Stats
DA.

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Que 1.

```
> data = matrix (c( 45, 55, 70, 905, 890, 870), ncol = 3, byrow=T)
> data
     [1] [2] [3]
[1]   45  55  70
[2]  905 890 870

> chisq.test (data)

        Pearson chi-squared test

data: data
X-squared = 6.2339, df = 2, p-value = 0.4429
```

Here, 0.04429 is less than 0.05 significant level.

⇒ So, we considered the shift and chance of defectivity to be dependent.

⇒ Proportion of defective is not the same for all three shifts.

Que 2.

```
>data = matrix (c (460,140,600,240, 160, 400, 700, 300, 1000),
                ncol = 3, byrow = 7)

> data
     [1]  [2]  [3]
[1]  460  140  600
[2]  240  160  400
[3]  700  300 1000
```

> chisq.test(data)

Pearson's chi-squared test

data: data

x-squared = 31.746, df = 4, p-value = $2.156e^{-06}$

Here, $2.156e^{-06}$ is less than 0.05 significant level

⇒ Economics condn. at home and IQ are dependent.

Que 3.

```
x <- 0:5
> f <- c(142,156,69,27,5,1)
> lambeda <- (sum(f*x)/sum(f))
> expf <- dpois(x, lambeda) * sum(f)
> ff = round(expf)
> ff
[1] 147 147 74 25 6 1
> obf <- c(142,156,69,33)
> exf <- c(147,147,74,32)
> chisq <- sum((c(obj-ef)^2/exf)
> chicy
[1] 1.090176
> qchisq(0.95,2)
[1] 5.991465
```

Sim., calculated value of $x^2 = 1.090176$ is less than 5.991465 ⇒ it is a good fit for given data

Que 4. Consider each prob. so i.e. 0.5.

```
> x = c(6,5,4,3,2,1,0)
n = 6
N = 80
e = 0.5
> obf <- c(5,18,28,12,7,6,4)
> exf <- dbinom(x,n,P)*80
> chisq <- sum((obf - exf)^2/exf)
> chisq
[1] 50.98667
> qchisq(0.95,5)
[1] 11.0705.
```

Calculated value of chi-squared is greater than the tabulated value, is significant at 5% level of significance. So, binomial distribution is not a good fit for the given data.

Que 5.

```
>data = c(9,10,12,9,12,6,14,8,14,9,11,11,11,9,13,7,
          13,10,11,8)
> batches = c("batch1","batch1","batch1","batch1","batch1",
              "batch2","batch2","batch2","batch2","batch2",
              "batch3","batch3","batch3","batch3","batch3",
              "batch4","batch4","batch4","batch4","batch4",
              "batch5","batch5","batch5","batch5","batch5")

>anova = aov(data ~ batches)
```

> anova

call:

aov (formula = data - batches)

terms:

	batches	Residuals
Sum of Sq.	4.80	91.75
Deg. of freed.	4	15

Residual standard error = 2.47319

Estimated effect may be unbalanced

> Summary (anova)

	Df	Sum-Sq	mean Sq	F-value	Pr(>F)
batches	4	4.80	1.200	0.196	0.937
Residuals	15	91.75	6.117		