V.P. & R.P.T.P. SCIENCE COLLEGE
VALLABH VIDYANAGAR
First Semester Internal Examination

Subject: **Physics** Course: **USO1CPHY02**
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) dμ/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 Ω, 20 Ω and 30 Ω are connected in series with a battery of 6 V. Draw this network and find voltage across the resistor of 20 Ω.
(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 Raylaigh'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 Å.

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)**

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