means of train no, train name or specifying the source and destination stations.
3. While displaying information about train it has provide following information's
     a) Stations through which train passes along with arrival and departure   time.
     b) Availability of seats in different classes along with waiting list.
4. While reserving ticket online the system obtain following information's from the user
     a) Passenger name, Sex, Age, Address
     b) Credit Card No, Bank Name
     c) Class through passenger is going to travel i.e First or Second class or AC
     d) Train no, Train name, Date of Journey and number of tickets to be booked.
5. Based on the availability of tickets the ticket has to be issued. The ticked issued should contain the following information's PNR NO, Train No, Date, K.M., no of adults and children, Ticket No, Class, Ticket No, Coach, Seat/Berth, Sex, Age, Reservation fee, Total Cash, Train Name, Departure time.
6. Cancellation of booked tickets should be available.

(B) Student marks analyzing system has to be developed for analyzing obtained by the students who scored in Semester Examination. The System should provide following functionalities
1. The System obtains following information's from the faculty generates report Roll No, Name, Department, Semester, Marks obtained in each subject.
2. The total for each student should be calculated and ranked based on total.

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3. The Final report should display rank, percentage, Class, Pass/Fail status for each student.

ASSIGNMENT-5 (Sequence Diagram)

(A) Consider an ATM System for ICICI Bank. The System should contain the following features:

1. The Customer login into the system using Credit Card No. or Debit Card No. and Pin Number. The system checks for validation.

2. The System queries the customer for the type of account either S.B Account or Current. After getting the type of account the system shows the amount left.

3. The System then queries the customer for required amount. The user enters the amount and gets the money if there are sufficient amount in the account.

(B) Draw a sequence diagram of a credit card processing system. The merchant submits a credit card transaction request to the credit card payment gateway on behalf of a customer. Bank which issued customer's credit card could approve or reject the transaction. If transaction is approved, funds will be transferred to merchant's bank account.

ASSIGNMENT-6 (Activity Diagram)

(A) Consider the admission system in a college where a student get admission by depositing admission fees at account section, at the same time he is registered in hostel, academic section and library system of the college. After completion of these procedures he gets the identity card and the library card. Draw the corresponding activity diagram.

(B) Prepare an activity diagram that elaborates the details of logging into an email system.

ASSIGNMENT-7 (System Modeling- ER Diagram)

(A) Draw the ER diagram of a library management system where a member can borrow books of different publishers and authors. Librarian should maintain and update the book and member record.

(B) Draw the ER diagram of a Hospital Management system which includes registration of patients, storing their details into the system, and also computerized billing in the pharmacy, and labs. System has the facility to give a unique id for every patient and stores the details of every patient. It includes a search facility to

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know the current status of each room. User can search availability of a doctor and the details of a patient using the id. The Hospital Management System can be entered using a username and password. It is accessible either by administrator or receptionist. Only they can update the database.

ASSIGNMENT-8 (System Modeling- DFD)

(A) Construct the DFD representation for the following program:

```
main( ) {              f(int a, int b)      f1( )
int a[100];            {                    {
for                    if(a>b) f1( );       return;
(i=0;i<100;i++)        else f2( );          }
f(a[i],a[i+1]);        }
}                                           f2( )
                                            {
                                            return;
                                            }
```

ASSIGNMENT-9 (Preparation of SRS Document)

Prepare the Software Requirement Specification (SRS) for the different projects.

ASSIGNMENT-10(Test Plan)

(A) Design a Test plan (Black Box Testing and White Box Testing) for the program to calculate GCD of two integer numbers.

(B) Consider a program to determine whether a number is 'odd' or 'even' and print the message.

> **NUMBER IS EVEN**
> **Or**
> **NUMBER IS ODD**

The number may be any valid integer. Design a Test plan (Black Box Testing and White Box Testing) for the program.

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Signature of the teacher