								STA	FISTICS							
1.	Cons	sider t	he gi	ven c	lata v	vith	frequer	cy distribut	ion			[J]	EE(A	dvance	ed) 2023]	
	x _i	3	8	11	10	5	4									
	\mathbf{f}_{i}	5	2	3	2	4	4									U.
	Mate	h eac	h ent	ry in	List-	-I to	the cor	rect entries	in List-II.						- Com	\sim
						List	t-I					List-II			11	
	(P) T	The m	ean o	of the	abov	ve da	ta is					(1) 2.5	5		\mathcal{I}	
	(Q) 7	Гhe m	ediar	n of tl	he ab	ove	data is					(2) 5	~			
	(R) 1	The m	ean c	leviat	tion a	abour	t the mo	ean of the al	oove data is			(3) 6				
	(S) T	The m	ean d	leviat	ion a	bout	the me	edian of the	above data	is		(4) 2.7	7			
											\sim	(5) 2.4	4			
	The o	correc	et opt	ion is	5:					/	< C	037				
	(A) ($(P) \rightarrow$	(3)	(Q) –	→ (2)	(R)	\rightarrow (4)	$(S) \rightarrow (5)$		1	5					
	(B) ($P) \rightarrow$	(3)	(Q) –	→ (2)	(R)	\rightarrow (1)	$(S) \rightarrow (5)$	1	7.	\checkmark					
	(C) ($P) \rightarrow$	(2)	(Q) –	→ (3)	(R)	\rightarrow (4)	$(S) \rightarrow (1)$	\sim	1						
	(D) ($(P) \rightarrow$	(3)	(Q) –	→ (3)	(R)	\rightarrow (5)	$(S) \rightarrow (5)$	11							
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JEE Advanced Mathematics 10 Years Topicwise Questions with Solutions

1. Ans. (A) Sol. x_i 3 4 5 8 10 11 f_i 5 4 4 2 2 3 (P) Mean (Q) Median (R) Mean deviation about mean (S) Mean deviation about median $\overline{3 \ 5 \ 15 \ 5 \ 3} \ 4 \ 16 \ 9 \ 2 \ 5 \ 15 \ 3 \ 4 \ 16 \ 9 \ 2 \ 2 \ 13 \ 1 \ 2 \ 10 \ 15 \ 2 \ 2 \ 20 \ 17 \ 4 \ 11 \ 3 \ 3 \ 3 \ 20 \ 5 \ 5 \ 10 \ 11 \ 13 \ 2 \ 2 \ 20 \ 17 \ 4 \ 11 \ 3 \ 3 \ 3 \ 20 \ 5 \ 5 \ 5 \ 10 \ 10 \ 5 \ 5 \ 5 \ 10 \ 10$				S	OLUTIO	NS				
Sol. $x_i = 3$ 4 5 8 10 11 $f_i = 5$ 4 4 2 2 3 (P) Mean (Q) Median (R) Mean deviation about mean (S) Mean deviation about median $\frac{\overline{x_i + \frac{1}{5} + \frac{x_i f_i}{5} + \frac{C.F.}{5} + \frac{ x_i - Mean }{3} + \frac{1}{2} +$	1.	An	is. (A)							
$f_{i} = 5 = 4 = 4 = 2 = 2 = 3$ (P) Mean (Q) Median (R) Mean deviation about mean (S) Mean deviation about median $\frac{\overline{x} = \frac{1}{5} = \frac{1}{15} + \frac{1}{5} + $	Sol.	Xi	3	4	5	8	10	11		
$ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	~ • • •	۰۰-۱ ۲	5		4	° 2	2	2		
(P) Mean (Q) Median (R) Mean deviation about mean (S) Mean deviation about median $\frac{\overline{x} \overline{t}_{1} \overline{x}_{1} \overline{t}_{1} \overline{x}_{1} \overline{t}_{1} \overline{x}_{1} \overline{t}_{1} \overline{x}_{1} $		Ii	2	4	4	2	2	3		
(Q) Median (R) Mean deviation about mean (S) Mean deviation about median $\frac{\overline{x} \overline{x} \overline{x} $		(P)) Mean							
(R) Mean deviation about media (S) Mean deviation about median $\frac{\overline{x_{1}} \overline{x_{1}} \overline{x_{1}}$		(Q) Mediai	n						
(5) Mean deviation about median $\frac{\overline{x_{i}} \overline{f_{i}} x_{i}f_{i}}{3 5 15 5 2} x_{i} - Mean }{3 4 4 16 9 2} \\ \frac{\overline{x_{i}} \overline{x_{i}} 16 15 2}{2 17 4 1} \\ \frac{\overline{x_{i}} -Mean }{11 2 \cdot 1_{i} = 20 x_{i}f_{i} = 120} \\ \hline \overline{f_{i}} x_{i} - Mean x_{i} - Median \overline{f_{i}} x_{i} - Median } \\ \frac{\overline{f_{i}} x_{i} - Mean }{15 2 10 10 1} \\ \hline \overline{f_{i}} x_{i} - Mean - 54 0 16 \\ \hline \overline{x_{f_{i}}} = \frac{120 x_{i}f_{i}}{16 15 2} \\ \hline (P) Mean = \frac{\sum x_{i}f_{i}}{\sum f_{i}} = \frac{120}{20} = 6 \\ \hline (Q) Median = \left(\frac{20}{2}\right)^{6} \\ \text{observation = 10^{6} observation = 5} \\ \hline (R) Mean deviation about mean \\ - \frac{\sum f_{i}\left[x_{i} - Mean\right]}{\sum f_{i}} = \frac{54}{20} = 2.70 \\ \hline (S) Mean deviation about median \\ - \frac{\sum f_{i}\left[x_{i} - Mean\right]}{\sum f_{i}} = \frac{48}{20} = 2.40 \\ \hline \end{array}$		(R) Mean deviation about mean								
$\frac{x_{1}}{3} + \frac{f_{1}}{5} + \frac{x_{1}f_{1}}{15} + \frac{C.F.}{5} + \frac{ x_{1} - Mean }{3} + \frac{1}{4} + \frac{1}{16} + \frac{9}{9} + \frac{2}{2} + \frac{1}{5} + \frac{1}{16} + \frac{1}{15} + \frac{2}{2} + \frac{1}{16} + \frac{1}{15} + \frac{2}{2} + \frac{1}{16} + \frac{1}{15} + \frac{2}{2} + \frac{1}{10} + \frac{1}{11} + \frac{1}{3} + \frac{3}{33} + \frac{2}{20} + \frac{5}{5} + \frac{1}{10} + \frac{1}{11} + \frac{1}{3} + \frac{1}{33} + \frac{1}{20} + \frac{4}{11} + \frac{4}{4} + \frac{4}{0} + \frac{0}{0} + \frac{0}{0} + \frac{1}{4} + \frac{1}{3} + \frac{4}{6} + \frac{4}{3} + \frac{1}{3} + \frac{4}{6} + \frac{4}{3} + \frac{3}{6} + \frac{6}{18} + \frac{1}{10} + \frac{4}{11} + \frac{4}{4} + \frac{1}{3} + \frac{4}{6} + \frac{4}{3} + \frac{3}{6} + \frac{6}{18} + \frac{1}{10} + \frac{4}{4} + \frac{3}{3} + \frac{6}{6} + \frac{1}{18} + \frac{1}{15} + \frac{1}{20} +$		(S)) Mean d	levia	tion abou	t m	edian			
$\frac{3}{4} \frac{5}{4} \frac{15}{4} \frac{5}{2} \frac{3}{3} \frac{3}{4} \frac{16}{4} \frac{9}{2} \frac{2}{2} \frac{5}{5} \frac{4}{4} \frac{20}{13} \frac{13}{1} \frac{1}{1} \frac{1}{15} \frac{5}{2} \frac{2}{20} \frac{17}{17} \frac{4}{4} \frac{11}{11} \frac{3}{2} \frac{33}{33} \frac{20}{20} \frac{5}{5} \frac{5}{10} \frac{11}{12} \frac{5}{2} \frac{1}{2} \frac{20}{2} \frac{17}{2} \frac{4}{4} \frac{1}{4} \frac{1}{4} \frac{4}{4} \frac{1}{3} \frac{6}{6} \frac{8}{8} \frac{1}{1} \frac{4}{4} \frac{4}{4} \frac{3}{3} \frac{6}{6} \frac{8}{8} \frac{5}{5} \frac{10}{10} \frac{15}{15} \frac{6}{6} \frac{18}{18} \frac{15}{2} \frac{1}{10} \frac{1}{15} \frac{5}{16} \frac{6}{18} \frac{15}{18} \frac{1}{16} \frac{1}{16} \frac{1}{15} \frac{1}{20} = 6$ (P) Mean = $\frac{\Sigma x_1 f_1}{\Sigma f_1} = \frac{120}{20} = 6$ (Q) Median = $\left(\frac{20}{2}\right)^{46}$ observation = 10 ⁴⁶ observation = 5 (R) Mean deviation about mean $= \frac{\Sigma f_1 x_1 - \text{Median} }{\Sigma f_1} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_1 x_1 - \text{Median} }{\Sigma f_1} = \frac{48}{20} = 2.40$	x	1	$\mathbf{f}_{\mathbf{i}}$		$x_i f_i$		C.F.	x _i	Mean	
$\frac{4}{5} + \frac{4}{4} + \frac{16}{20} + \frac{9}{13} + \frac{2}{16} + \frac{1}{15} + \frac{2}{2} + \frac{1}{10} + \frac{1}{2} + \frac{2}{20} + \frac{1}{17} + \frac{4}{4} + \frac{1}{11} + \frac{3}{3} + \frac{3}{33} + \frac{2}{20} + \frac{5}{5} + \frac{5}{10} + \frac{5}{5} + \frac{1}{120} + \frac{5}{5} + \frac{1}{120} + \frac{5}{5} + \frac{1}{120} + \frac{5}{5} + \frac{1}{10} + \frac{4}{4} + \frac{4}{4} + \frac{6}{0} + \frac{6}{0} + \frac{6}{18} + \frac{5}{5} + \frac{1}{10} + \frac{4}{4} + \frac{4}{3} + \frac{6}{6} + \frac{6}{18} + \frac{5}{5} + \frac{1}{10} + \frac{1}{5} + \frac{5}{6} + \frac{1}{18} + \frac{5}{5} + \frac{1}{10} + \frac{5}{26} + \frac{5}{10} + \frac{5}{26} + \frac{1}{20} + \frac{5}{20} + \frac{5}{2$	3	;	5		15		5		3	
$\frac{5}{8} \frac{4}{2} \frac{20}{16} \frac{13}{15} \frac{1}{2} \frac{1}{16} \frac{1}{15} \frac{2}{2} \frac{1}{16} \frac{1}{15} \frac{2}{2} \frac{1}{16} \frac{1}{17} \frac{1}{4} \frac{1}{4} \frac{1}{11} \frac{3}{3} \frac{33}{33} \frac{20}{20} \frac{5}{5} \frac{1}{5} \frac{5}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{2} \frac{1}{5} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{6} \frac{1}{18} \frac{1}{5} \frac{1}{6} \frac{1}{18} \frac{1}{5} \frac{1}{5} \frac{1}{6} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{6} \frac{1}{5} \frac{1}{5} \frac{1}{5} \frac{1}{20} = 6$ (Q) Median = $\frac{\sum x_i f_i}{25} \frac{1}{20} = 6$ (Q) Median = $\left(\frac{20}{2}\right)^{th}$ observation = 10 th observation = 5 (R) Mean deviation about mean $= \frac{\sum f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\sum f_i x_i - Meain }{\Sigma f_i} = \frac{48}{20} = 2.40$	4	1	4		16		9		2	
$\frac{10}{11} \frac{2}{20} \frac{17}{17} \frac{4}{4}$ $\frac{11}{11} \frac{3}{3} \frac{33}{33} \frac{20}{20} \frac{5}{5}$ $\frac{15f_i - Mean}{15f_i = 20} \frac{1x_i - Median}{15f_i = 120}$ $\frac{f_i x_i - Mean }{15f_i = 20} \frac{1}{2x_i f_i} \frac{1}{10}$ $\frac{1}{8} \frac{1}{4} \frac{4}{0} \frac{0}{0}$ $\frac{4}{4} \frac{3}{3} \frac{6}{6}$ $\frac{8}{5} \frac{5}{10}$ $\frac{1}{15} \frac{6}{18} \frac{1}{18}$ $\frac{1}{2f_i x_i - Mean = 54} \frac{5f_i x_i - Median = 48}{5f_i x_i - Median = 48}$ $(P) Mean = \frac{2x_i f_i}{2f_i} = \frac{120}{20} = 6$ $(Q) Median = \left(\frac{20}{2}\right)^{th}$ $observation = 10^{th} observation = 5$ $(R) Mean deviation about mean$ $= \frac{2f_i x_i - Mean }{2f_i} = \frac{54}{20} = 2.70$ $(S) Mean deviation about median$ $= \frac{2f_i x_i - Median }{2f_i} = \frac{48}{20} = 2.40$	5	5	4	_	20	-	13		1	5.
$\frac{11}{12} \frac{3}{12} \frac{33}{12} \frac{20}{12} \frac{5}{5}$ $\frac{11}{5} \frac{12}{5} \frac{120}{5} \frac{5}{5} \frac{5}{5} \frac{10}{5} \frac{1}{5} \frac{1}{5$	1	0	2		20		13		4	0
$\frac{ \Sigma f_{i} = 20 \ \Sigma x_{i} f_{i} = 120 }{ \Sigma i_{i} - Median X_{i} - Median I_{i} - Median } I_{i} - Median } I_{i} - Median I_{i} - M$	1	1	3		33		20		5	
$\frac{f_{i} x_{i} - Mean }{15} = \frac{ x_{i} - Median }{2} = \frac{f_{i} x_{i} - Median }{10} = \frac{15}{2} = \frac{10}{10} = \frac{8}{8} = \frac{1}{1} = \frac{4}{4} = \frac{4}{4} = \frac{4}{9} = \frac{1}{9} = \frac{1}{9} = \frac{1}{10} = \frac{1}{10$			$\Sigma f_i = 20$) Σ	$\mathbf{x}_{i}\mathbf{f}_{i} = 120$					
$\frac{15}{15} + \frac{17}{2} + \frac{10}{10} + \frac{10}$	fi	Xi –	Mean		x _i – Media	an	f _i x	_i – Me	dian	
$\frac{8}{4} = \frac{1}{0} = \frac{4}{0} = \frac{4}$			15		2			10	·	
$\frac{4}{4} \qquad 0 \qquad 0$ $\frac{4}{4} \qquad 0 \qquad 0$ $\frac{4}{4} \qquad 3 \qquad 6$ $\frac{8}{5} \qquad 10$ $\frac{15}{15} \qquad 6 \qquad 18$ $\frac{2f_i x_i - Mean = 54}{\Sigma f_i} = \frac{120}{20} = 6$ (Q) Median = $\left(\frac{20}{2}\right)^{th}$ observation = 10 th observation = 5 (R) Mean deviation about mean $= \frac{\Sigma f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$	ļ		8		1			4		
$\frac{1}{2} \frac{1}{15} \frac{1}{15} \frac{1}{6} \frac{1}{20} \frac{1}{18} \frac{1}{20} 1$			4	_	$\frac{0}{3}$			0		
$\frac{15}{\Sigma f_i x_i - Mean = 54} = \frac{6}{\Sigma f_i x_i - Median = 48}$ (P) Mean = $\frac{\Sigma x_i f_i}{\Sigma f_i} = \frac{120}{20} = 6$ (Q) Median = $\left(\frac{20}{2}\right)^{th}$ observation = 10 th observation = 5 (R) Mean deviation about mean $= \frac{\Sigma f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$			8		5			10	~~~	
2 $\frac{[2T_{i} x_{i} - Mean] = 34}{(P) Mean} = \frac{\sum x_{i} f_{i}}{\sum f_{i}} = \frac{120}{20} = 6$ (Q) $Median = \left(\frac{20}{2}\right)^{th}$ observation = 10 th observation = 5 (R) Mean deviation about mean $= \frac{\sum f_{i} x_{i} - Mean }{\sum f_{i}} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\sum f_{i} x_{i} - Median }{\sum f_{i}} = \frac{48}{20} = 2.40$			15		6			18	L 40	-
(P) Mean = $\frac{\Sigma x_i f_i}{\Sigma f_i} = \frac{120}{20} = 6$ (Q) Median = $\left(\frac{20}{2}\right)^{th}$ observation = 10 th observation = 5 (R) Mean deviation about mean $= \frac{\Sigma f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$	$\Sigma I_i X_i$	$-\mathbf{N}$	ean = 5	4			$\Sigma I_i X_i -$	Media	an = 48	-
$(Q) \text{ Median} = \left(\frac{20}{2}\right)^{\text{th}}$ $observation = 10^{\text{th}} \text{ observation} = 5$ $(R) \text{ Mean deviation about mean}$ $= \frac{\Sigma f_i x_i - \text{Mean} }{\Sigma f_i} = \frac{54}{20} = 2.70$ $(S) \text{ Mean deviation about median}$ $= \frac{\Sigma f_i x_i - \text{Median} }{\Sigma f_i} = \frac{48}{20} = 2.40$		(P)) Mean	$=\frac{\Sigma}{2}$	$\frac{\Sigma x_i f_i}{\Sigma f_i} = \frac{12}{20}$	$\frac{0}{0} =$	= 6	1		
(2) observation = 10 th observation = 5 (R) Mean deviation about mean $= \frac{\Sigma f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$ 2		(Q) Media	an =	$\left(\frac{20}{2}\right)^{\text{th}}$		\leq			
(R) Mean deviation about mean $= \frac{\Sigma f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$			observ	ratio	(2) n = 10 th o	bse	rvation	= 5		
(it) Heat deviation about include $= \frac{\Sigma f_i x_i - Mean }{\Sigma f_i} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$ 2		(P)) Mean	devi	ation abou	ıt n	nean			
$= \frac{\Sigma \mathbf{f}_{i} \mathbf{x}_{i} - \text{Mean} }{\Sigma \mathbf{f}_{i}} = \frac{54}{20} = 2.70$ (S) Mean deviation about median $= \frac{\Sigma \mathbf{f}_{i} \mathbf{x}_{i} - \text{Median} }{\Sigma \mathbf{f}_{i}} = \frac{48}{20} = 2.40$		(n				AL 11				
(S) Mean deviation about median $= \frac{\Sigma f_i x_i - Median }{\Sigma f_i} = \frac{48}{20} = 2.40$ 2		0	$=\frac{\Sigma f_i}{}$	$\frac{\mathbf{x}_{i}}{\Sigma}$	$\frac{ Mean }{f_i} =$	$\frac{54}{20}$				
$= \frac{\Sigma f_i \left x_i - Median \right }{\Sigma f_i} = \frac{48}{20} = 2.40$	7	(S)	Mean	devi	ation abou	ıt n				
$= \frac{1}{\Sigma f_i} = \frac{1}{20} = 2.40$	1		Σf_i	x . –	Median					
2				Σ	Ef	=-	$\frac{1}{20} = 2.$	40		
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