FIRST YEAR HIGHER SECONDARY EXAMINATION SAY/IMP SEPTEMBER 2016

(Scheme of Valuation)

Subject : Statistics **Code No. 420**

Qn. No	Sub Qn	Scoring Indicators	Split Score	Total Score
1.		(b) 10	1	1
2.	a.	58, 65, 72, 77 Median $\frac{137}{2} = 68.5$	½	
		Mean = 68	½	
	b.	Yes, Mean = $\frac{58+65+72+77+70}{5}$ = 68.4	1	2
3.	a.	i) $\Sigma(x-28)^2$	1	
	b.	$n_1 = 100$ $n_2 = 120$		
		$\bar{x}_1 = 15000$ $\bar{x}_2 = 16500$		
		$\bar{x} = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1+n_2}$	1	
		$= \frac{100\times15000+120\times16500}{100+120}$	1	
		= 15818.18	1	4
4.		Class f Frequency table	2	
		0-10 15 Modal class 60-70		
		10-20 20		
		20-30 25 Mode $= l + \frac{(f_1-f_0)c}{2f_1-f_0-f_2}$	1	
		30-40 24		
		40-50 18 $= 60 + \frac{(71-31)10}{2\times71-31-52}$	1	
		50-60 31		
		60-70 71		
		70-80 52 = 66.78	1	5
5.	a.	(c) Acturial Science	1	
	b.	Note on NSSO		
		at least 2 points	2	3

Qn.No	Sub. Q.	Scoring Indicators	Split Score	Total Score
6.	a.	(b) $P(A)+P(B)$	1	
	b.	$P(\text{all are non defective}) = \frac{40C_4}{50C_4}$	1	
		$P(\text{all are defective}) = \frac{10C_4}{50C_4}$	1	3
7.	a)	~~a)~~ P(atleast one of the event occure) = $P(A \cup B)$		
		$= P(A)+P(B)-P(AB) = .4$	½	
	b)	P(exactly one of the event occure)		
		$= P(A\bar{B}) + P(\bar{A}B)$	½	
		$= P(A) - P(AB) + P(B) - P(AB)$	½	
		$= .3 - .1 + .2 - .1$	½	
		$= .3$	½	
	c)	P(none of them occure)		
		$= 1 - P(A \cup B) = 1 - .4 = .6$	½	3
8	a)	$P(A \cap B) = P(A) + P(B) - P(A \cup B)$	½	
		$= \frac{1}{4} + \frac{2}{5} - \frac{1}{2} = \frac{3}{20}$	½	
	b)	$P(A\bar{B}) = P(A) - P(A \cap B)$	½	
		$= \frac{1}{4} - \frac{3}{20} = \frac{1}{10}$	½	
	c)	$P(\bar{A} \cup \bar{B}) = 1 - P(A \cap B)$	½	
		$= 1 - \frac{3}{20} = \frac{17}{20}$	½	3
9.	a)	ii) are literate	1	
	b)	(i) Discrete (ii) Continuous		
		(iii) Discrete (iv) Continuous	2	3

Qn.No		Scoring Indicators	Split Score	Total Score
10		Explanation of FGD	2	2
11.		c) 26^{15}	1	1
12.		State → Districts → villages → households OR any other stages	3	3
13.		b) 12	1	1
14.		Age f cf 15 4 4 16 6 10 17 10 20 18 15 35 19 12 47 20 9 56 21 4 60	1	
		Q_1 = Size of $\left(\frac{N+1}{4}\right)^{15}$ item = 15 25^{15} item = 17	½	
		Q_3 = Size of $3\left(\frac{N+1}{4}\right)^{15}$ item = 45 75^{15} item = 19	½	
		$Q.D = \frac{Q_3 - Q_1}{2}$ $= \frac{19-17}{2} = 1$	½ ½	3
15		a) 14	1	1

Qn.No		Scoring Indicators	Split Score	Total Score
16		Median = Value of $\left(\frac{9+1}{2}\right)^{th}$ item		
		= Value of 5^{th} item = 60	1	
		$MD = \frac{\Sigma \lvert x - \text{Median} \rvert}{N}$	1	
		$= \frac{10+8+5+3+0+1+4+5+7}{9}$	2	
		$= \frac{43}{9} = 4.78$ kg.	1	5
17.		Class f. x. fx fx^2		
		95-105 19 100 1900 190000		
		105-115 23 110 2530 278300		
		115-125 36 120 4320 518400		
		125-135 70 130 9100 1183000		
		135-145 52 140 7280 1019200		
		200 2,5130 31,88,900	3	
		$\sigma = \sqrt{\frac{\Sigma fx^2}{N} - (\bar{x})^2}$	½	
		$\bar{x} = \frac{\Sigma fx}{N} = \frac{25130}{200} = 125.65$	½	
		$\sigma = \sqrt{\frac{3188900}{200} - (125.65)^2}$		
		$= \sqrt{15944.5 - 15787.93}$	½	
		$= \sqrt{156.5775} = 12.51$	½	5
18	a)	i) Sub divided (Component bar diagram	½	
		ii) 20	½	
		iii) 10	½	
		iv) Cricket	½	
	b)	Proper construction of histogram	4	6

Qn.No		Scoring Indicators	Split Score	Total Score
19	a)	i) geographical	1	
	b)			

Sex / Category	M	F	T
Students	50	30	80
Teachers	12	8	20
Total	62	38	100

4 | 5

20	a.	ii) Leptokurtic	1	
	b.	Mean = 21.5	1	
		Mode = 20	½	
		S.D = $\sqrt{\frac{\Sigma x^2}{n} - (\bar{x})^2}$ = 5.389	1½	
		Karl Pearsons Coeff. of Skewness } = $\frac{\text{Mean} - \text{Mode}}{SD}$	½	
		= .2783	½	5
21.	a.	$P(A) = .9 \quad P(B) = .7$	½	
		$P(A \cup B) = P(A) + P(B) - P(A \cap B)$	½	
		$= .9 + .7 - .9 \times .7$	½	
		$= .97$	½	
	b.	$P(E \cup F) = P(E) + P(F) - P(E \cap F)$	½	
		$P(E \cup F) = P(E) + P(F) - P(E)P(F)$		
		$.60 = .35 + P(F) - 0.35\,P(F)$	½	
		$.25 = P(F) - .35\,P(F)$	½	
		$P(F) = .25/.65 = 5/13$ //	½	4

Qn.No		Scoring Indicators	Split Score	Total Score
22.		A : Doctor arrives late A_1 : Doctor comes by train A_2 : Doctor comes by car A_3 : Doctor comes by bike $P(A_1) = 3/10 \quad P(A/A_1) = 1/4$ $P(A_2) = 5/10 \quad P(A/A_2) = 1/3$ $P(A_3) = 2/10 \quad P(A/A_3) = 1/12$	1	
		$P(A_2/A) = \frac{P(A_2).P(A/A_2)}{P(A_1)P(A/A_1)+P(A_2)P(A/A_2)+P(A_3).P(A/A_3)}$	1	
		$= \frac{5/10 \times 1/3}{3/10 \times 1/4 + 5/10 \times 1/3 + 2/10 \times 1/12}$ $= \frac{20}{31} = .6452$	2	4