B. TECH.

(SEM. IV) EXAMINATION, 2006-07

STATISTICS & TEXTILE TESTING - I

Time : 3 Hours
[Total Marks : 100]

Note : Attempt all questions. All questions carry equal marks.

1. Attempt any four parts of the following:

(a) What do you mean by ‘standard deviation’ and ‘co-efficient of variation’ of a set of data?

(b) If \( \bar{X} \) and \( \sigma \) be the average value and standard deviation respectively. How much per cent of data will fall between:

(i) \( \bar{X} \pm \sigma \)

(ii) \( \bar{X} \pm 2\sigma \)

(iii) \( \bar{X} \pm 3\sigma \) ?

(c) How can you find out standard deviation of a sample by Range method?

(d) From the following wage distribution, calculate the standard deviation of wage of workers of the textile mill:

V–6015] 1 [Contd...
<table>
<thead>
<tr>
<th>Wages (Rs)</th>
<th>No. of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50</td>
<td>07</td>
</tr>
<tr>
<td>51-100</td>
<td>12</td>
</tr>
<tr>
<td>101-200</td>
<td>33</td>
</tr>
<tr>
<td>201-350</td>
<td>16</td>
</tr>
<tr>
<td>201-500</td>
<td>24</td>
</tr>
</tbody>
</table>

(e) Compare range, mean deviation, quartile deviation and standard deviation as measures of dispersion.

(f) Find the arithmetic mean and the median of the following distribution:

<table>
<thead>
<tr>
<th>Weekly wages (Rs) :</th>
<th>1-15</th>
<th>16-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-65</th>
<th>66-80</th>
<th>81-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>09</td>
<td>62</td>
<td>135</td>
<td>88</td>
<td>62</td>
<td>19</td>
<td>05</td>
</tr>
</tbody>
</table>

2 Attempt any four parts of the following:

(a) What are rational subgrouping? Explain the principles of forming rational subgroups.

(b) Why is it necessary to maintain both $\bar{X}$ and R charts? Write the control limits for $\bar{X}$ and R charts assuming the standard value for process mean (m) and process S.D. ($\sigma$) to be known and unknown.

(c) How population standard deviation is estimated from sample range? What is meant by standard error? How stand error differs from standard deviation.

(d) If the average rate of end breaks in a ring spinning frame (worsted) is 16, what is the maximum permissible limit of the end breaks and so as to indicate the process to be under control.

(e) What are the indications on $\bar{X}$-chart which will lead us to conclude that the process is not in a state of control?

V-6015] 2 [Contd..
(f) Distinguish between the terms ‘defects’ and ‘defectives’. Under what situations a C-chart is used?

3 Answer any **two** parts of the following:
(a) Describe any standard method for determination of crimp of wool fibres.
(b) Discuss about the technical significance of determination of span length and bersorter diagram analysis.
(c) How medullation % of wool fibres are measured in the laboratory?

4 Attempt any **two** parts from the following:
(a) Explain clearly the procedure of identification of fibres in blends of polyester/wool by blend analysis method.
(b) Define fibre fineness. What is its importance in spinning? How wool fibre fineness is determined? and what is its unit?
(c) What do you mean by the term moisture regain? Explain the process of determination of grease/fats from wool fibres.

5 Attempt any **two** parts of the following:
(a) Compare between single fibre and bundle strength testing.
(b) Describe the main elements in any H.V.I. in testing.
(c) What are the importance of stress-strain curves?