Federal Board HSSC-II Examination
Model Question Paper Statistics

ROLL NUMBER					
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
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Version No.			
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SECTION - A (Marks 17)

Time Allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed.

Do not use lead pencil.

Candidate Sign._____ **Invigilator Sign. _____**

Q1. Fill the relevant bubble against each question. Each part carries one mark

Sr no.	Question	A	B	C	D	A	B	C	D
i.	An expected value of a random variable is equal to its.	Mean	Variance	Product	GM	○	○	○	○
ii.	An experiment of three coins tossed, has sample points.	9	6	8	12	○	○	○	○
iii.	The probability of drawing any one spade card from a pack of 52 cards is.	1/52	1/13	4/13	1/4	○	○	○	○
iv.	The probability associated with a confidence interval is	Level of significance	Level of confidence	Probability of success	None	○	○	○	○
v.	If expected frequencies are equal to observed frequencies, then attributes are	Associated	Positively associated	Negatively associated	Independent	○	○	○	○
vi.	If for a contingency table d.f =12 and no. of rows is 4 then no. of columns will be	5	4	3	2	○	○	○	○
vii.	$(\alpha\beta)$ is a frequency of the class with order:	0	1	2	None	○	○	○	○
viii.	T-test is used when sample size is	Small	Large	Sufficient	None	○	○	○	○
ix.	The event A and B are called mutually exclusive if:	$A \cup B = \varphi$	$AB = \varphi$	$A \cap B = S$	$A \cap B = \varphi$	○	○	○	○

x.	The maximum ordinate of normal distribution is_____:	$\frac{1}{\sigma\sqrt{2\pi}}$	$\frac{1}{\sqrt{2\pi}}$	Zero	1	O O O O
xi.	For positively skewed binomial distribution.	$p > \frac{1}{2}$	$p < \frac{1}{2}$	$p = \frac{1}{2}$	$p = 0$	O O O O
xii.	The mean of hypergeometric distribution is.	$\frac{nN}{k}$	$\frac{nk}{N}$	$\frac{n+k}{N}$	$\frac{Nk}{n}$	O O O O
xiii.	In……sampling, the population is divided into homogeneous subgroups	Simple random sampling	Cluster sampling	Stratified random sampling	Quota sampling	O O O O
xiv.	The probability of getting a sum 6 when a pair of dice is rolled once	1/36	6/36	5/36	7/36	O O O O
xv.	'A judge acquits a thief on benefit of double'. It is an example of:	Type-I error	Type-II error	Correct decision	None of these	O O O O
xvi.	Standard error is the standard deviation of	Frequency distribution	Probability distribution	Sampling distribution	None	O O O O
xvii.	A normally distributed population has known standard deviation of 1.0. The total width of a 95% confidence interval for the population mean is	1.96	3.92	1.645	Cannot be determined from the given information	O O O O

Federal Board HSSC-II Examination
Model Question Paper STATISTICS

Time allowed: 2.35 hours **Total Marks: 63**

Note: Answer all parts from Section "B" and all questions from Section "C" on the **E-sheet**.
Write your answers on the allotted/given spaces.

SECTION – B ($13 \times 3 = 39$ *Marks*)

Note: Attempt all parts.

Q.2	Question	M	Question	M
i.	Define association, positive association and negative association.	**OR**	A company has 8 directors. In how many ways can the following be selected: Chairman, MD, Executive Director Three members to form a sub-committee.	**3**
ii.	Describe the general procedure for testing of hypothesis.	**OR**	What is the difference between estimator and estimate?	**3**
iii.	If (A)=240, (B)=270, N=600. What would be the number of (AB) if A and B are independent?	**OR**	What is the difference between attributes and variables?	**3**
iv.	How many possible permutations can be performed from the word STATISTICS?	**OR**	. Define permutation and combination.	**3**
v.	A random sample of 100 observations is taken from a population. The sample is found to have a mean of 76 and standard deviation 12. Find 99% confidence interval for the mean of population.	**OR**	Differentiate between simple hypothesis and composite hypothesis.	**3**
vi.	What is the probability of getting a sum 11 when two dice are thrown?	**OR**	What is meant by statistical Inference?	**3**
vii.	If one card is selected randomly, find the probability of **(a)** a number card **(b)** a card of spades.	**OR**	Given E(X2) =300 and S.D(X) =9. Find E(X)	**3**
	In binomial distribution n=7, P=0.7. Find Co-efficient of variation	**OR**	Define Hypergeometric experiment.	**3**
	In binomial distribution mean=6, variance=4 find parameters of this distribution.	**OR**	Define random experiment and sure event.	**3**
	In a hypergeometric distribution N=10, n=5, k=4. Find its mean and variance.	**OR**	Define mathematical expectation. Also write down its properties.	**3**
	A continuous random variable X has pdf as follows: $f(x)=k(1+x)$ where $2 \leq x \leq 5$. Find the value of constant K.	**OR**	Differentiate between type-I and type-II error.	**3**
	In a normal distribution $Q_1=65$ and $Q_3=75$. Find its parameters.	**OR**	Write down any six properties of normal distribution.	**3**
	If X is a normal random variable with $\mu = 24$ and $\sigma = 4$ write down its probability density function. Find the maximum ordinate as well	**OR**	Differentiate between point estimate and interval estimate.	**3**

SECTION –C (4x6=24 Marks)

Note: Attempt all questions.

<table>
<tr><th>S.No</th><th>Question</th><th>OR</th><th>Question</th><th>M</th></tr>
<tr><td>Q-3</td><td>From the following table test the hypothesis that flower color is independent of flatness of leaf by calculating the chi-Square. Use α =0.05.
<table>
<tr><td rowspan="2">Flower color</td><td colspan="2">Leaves</td></tr>
<tr><td>Flat leaves</td><td>Lean leaves</td></tr>
<tr><td>White</td><td>99</td><td>36</td></tr>
<tr><td>Red</td><td>20</td><td>8</td></tr>
<tr><td>Yellow</td><td>12</td><td>27</td></tr>
</table></td><td>OR</td><td>In summer season, a dealer of desert room coolers can earn rupees 500 per day if the day is hot and rupees 200 per day if it is fair, loses rupees 60 per day if it is cloudy. Find his mathematical expectation if the probability of the day being hot is 0.80 and for being cloudy is 0.05.</td><td>6</td></tr>
<tr><td>Q-4</td><td>Show that:
$E(3x-2) = 3E(x) - 2 \ and$
$Var(3x-2) = 9Var(x)$
for the following probability distribution.
<table>
<tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>P(X)</td><td>1/8</td><td>1/8</td><td>4/8</td><td>2/8</td></tr>
</table></td><td>OR</td><td>Two fair dice are thrown.
Use addition law to find the probability of getting:
(i) A sum divisible by 4 or 6?
(ii) Product is even or greater than 20?</td><td>6</td></tr>
<tr><td>Q-5</td><td>A population consists of values 1, 3, 5, 7, 9. Draw all possible samples of size 2 without replacement and find mean of each sample. Make a sampling distribution of $\bar{X}$ and verify that:
(i) $\mu_{\bar{X}} = \mu$
(ii) $\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}}$</td><td>OR</td><td>The heights of male students of college are known to be normally distributed with a mean of 67.39 inches and σ = 1.30 inches. A random sample of 400 students showed a mean height of 67.47 inches. Using 0.05 level of significance, test the hypothesis H_p: μ = 67.39 against the alternative μ > 67.39</td><td>6</td></tr>
<tr><td>Q-6</td><td>A sample of 150 brand A light bulbs showed a mean life time of 1400 hours with a standard deviation of 120 hours. A sample of 200 brand B light bulbs showed a mean life time of 1200 hours and a standard deviation of 80 hours. Find (i) 95% and (ii) 99% confidence limits for the difference of the mean life times of the populations of brand A and B.</td><td>OR</td><td>In a normal distribution μ=47.6 and σ= 16.2. Find:
(i) The probability that a single observation will be larger than 60.
(ii) P_{10} and P_{60}</td><td>6</td></tr>
</table>