	<b>Title: Supply, Installation, Commissioning and Final Acceptance Testing of 2 units of High Resolution Spectrometer System with Accessories PART-A(II)</b>	Global Tender Notice No. I-ITN19006 dated 11.10.2019
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## **Appendix-2**

### **PERFORMANCE CRITERIA FOR THE ACCEPTANCE OF THE SPECTROGRAPH WITH CCD DETECTOR**

**All the acceptance tests are to be demonstrated using 1800l/mm (Grating#1), 1200l/mm (Grating# 2) and 600 l/mm( Grating# 3).**

#### **1) Test for the imaging performance**

At the entrance of the spectrograph	Fiber array coupled and aligned using imaging fiber adapter.
Light sources	1) Integrating sphere and a Quartz Tungsten lamp 2) Low pressure spectral calibration lamp
Spectrograph Settings	Configuration 1: Slit width : As same as pixel size of CCD Slit height : As same as height of CCD
Test procedure	Configuration 1 :  a) Scan few spectra in the range 500-800nm using light source.1 b) Record few standard lines using light source.2.
Configuration	Required test result
Configuration 1	a) A dispersed spectrum consisting of distinct, spatially well resolved and uniformly illuminated tracks with the track to track separation remaining nearly same across the focal plane of the CCD.  b) Image distortion across the focal plane should be less than 22%.  c) When only one track is illuminated, the intensity reading in the other track should show counts corresponding to the background counts of CCD. The test has to be repeated by illuminating all the tracks one by one to check consistency across the image plane.


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## 2) Test for average wavelength coverage and average wavelength dispersion

At the entrance of the spectrograph	Fiber array coupled and aligned using imaging fiber adapter.
Light source	Low pressure Mercury lamp/Argon lamp/Neon lamp
Spectrograph Settings	Slit width : Same as pixel size of CCD Slit height : As same as height of CCD
Test procedure	Scan nearby wavelengths: $\lambda_1$ and $\lambda_2$ Dispersion = $(\lambda_2 - \lambda_1) / W$ Where, W= No of pixels covered* pixel width ( mm)
	Required test result
Wavelength dispersion	1.0 to 0.8 nm/mm for Grating no.1 1.5 to 1.3 nm/mm for Grating no .2 3.5 to 2.8 nm/mm for Grating no.3
Wavelength coverage	13-10 nm for Grating no.1 20-17 nm for Grating no.2 45-35nm for Grating no.3

## 3) Test for wavelength resolution

At the entrance of the spectrograph	Fiber array coupled and aligned using imaging fiber adapter.
Light source	Low pressure Mercury lamp/Argon lamp/Neon lamp
Spectrograph Settings	Slit width : As same as pixel size of CCD Slit height : As same as height of CCD
Test procedure	
Spectral lines	Few standard emissions lines in 300-800 nm for 1800 l/mm and lines in 300-1000 nm range for 1200 l/mm and 600 l/mm.

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	Required test result
Wavelength Resolution	<p>For all the recordings <i>i.e. center, right and left edges of CCD</i></p> <p><math>\leq 0.06\text{nm}</math> across the focal plane for Grating no.1</p> <p><math>\leq 0.08\text{nm}</math> across the focal plane for Grating no.2</p> <p><math>\leq 0.15 \text{ nm}</math> across the focal plane for Grating no.3</p>