

## P38/HSC242/EE/20160519

**Time : 3 Hours**

**Marks : 80**

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**Instruction :**

1. All Questions are Compulsory.
  2. Each Sub-question carry 5 marks.
  3. Each Sub-question should be answered between 75 to 100 words. Write every questions answer on separate page.
  4. Question paper of 80 Marks, it will be converted in to your programme structure marks.
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1. Solve any **four** sub-questions.
  - a) Define bathochromic shift, hypsochromic shift, hyperchromic shift and hypochromic shift. Give at least one example of each term. 5
  - b) Write a short notes on radiation sources used in IR spectroscopy. 5
  - c) Define chemical shift. Explain in detail various factors affecting chemical shift. 5
  - d) Enlist various detector used in HPLC. Explain in detail UV detector. 5
  - e) Write a short note on application of mass spectrometry. 5
2. Solve any **four** sub-questions.
  - a) Draw a neat well labelled diagram of double beam UV visible spectrometry. Explain the function of each part in short. 5
  - b) Enlist of various modes of vibration. Explain in details bending vibrations. 5
  - c) Explain in brief spin-spin coupling. 5
  - d) Explain the principle of column chromatography. Give its application. 5
  - e) Enlist of various detectors used in IR spectroscopy. Explain in brief thermocouples detector. 5

