

## BAB 6

### KESIMPULAN DAN SARAN

#### 6.1. Kesimpulan

Hasil analisis menggunakan ANOVA satu arah menunjukkan bahwa *makespan* pada tiap ukuran *lot* berbeda secara signifikan. Dari hasil penjadwalan, didapatkan ukuran *lot* yang menghasilkan *makespan* minimum berkisar antara *lot* 20, 10, dan 5. Ukuran *lot* yang terlalu kecil dapat menyebabkan *makespan* yang panjang.

Berdasarkan analisis menggunakan ANOVA satu arah, didapatkan bahwa variasi bentuk *bill of material* terhadap ukuran *lot* optimum dan jumlah item penyusun tiap *bill of material* terhadap ukuran *lot* optimum tidak berbeda secara signifikan. Sehingga dapat disimpulkan tidak ada perbedaan yang signifikan antara kompleksitas struktur produk dalam kaitannya dengan ukuran *lot* optimum.

#### 6.2. Saran

Saran yang dapat diberikan untuk penelitian selanjutnya adalah:

1. Melakukan studi kasus dengan menerapkan *range* ukuran *lot* optimum yang didapat dari penelitian-penelitian yang telah dilakukan sesuai dengan peta penelitian Laboratorium Sistem Produksi Universitas Atma Jaya Yogyakarta.
2. Mengevaluasi pengaruh kompleksitas *routing file* (jumlah mesin, jumlah operasi, waktu *setup* dan waktu *run*) terhadap ukuran *lot* optimum.

## DAFTAR PUSTAKA

*APICS Dictionary*, 2002, Tenth Edition, Terry College of Business University of Georgia.

Ariyono, V., Suharyanti, Y., 2008, *The Effect of Product Structure Complexity and Setup Time-Run Time Ratio (R) on Makespan in Multilevel Product Scheduling*, Industrial Engineering Departement, Universitas Atma Jaya Yogyakarta.

Arnold, J.R.T., Chapman, S.N., 2001, *Introduction to Materials Management*, Fourth Edition, Prentice Hall, New Jersey.

Askin, R.G., Standridge, C.R., 1993, *Modeling and Analysis of Manufacturing Systems*, John Wiley & Sons, Inc., New York.

Baker, K.R., 1974, *Introduction to Sequencing and Scheduling*, John Wiley & Sons, Inc., New York.

Callista, A.R., 2009, *The Effect of Lot Size and Product Structure on Makespan Minimization in Multilevel Product Scheduling (due to 5 Levels of Product Structure with Maximum Parts are 3 in Each Level)*, Thesis in International Industrial Engineering Program, Faculty of Industrial Technology, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Carolina, M., 2008, *The Effect of Lot Size and Product Structure on Makespan Minimization in Multilevel Product Scheduling (due to 3 Levels of Product Structure with Maximum Parts are 3 in Each Level)*, Thesis in International Industrial Engineering Program, Faculty of Industrial Technology, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Gasperz, V., 2002, *Production Planning and Inventory Control-Berdasarkan Pendekatan Sistem Terintegrasi MRP II dan JIT Menuju Manufaktur 21*, Cetakan Ketiga, PT. Gramedia Pustaka Utama, Jakarta.

Hapsari, N.C., 2008, *The Effect of Lot Size and Product Structure on Makespan Minimization in Multilevel Product Scheduling (due to 3 Levels of Product Structure with Maximum Parts are 4 in Each Level)*, Thesis in International Industrial Engineering Program, Faculty of Industrial Technology, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Heizer, J., Rander, B., 2006, *Operations Management*, Eighth Edition, Pearson Education, Inc., New Jersey.

Lestianingsih, 2008, *Pengaruh Ukuran Lot terhadap Makespan Minimum dalam Penjadwalan Produk Multilevel (Studi terhadap Struktur Produk 2 Level Sampai 5 Level dengan Jumlah Item dalam Tiap Level adalah 1 Unit)*, Skripsi di Program Studi teknik Industri, Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Lind, D.A., Marchal, G.W., Wathen, S.A., 2007, *Teknik-teknik Statistika dalam Bisnis dan Ekonomi Menggunakan Kelompok Data Global*, Edisi 13, Salemba Empat, Jakarta.

Sari, K.A., 2008, *Pengaruh Ukuran Lot terhadap Makespan Minimum dalam Penjadwalan Produk Multilevel (Studi terhadap Struktur Produk 2 Level dengan Jumlah Item dalam Tiap Level adalah 1 Unit sampai 5 Unit)*, Skripsi di Program Studi teknik Industri, Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Sari, M.P., 2008, *Pengaruh Ukuran Lot terhadap Makespan Minimum dalam Penjadwalan Produk Multilevel (Studi terhadap Struktur Produk 2 Level Sampai 5 Level dengan Jumlah Item dalam Tiap Level adalah 2 Unit)*, Skripsi di Program Studi teknik Industri,

Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Suhendri, 2005, *Penjadwalan Flowshop dengan Pengalokasian Ulang Beban Mesin dan Operation Splitting*, Skripsi di Program Studi teknik Industri, Fakultas Teknologi Industri, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Wahana, 2006, *Seri Belajar Praktis Menguasai SPSS 13 untuk Statistik*, Salemba Infotek, Jakarta

Walpole, R.E., 1995, *Pengantar Statistika, Edisi Ketiga*, PT. Gramedia Pustaka Utama, Jakarta.

Wonnacott, R.J., Wonnacott, T.H., 1991, *Pengantar Statistika, Edisi Keempat*, Erlangga, Jakarta.

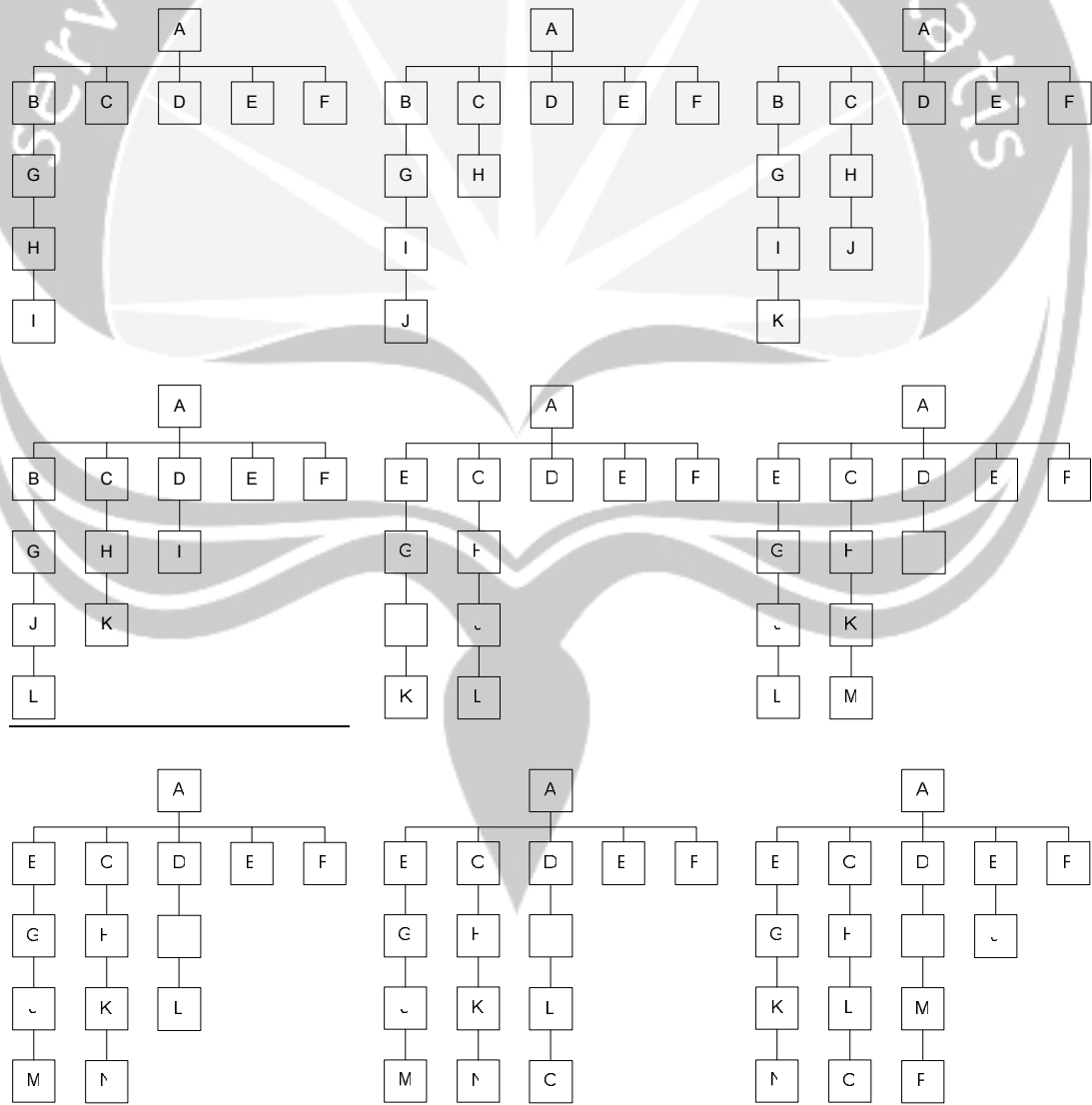
Yanti, 2009, *The Effect of Lot Size and Product Structure on Makespan Minimization in Multilevel Product Scheduling (due to 4 Levels of Product Structure with Maximum Parts are 3 in Each Level)*, Thesis in International Industrial Engineering Program, Faculty of Industrial Technology, Universitas Atma Jaya Yogyakarta, Yogyakarta.

Lampiran 1: Hasil pembangkitan *Bill of Material*

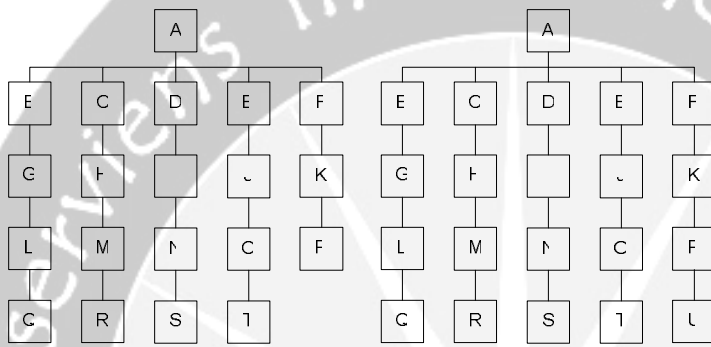
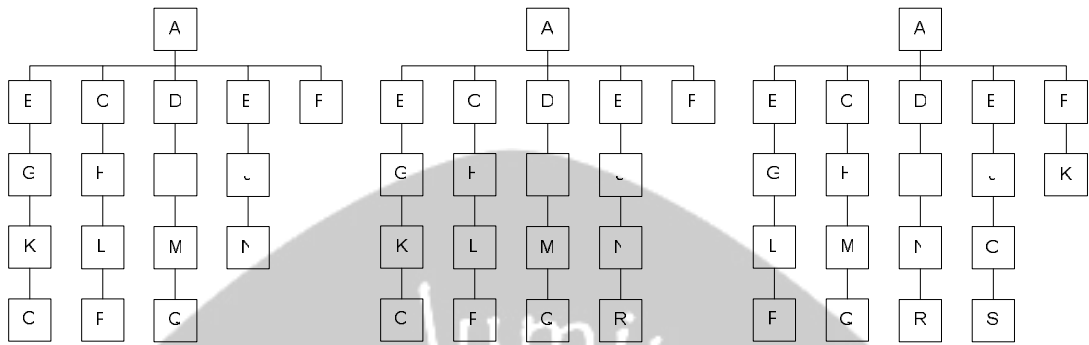
Keterangan:

1. *Bill of material* hasil pembangkitan dikelompokkan menjadi strata-strata berdasarkan variasi bentuk *bill of material*-nya.
2. *Bill of material* yang digaris bawah merupakan *bill of material* sampel dari strata tersebut.

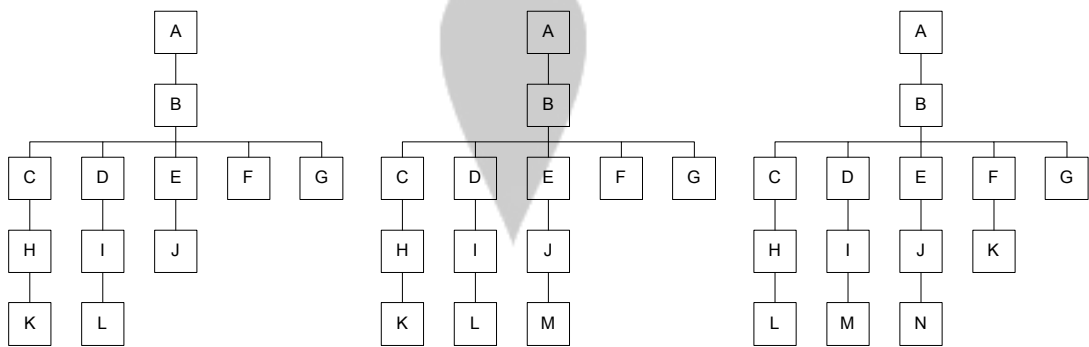
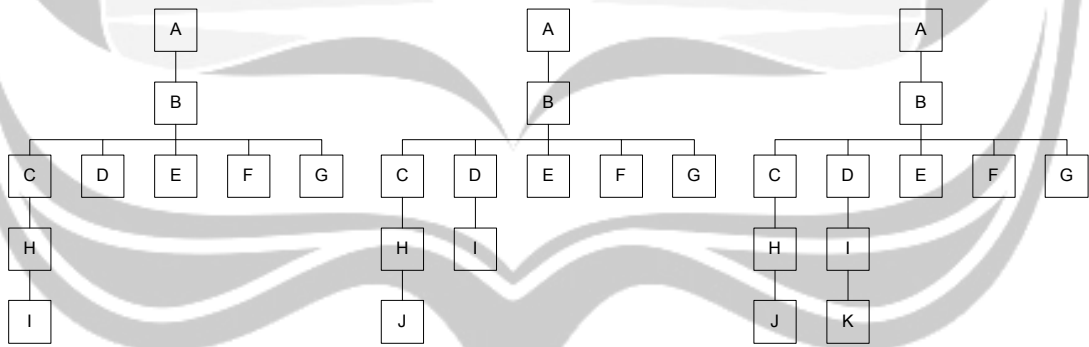
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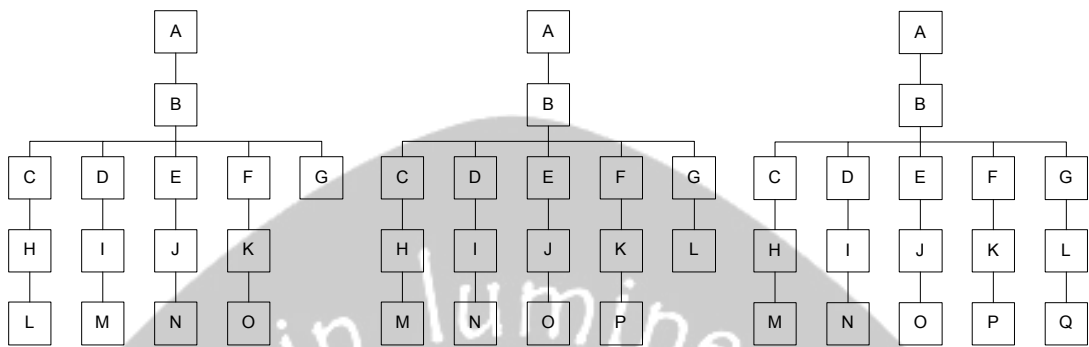
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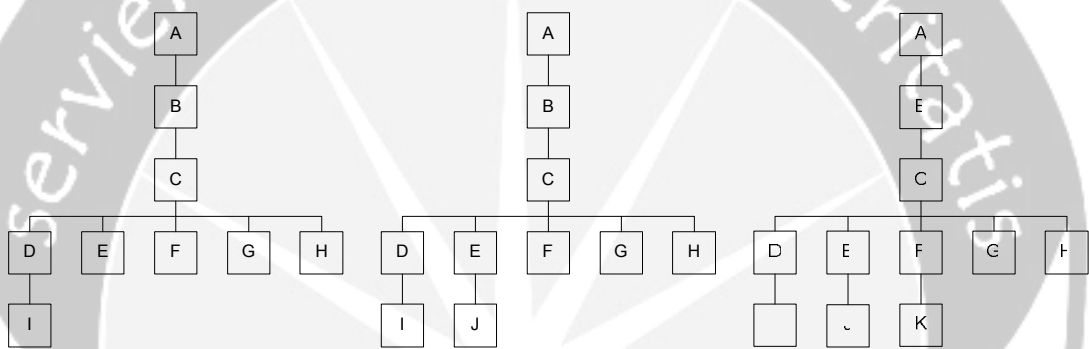
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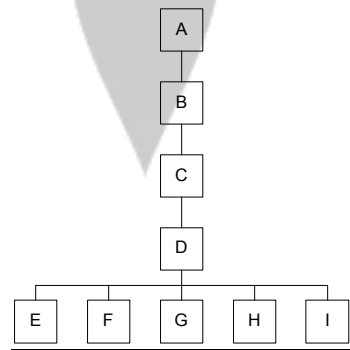
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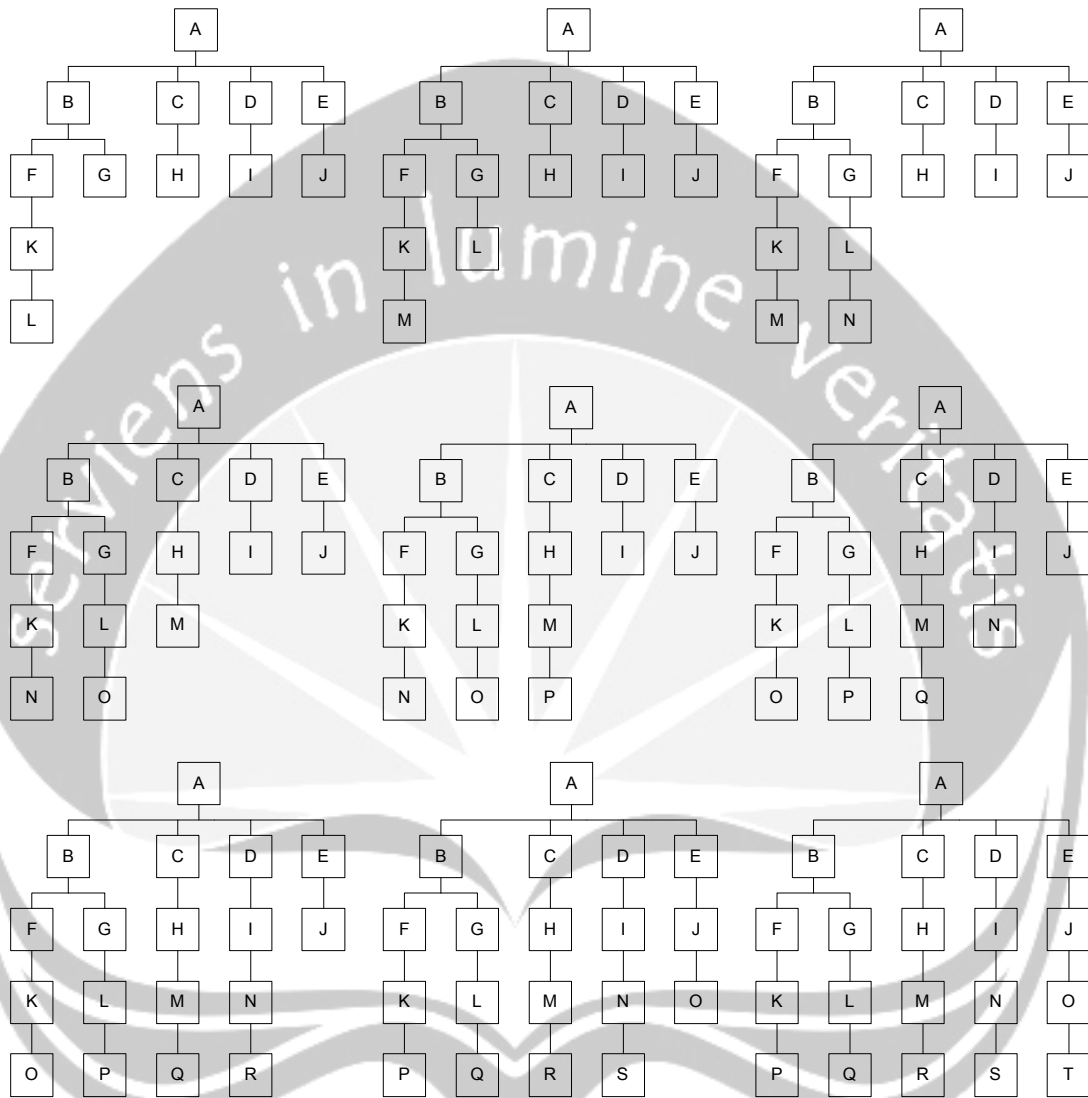


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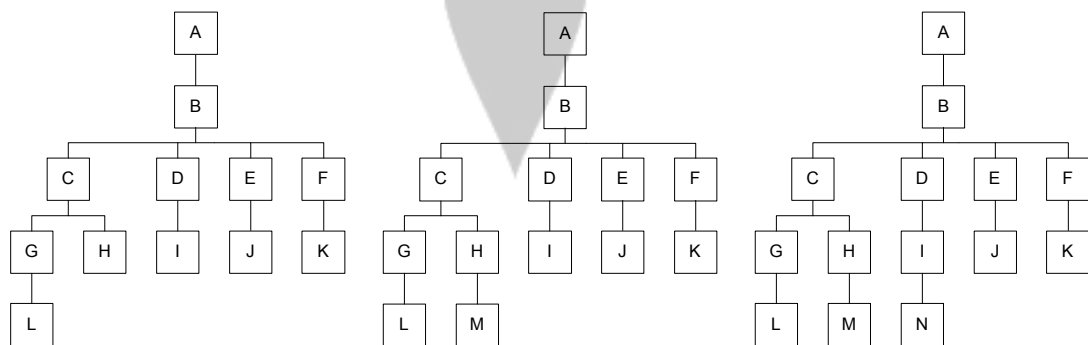


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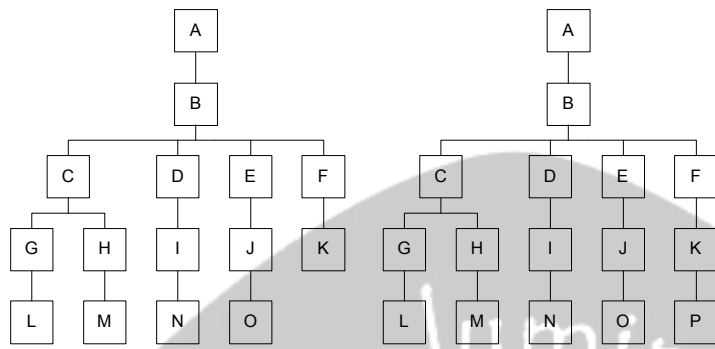


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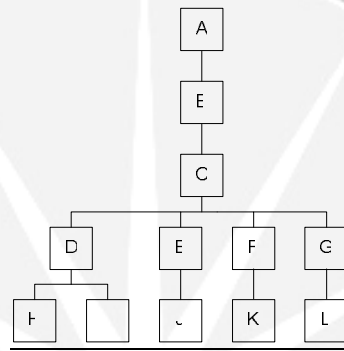




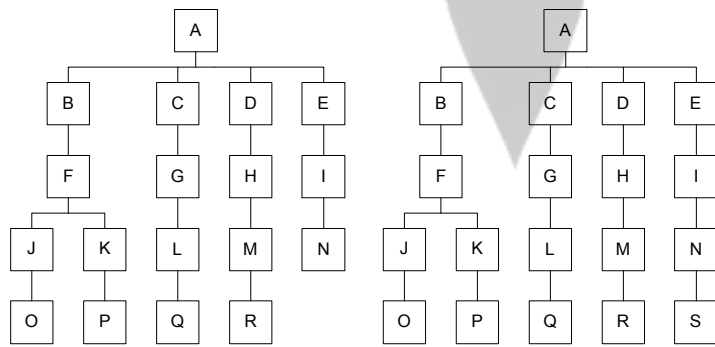
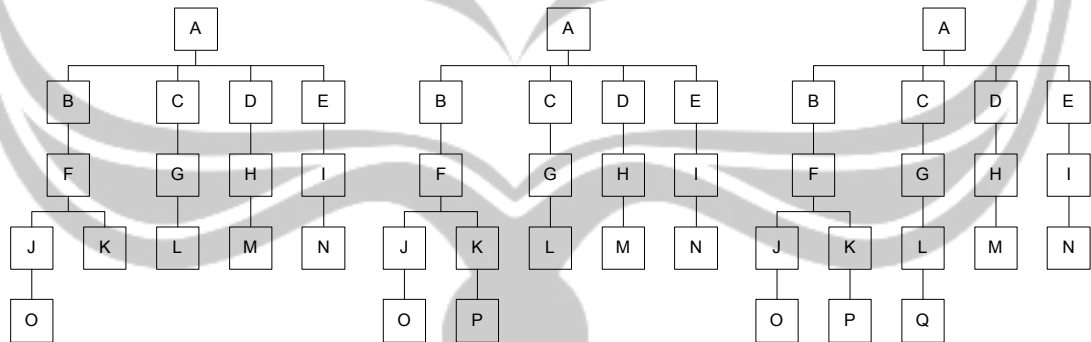
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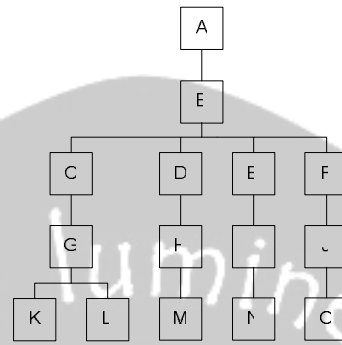


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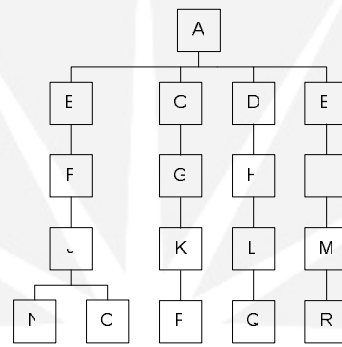


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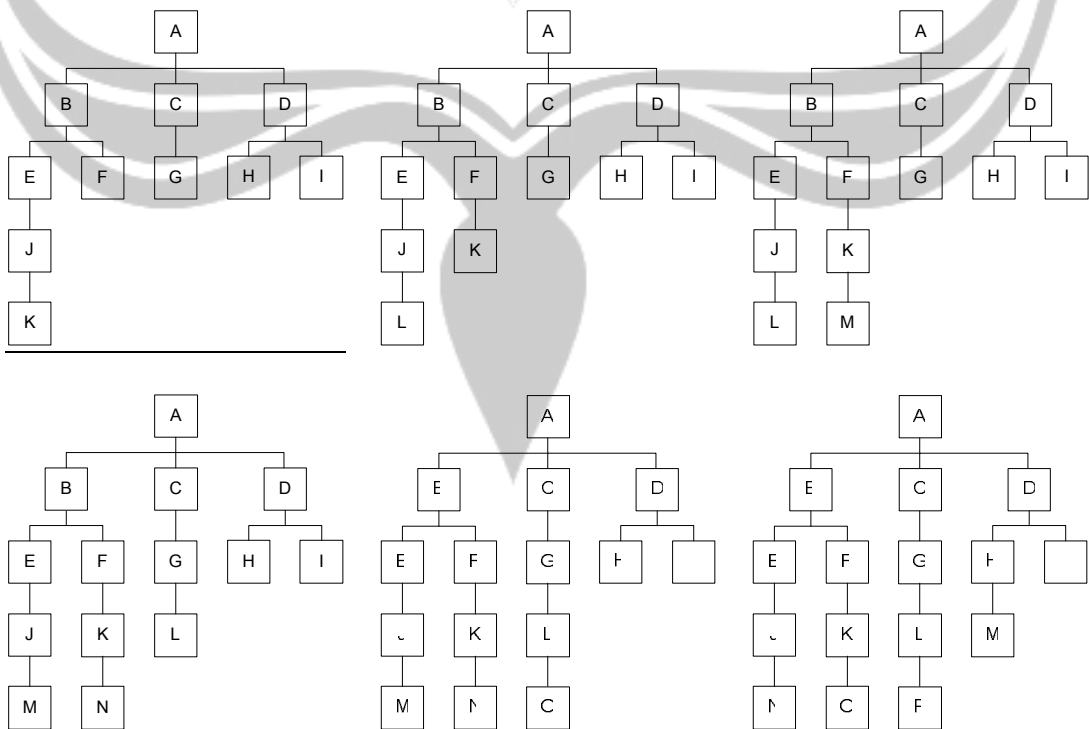
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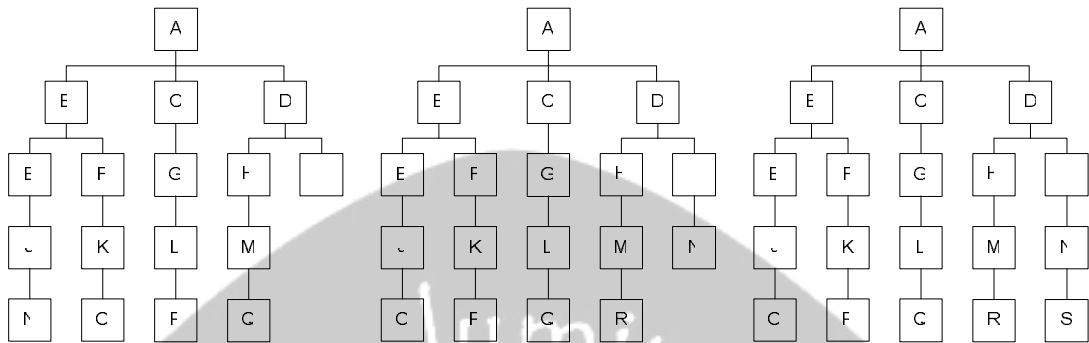
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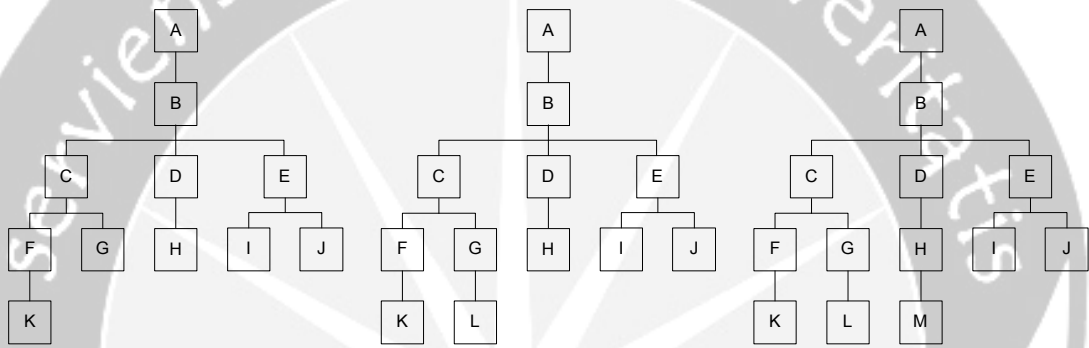
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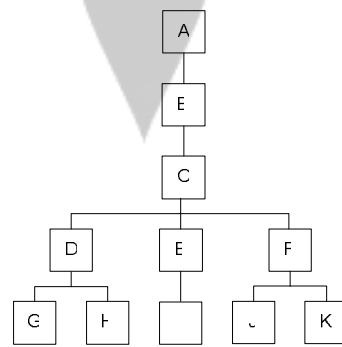
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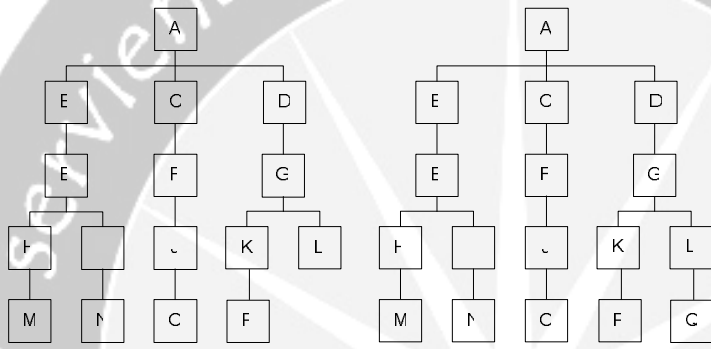
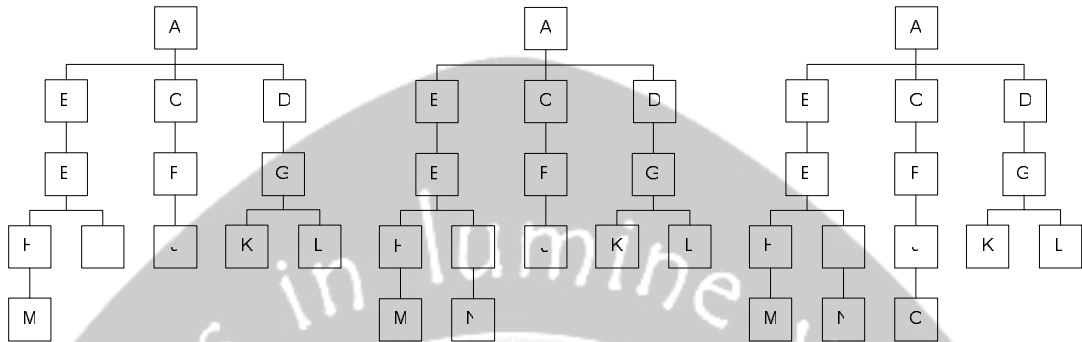


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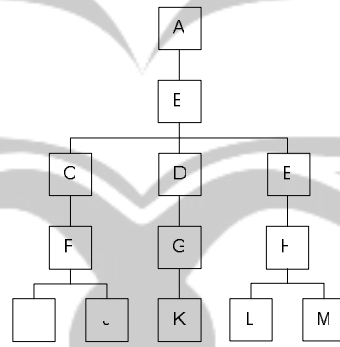


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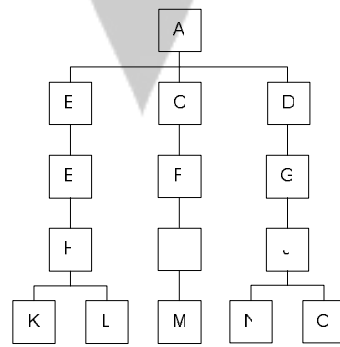
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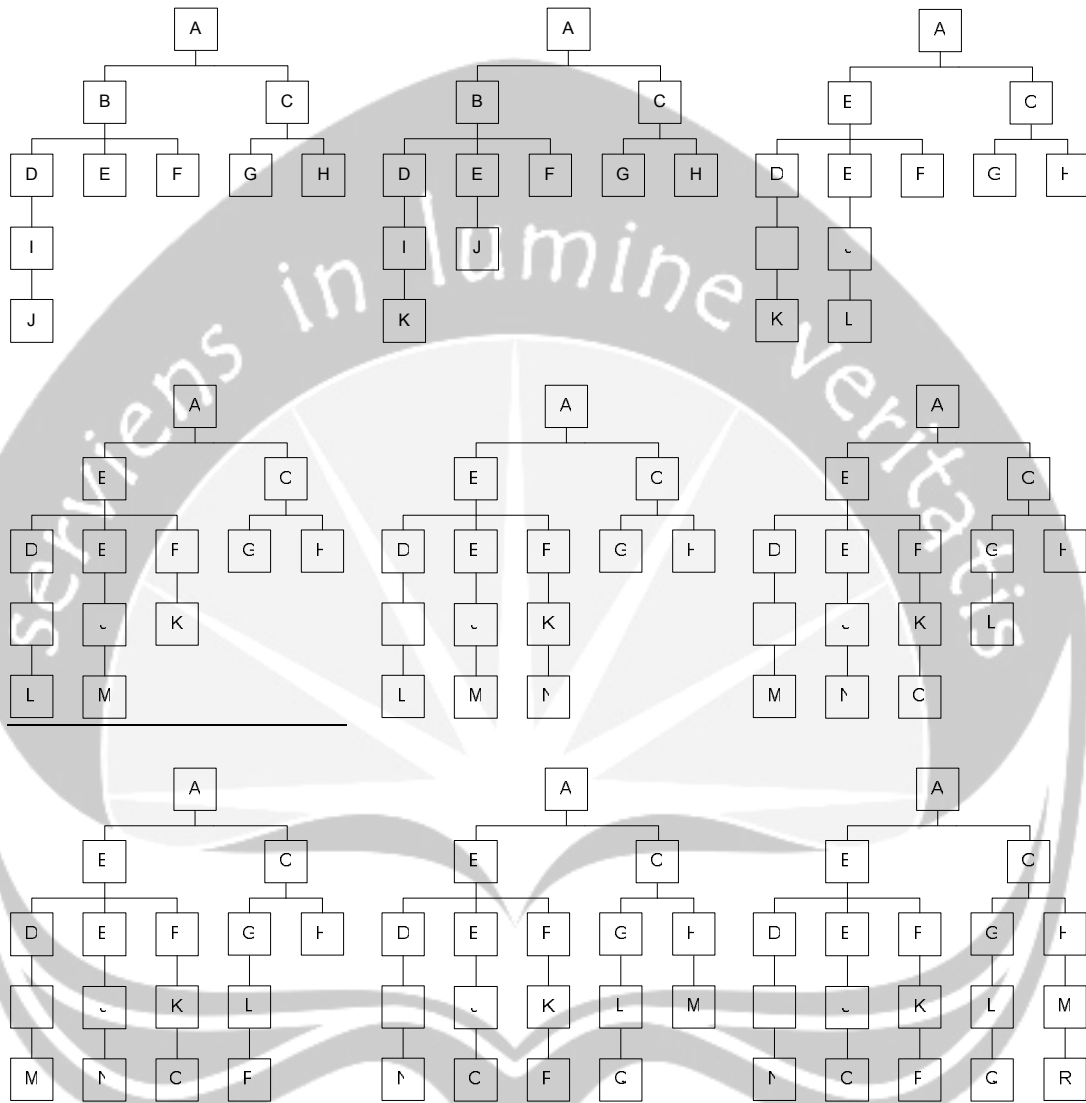


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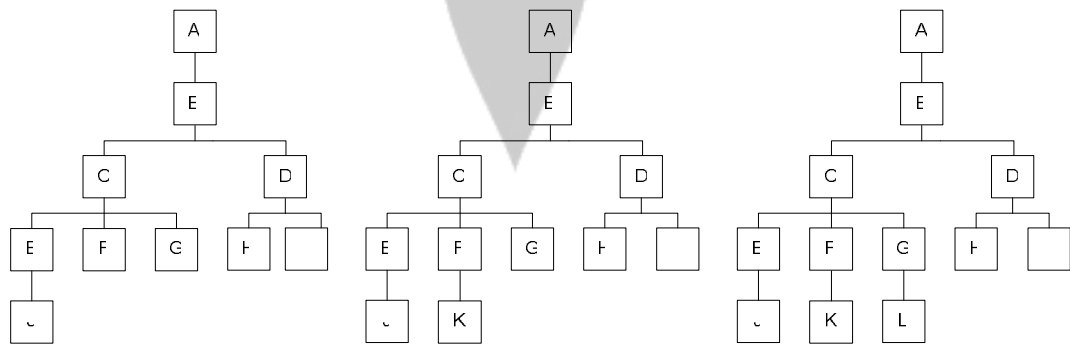


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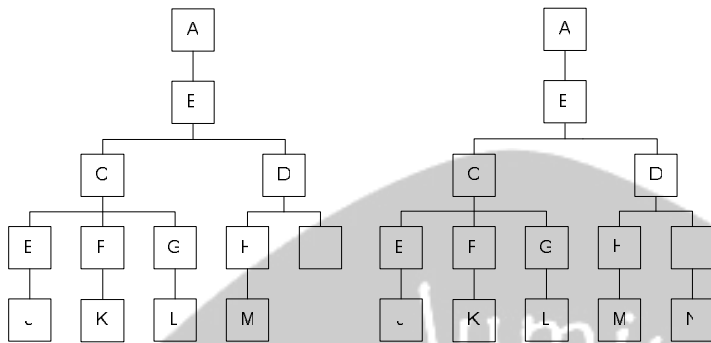
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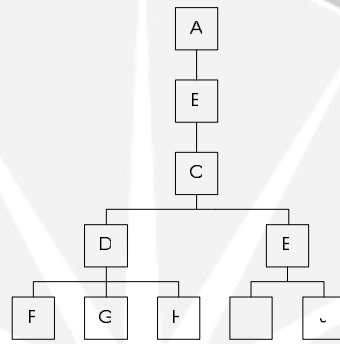
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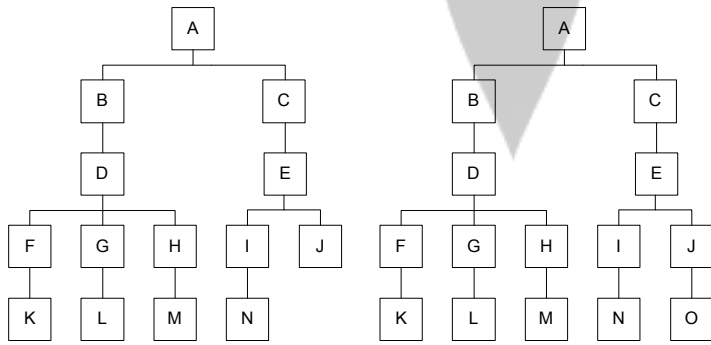
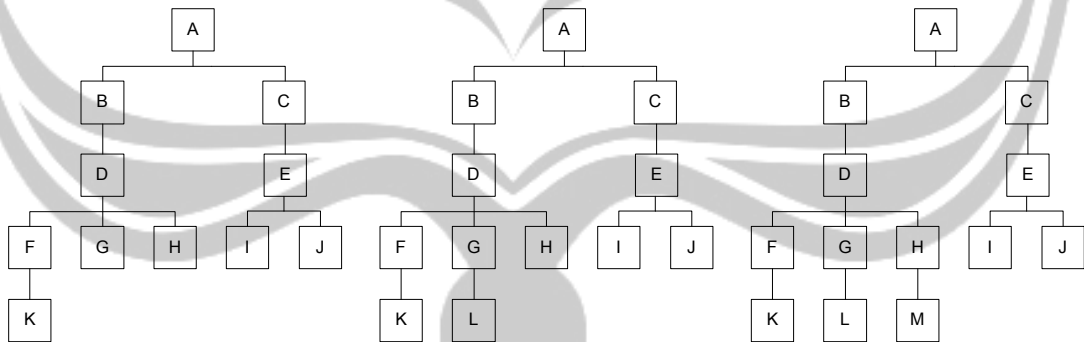
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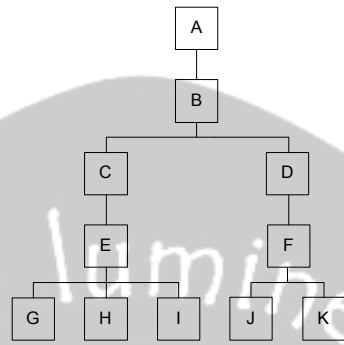


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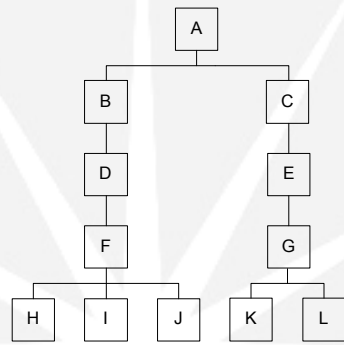


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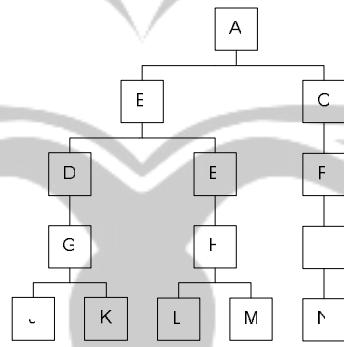
**Bill of Material Tipe 21**



**Bill of Material Tipe 22**



**Bill of Material Tipe 23**



**Bill of Material Tipe 24**

