

V.P. & R.P.T.P. SCIENCE COLLEGE
VALLABH VIDYANAGAR

First Semester Internal Examination

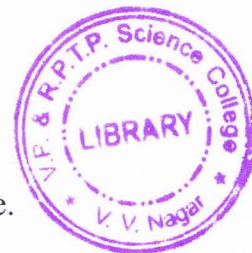
Subject: Physics

Course: US01CPHY02

Date: 05-10-2013 Saturday

Time: 11:00 to 12:00 pm

Total Marks: 30



Q.1 Answer the following questions with the correct choice. (Each of 1 Mark.) (6)

- (1) The point of a network where three or more circuit elements are connected is a point.
(a) junction (b) node (c) branch (d) mesh.
- (2) Which of these is a closed path of a network?
(a) junction (b) mesh (c) branch (d) node.
- (3) Which of these is a dc bridge?
(a) Kelvin bridge (b) Maxwell bridge (c) Hay bridge (d) Wein bridge.
- (4) Which bridge is used to determine the frequency of an ac source?
(a) Wien bridge (b) Maxwell bridge (c) Hay bridge (d) Schering bridge
- (5) The resolving power of the prism of thickness t with refractive index μ depends
(a) only on thickness t (b) on refractive index μ (c) $d\mu/dt$ (d) none of these
- (6) For a transmission grating, with increase in spectrum order (n), the resolving power
(a) increases (b) decreases (c) becomes zero (d) remains unchanged

Q.2 Answer any three. (Each of 2 Mark.) (6)

- (1) Using a proper network diagram explains the terms: (i) node (ii) Branch.
- (2) Three resistors of $10\ \Omega$, $20\ \Omega$ and $30\ \Omega$ are connected in series with a battery of 6 V . Draw this network and find voltage across the resistor of $20\ \Omega$.
- (3) Draw the circuit of ac bridge and state expressions for its balancing conditions.
- (4) Draw the circuit of a Wien Bridge and name its components. State its uses.
- (5) Define resolving power and state Rayleigh's criterion for just resolved images.
- (6) There are 45,000 lines ruled on a plane transmission grating. Determine its resolving power in the second order ($n=2$) for a wavelength of $6000\ \text{\AA}$.

Q.3 Define mesh and mesh current. With a suitable example explain mesh current method for analysis of a two mesh network. (6)

OR

Q.3 Give the statement of Thevenin theorem and using necessary diagram explain it with a proper example. (6)

Q.4 State application of a Hay bridge. With necessary diagram explain its working and measurements. Explain importance of a Hay Bridge. (6)

OR

Q.4 What is a Schering Bridge? With necessary diagram explain its working and discuss its parameters. (6)

Q.5 Explain principle, construction and working of a Michelson interferometer. Discuss types of fringes obtained using it. (6)

OR

Q.5 What are interferometers? Explain construction and working of a Jamin's interferometer. Discuss Jamin's compensator plate. State applications of Jamin's interferometer. (6)