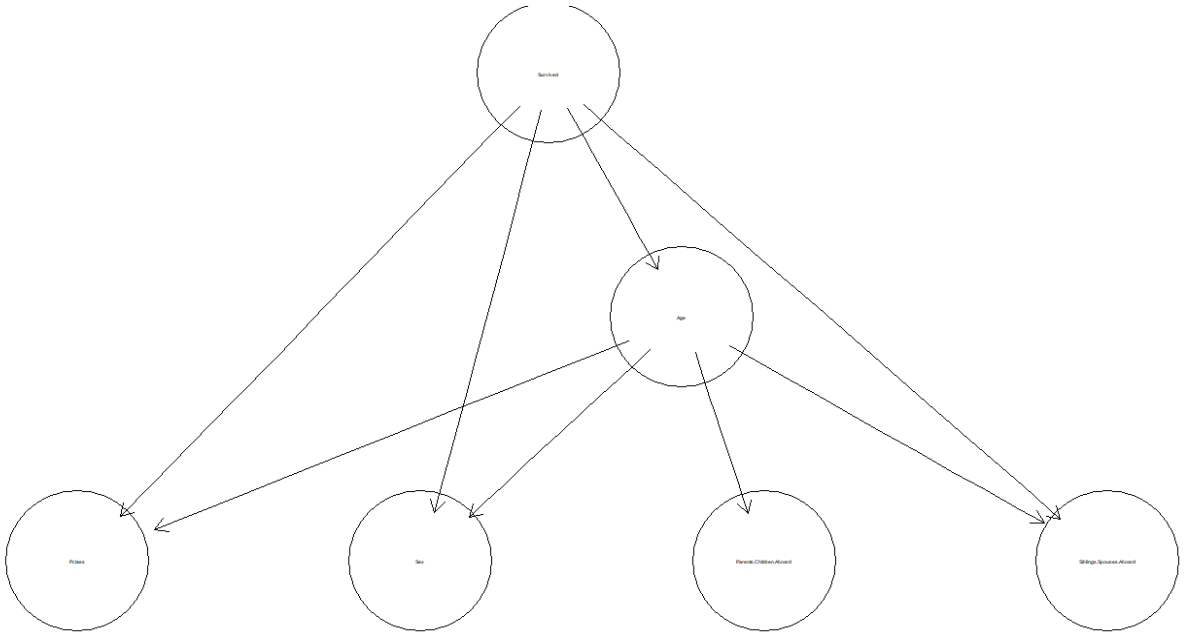
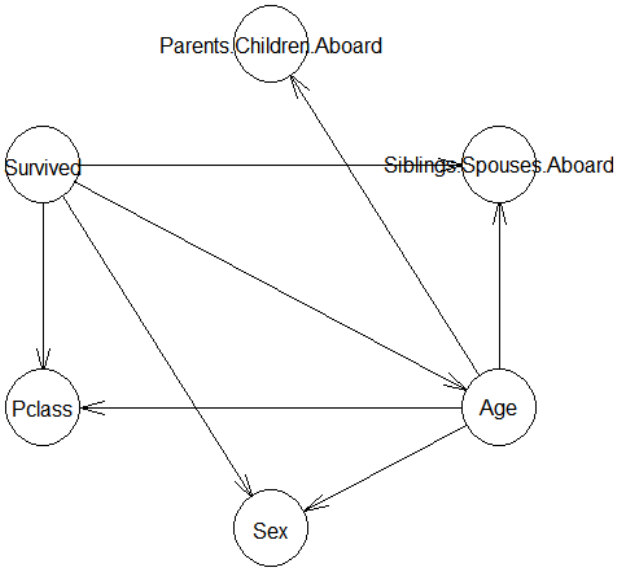
Question 1)

Bayesian network for titanic is created is as shown:





```
> cpquery(fitbn, (Survived == 1), (Sex == 'female'))
[1] 0.7341484
> cpquery(fitbn, (Survived == 1), (Sex == 'female'))
[1] 0.75
> cpquery(fitbn, (Survived == 1), (Age =='Children'))
[1] 0.5341615
> cpquery(fitbn, (Survived == 1), (Age =='Adult'))
[1] 0.3600848
> cpquery(fitbn, (Survived == 1), (Sex == 'female' & Pclass == 1))
[1] 0.9169355
> cpquery(fitbn, (Survived == 1), (Sex == 'female' & Pclass == 3))
[1] 0.5836963
> cpquery(fitbn, (Survived == 1), (Age == 'Children'  & Pclass == 3))
[1] 0.3945409
> cpquery(fitbn, (Survived == 1), (Pclass == 3))
[1] 0.2523483
> cpquery(fitbn, (Survived == 1), (Pclass == 1))
[1] 0.6498969
> cpquery(fitbn, (Survived == 1), (Age == 'Children'  & Sex=='female' & Pclass == 1))
[1] 0.8717949
> cpquery(fitbn, (Survived == 1), (Sex == 'female' & Age == 'Children'))
[1] 0.5590164
```

We see that

- probability of survival of female and 1st class passenger is 0.916,
- probability of survival of 1st class passenger is 0.6498
- probability of survival of 3rd class passenger is 0.252
- probability of survival of female and children in 3rd class is 0.583 and 0.394 respectively

Therefore we can conclude that 1st class passengers were given preference while evacuating , Also females and children were also given preference while evacuating.

Probability of Jack Not surviving

```
> cpquery(fitbn, (Survived == 0), (Sex == 'male' & Pclass==3 & Age=='Adult'))
[1] 0.9120159
```

Probability of Rose surviving

```
> cpquery(fitbn, (Survived == 1), (Sex == 'female' & Pclass==1 & Age=='Adult'))
[1] 0.9214347
>
```

- Probability of 3rd class adult male not surviving is 0.912 which is high. Probability of 1st class female Adult Surviving is 0.921 which is high.
- Therefore we can conclude that probability of Rose (1st class adult and female) and Jack(3rd class adult and male) not surviving is high which is same as that of the movie Titanic.