

Time : 3 Hrs.

Note :

1. Part 'A' may be attempted in first 5 pages of Answer Sheet.
भाग 'क' के सभी उत्तर, उत्तर-पुस्तिका के प्रथम पांच पृष्ठों में ही करने हैं।
2. Part 'B' in rest of the Sheets of Answer Sheet.
भाग 'ख' के उत्तर, उत्तर-पुस्तिका के अगले शेष पृष्ठों में लिखिये।
3. Answers may be given in English or Hindi.
प्रश्नों के उत्तर अंग्रेजी अथवा हिन्दी में दीजिये।

Part 'A'

10x1= 20

1. Attempt any 10 questions:

- (i) NMR and ESR stand for.
- (ii) What is replication?
- (iii) Write advantages of x-rays.
- (iv) What is absorption and emission process?
- (v) What is single beam and double beam?
- (vi) How do you define grating?
- (vii) Compare grating and prism.
- (viii) What is dispersive power?
- (ix) Define hygrometer.
- (x) What is gas chromatography?
- (xi) Distinguish between plane and concave.
- (xii) Explain echelon transmission grating.

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2. Attempt any 5 questions:

5 x 4= 20

- (i) Give a brief description of spectrophotometer with neat block diagram.
- (ii) Explain the laws relating to absorption of radiation.
- (iii) Write short note on echelon transmission grating and resolving power of grating.
- (iv) How the density of gas is measured. Explain in brief.
- (v) Derive Bragg's equation for x-ray diffraction from crystal.

- (vi) Explain the fundamental laws of photometry.
- (vii) Explain the basic principle of gas chromatography & enlist the types of gas chromatography.
- (viii) Explain the pH measurement and its applications.

PART-B

3 X 10 = 60

Attempt any 3 questions:

- 3 (a) Explain principle and working of NMR spectrometry. Also explain its applications.
(b) What is the pH value of neutral water? Mention some uses of pH value.
- 4 (a) What is nuclear instrumentation? Explain proportional counter, liquid scintillation counter.
(b) Write short note on:
(i) Visual Comparators
(ii) Source of radiant energy, detectors and indicators.
- 5 (a) Write short note on application of spectrometry.
(b) Explain single beam and double beam densitometer with neat diagram.
- 6 (a) Explain differential pressure capillary tube in detail.
(b) Write short notes on:
(i) Gas analysers
(ii) Wage filter

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