

Roll No :

Total No. of Questions : 11]

[Total No. of Printed Pages : 3

SP-710

M.Sc. (Final) Examination, 2021

PHYSICS

Paper - VII (A)

(Electronics, Digital Electronics and
Communication Electronics)

Time : 1½ Hours]

[Maximum Marks : 75

Section-A

(Marks : 2 × 10 = 20)

Note :- Answer all *ten* questions (Answer limit 50 words). Each question carries 2 marks.

(खण्ड-अ)

(अंक : 2 × 10 = 20)

नोट :- सभी दस प्रश्नों के उत्तर दीजिए (उत्तर-सीमा 50 शब्द)। प्रत्येक प्रश्न 2 अंक का है।

Section-B

(Marks : 5 × 5 = 25)

Note :- Answer all *five* questions. Each question has internal choice (Answer limit 200 words). Each question carries 5 marks.

(खण्ड-ब)

(अंक : 5 × 5 = 25)

नोट :- सभी पाँच प्रश्नों के उत्तर दीजिए। प्रत्येक प्रश्न में विकल्प का चयन कीजिए (उत्तर-सीमा 200 शब्द)। प्रत्येक प्रश्न 5 अंक का है।

Section-C

(Marks : 10 × 3 = 30)

Note :- Answer any *three* questions out of five (Answer limit 500 words). Each question carries 10 marks.

(खण्ड-स)

(अंक : 10 × 3 = 30)

नोट :- पाँच में से किन्हीं तीन प्रश्नों के उत्तर दीजिए (उत्तर-सीमा 500 शब्द)। प्रत्येक प्रश्न 10 अंक का है।

BI-347

(1)

SP-710 P.T.O.

Section–A

2 each

1. (i) Draw a block diagram of typical op-amp.
- (ii) Define a differential amplifier.
- (iii) What is meant by input offset current ?
- (iv) What is a Voltage regulator ?
- (v) Define a Comparator.
- (vi) Draw diagram of *two* cavity Klystron.
- (vii) Name various modes of operation of a Gunn diode.
- (viii) Give *two* disadvantages of microwave transmission.
- (ix) What is signal to noise ratio ?
- (x) What is a Geostationary Satellite ?

Section–B

5 each

2. Give DC analysis of a differential amplifier and obtain suitable parameters.

Or

Describe the effect of feedback on closed loop gain in voltage series feedback amplifier.

3. Giving circuit diagram describe how op-amp behave as an integrator.

Or

Give *three* differences between a fixed regulator, adjustable regulators and switching regulator.

4. Describe how square wave generator can be made using an op-amp. Give the suitable circuit diagram and explain its working.

Or

Discuss the principle and working of Reflex Klystron.

5. Explain a Read diode with diagram in detail.

Or

How are antennas useful in microwave communication ? Give necessary details.

6. Obtain Radar ranger equation.

Or

Define the terms :

- (i) Look angles
- (ii) Orbital spacing
- (iii) Link modules
- (iv) Orbital patterns

Section–C

10 each

- 7. Give an AC equivalent circuit for a differential amplifier. Why is AC analysis done ? Obtain voltage gain, input resistance and output resistance for open loop configuration of dual input balanced output differential amplifier.
- 8. Discuss the role of closed loop in an op-amp. Giving necessary circuit diagram and derivation show how op-amp acts as a summing, scaling and averaging amplifier.
- 9. What are RC oscillators ? Discuss in detail Weinbridge oscillator with suitable circuit diagram. Obtain expression for frequency.
- 10. Give the constructional working of Helix travelling wave tube.
- 11. Discuss in brief :
 - (a) Orbital satellites
 - (b) Pulse repetition frequency
 - (c) System and propagation losses