King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE-407; Lab final Exam

Answer **all THE** question. All questions carry **equal** marks.

Name: ***I.D.***

1. Using the given components, set up the equipment and measure the insertion loss of the microstrip line.

   (a) Show the setup to your instructor before you switch the power ON

   OK Partially OK Not OK

   (b) Measure the insertion loss in dB for the frequency of 3 GHz.

   Insertion Loss (in dB) = _____

2. Terminate the above microstrip line with an unknown load and measure values needed to calculate the VSWR.

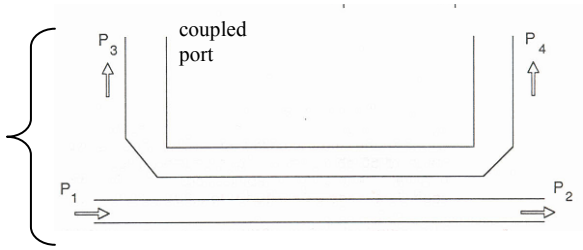
   (a) Show the setup to your instructor before you switch the power ON

   OK Partially OK Not OK

   (b) VSWR = _____

3. (a) Write the **equations** used to find the coupling coefficient (in dB) and isolation (in dB) of the directional coupler shown in figure below.

(b) If this is a -10dB directional coupler and the incident power is 1mW, find the coupled power.

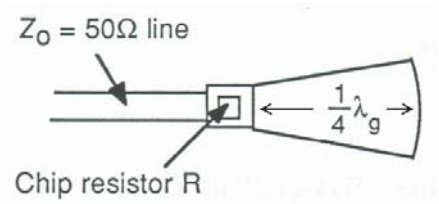


4. (a) Design a Wilkinson power divider, which will be connected to a source with a internal resistance of 150 Ω and will be terminated by two loads of 150 Ω each.

(b) Briefly write one major difference between the hybrid-ring coupler and Wilkinson power divider?

5. (a) **Draw** any circuit,
with dimensions, that is used
to provide DC bias to the
microwave amplifier.
Briefly say how does it work?

(b) Draw the **schematic diagram** of the following structure with unknown load (R)



(c) Use the figures to **find** the input impedances of Z_1, Z_2, Z_3 and Z_4

Z_2= _____