Question No.8:

The age of 1000 students studying in an Indian university is classified as follows:

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-22</td>
<td>500</td>
</tr>
<tr>
<td>22-24</td>
<td>250</td>
</tr>
<tr>
<td>24-30</td>
<td>150</td>
</tr>
<tr>
<td>30-35</td>
<td>72</td>
</tr>
<tr>
<td>35-40</td>
<td>25</td>
</tr>
<tr>
<td>40-45</td>
<td>3</td>
</tr>
</tbody>
</table>

We represent the above information using a Histogram. Let the heights of the rectangles representing the class intervals 17-22 and 35-40 be $h_1$ and $h_2$, respectively. Then, $h_1/h_2$ is

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15. The following table shows each family of a survey, classified according to both their family income and the level of happiness:

<table>
<thead>
<tr>
<th>Income</th>
<th>Level of Happiness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not too happy</td>
</tr>
<tr>
<td>Above average</td>
<td>36</td>
</tr>
<tr>
<td>Average</td>
<td>81</td>
</tr>
<tr>
<td>Below average</td>
<td>173</td>
</tr>
<tr>
<td>Total</td>
<td>290</td>
</tr>
</tbody>
</table>

Consider the following statements:

I. The percentage of the families who are having below average income and are very happy is 5.88%.

II. The percentage of the families having above average income who are not too happy is 10%.

The correct statement(s) is / are

ONLY-1

31. Let $X$ be a random variable such that $E|X| < \text{and}$

$$P \left( \frac{X}{5} < x \right) = P \left( \frac{X}{5} > 1 - x \right)$$

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32. Let the random variable $X$ has the probability density function

$$f_X(x) = \begin{cases} \frac{1}{x^2} & x > 1, \\ 0, & \text{otherwise}. \end{cases}$$

Then, the first (lower) quartile of the distribution is \text{DELETED (OUT OF SYLLABUS)}

33. Let the random variable $X$ has the probability density function

$$f_X(x) = \begin{cases} 2 & x > 1, \\ x^3, & \text{otherwise}. \end{cases}$$

Then, the first (from the lower side) decile of the distribution is \text{DELETED (OUT OF SYLLABUS)}

35. Let the random variable $X$ has the probability density function

\text{DELETED (OUT OF SYLLABUS)}

38. Let the random variable $X$ has the probability density function

\text{DELETED (OUT OF SYLLABUS)}

39. Let the random variable $X$ has the probability density function $f_X(x) =$ \text{DELETED (OUT OF SYLLABUS)}

40. Let the random variable $X$ has the probability density function

\text{DELETED (OUT OF SYLLABUS)}

43. Let the random variable $X$ has the cumulative distribution function

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47. One of the defining features of a smartphone is how long it can stay in standby mode on a single charge of the battery. Based on data from smartphones available from major cell phone carriers in the United States in 2014 (and relying on the fact that a manufacturer's claim of the standby time is accurate), the distribution of the standby time approximately follows a normal distribution with a mean of 330 minutes and a standard deviation of 80 minutes. What percentage of smartphones have a standby time below 230 minutes? (Given that $\Phi(1.25) = 0.8944$, where $\Phi(\_\_)$ is the cumulative distribution function of the standard normal variate.)

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50. Let $X_1$ and $X_2$ be two random variables with $\text{Var}(X_1) = 1; \text{Var}(X_2) = 2$ and $\text{Cov}(X_1;X_2) = 0.25$. Then, the variance of $X_1 + 2X_2$ is given by

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54. Let $X_1;X_2;X_3$ be a random sample from

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55. One of the patients in the ICU study had a high systolic blood pressure of 204 mmHg and a low pulse rate of 52 bpm. Which of these values is/are more unusual relative to the other patients in the sample? (The summary statistics for systolic blood pressure show a mean of 132 and standard deviation of 32, while the heart rates have a mean of 99 and standard deviation of 27. Assume that the distributions are normal for both the blood pressure and pulse rate.)

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56. Consider the three random variables $X$, $5X$ and $X=5$, where $X \sim \text{N}(5; 3)$. Let $v_1$, $v_2$ and $v_3$ be the coefficient of variation of these random variables, respectively. Which one of the following is correct?

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57. Let $v_i$ denotes the coefficient of variation of the distribution of $X_i$, where $X_i$

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58. Let the random variable $X$ has exponential distribution with mean 1. Then, the IQR of the distribution is

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67. Consider the random variable $X$ with $P(X = n) = \frac{1}{5}, n \in \{0, \pm 1, \pm 2\}$. Let $Y = X^2$. Now, consider the following statements:

I. $X$ and $Y$ are independent.
II. $X$ and $Y$ are uncorrelated.

Which of the above statements is/are correct?

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68. Let $X_1;X_2;X_3$ be a random sample from $\text{N}(0, \sigma^2)$, where $\sigma$ is a known constant. Then, the correlation coefficient between $X_1 + X_2$ and $X_2 + X_3$ is

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78. Consider a random variable $X$ with the probability density function

**DELETED (OUT OF SYLLABUS)**
80. Let $Z_1$ and $Z_2$ be two independent $N(0; 1)$ random variables. Define $X = Z_1$ and $Y$

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135. FRBMA 2003 emphasizes on the following except one. Identify that one?

   Both improve competitiveness of domestic goods and services in the globalized economic environment and capital – Led Fiscal consolidation

139. In the year 2011-12, out of 1000 people, in the population 395 persons were in the labor force according to Usual Status. Persons unemployed are 9. Find out the work force participation rate?

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