

### Q3

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3. →	X	F	C.F			
	0 - 10	12	12			
	10 - 20	18	30			
	20 - 30	20	50			
	30 - 40	25	75			
	40 - 50	23	98			
	$N = \Sigma F = 98$					
$\text{No.} \rightarrow$						
$\text{Median} = \left( \frac{N}{2} \right)^{\text{th}}$						
$= \left( \frac{98}{2} \right)^{\text{th}} = 49^{\text{th}}$						
Median class interval is 20 - 30						
$\text{Median} = L + \left( \frac{\frac{N}{2} - C.F}{F} \right) \times i$ [∴ L = Lower limit i = Interval]						
$L = 20 \quad i = 10$						
$\text{Median} = 20 + \left( \frac{49 - 30}{20} \right) \times 10$						
$= 20 + \left( \frac{19}{20} \right) \times 10$						
$= 20 + 9.5 = 20 + 9.5$						
$\text{Median} \approx 29.5$						

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X	F	Mid value (m)	F <sub>m</sub>		
0 - 10	12	5	60		
10 - 20	18	15	270		
20 - 30	20	25	500		
30 - 40	25	35	875		
40 - 50	23	45	1035		
$\Sigma F = 98$		$\Sigma F_m = 2740$			
$\text{Mean } \bar{x} = \frac{\sum F_m}{\sum F}$					
$= \frac{2740}{98}$					
$= 27.95$					

Q4

= ...			
4. →	x	f	$f_x$
0	28		$f_0$
1	62		62
3	10		30
4	4		16
	$\sum f = 104$		$\sum f_x = 108$

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Mean of  $f_x$  distribution.  $= \frac{108}{104} = 1.03$

Mean of Binomial distribution  $= np = 1.03$

$p = \frac{1.03}{4}$

$P = \frac{1.03}{n}$

$p = \frac{1.03}{4} = 0.25$

Now,  $q = 1 - p = 1 - 0.25 = 0.75$

$x = 0, 1, 2, 3, 4$

Then,

$$P(x=0) = {}^4C_0 (0.25)^0 (0.75)^4 = 0.316$$

$$P(x=1) = {}^4C_1 (0.25)^1 (0.75)^3 = 0.421$$

$$P(x=2) = {}^4C_2 (0.25)^2 (0.75)^2 = 0.468$$

$$P(x=3) = {}^4C_3 (0.25)^3 (0.75)^1 = 0.089$$

$$P(x=4) = {}^4C_4 (0.25)^4 (0.75)^0 = 0.0039$$



Thus,

$x$	$p(x)$	Expected freq. ( $N \times p(x)$ )	$\left[ \because N = \sum f \right]$
0	0.316	32.86 $\sim$ 33	
1	0.421	43.78 $\sim$ 44	
3	0.468	48.67 $\sim$ 49	
4	0.0039	0.4056 $\sim$ 0	

$$\sum np(x) = 126.$$

$$\sum Np(x) = 126$$