

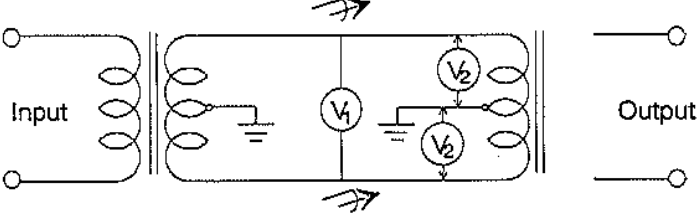
**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, April/May 2018**

**Course:** Electromagnetic Field Theory and Compatibility  
**Semester:** VI  
**Program:** B.Tech ICE  
**Time:** 03 hrs.

**Max. Marks: 100**

**Instructions: All Diagrams should be sketched by Pencil**

**SECTION A**

S. No.		Marks	CO
1.	Explain the phenomenon of Electro Static Discharge with equivalent circuit.	5	CO1
2.	Differentiate the characteristics among EFT Surge and ESD	5	CO3
3.	Express the common mode and differential mode interference. 	5	CO4
4.	Describe the prominence of Back filter employed in the Surge Test Set up.	5	CO5

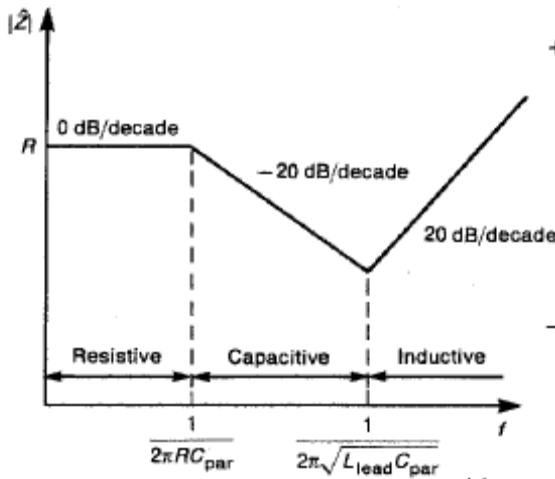
**SECTION B**

5.	Elucidate the practical concerns of the EMI.	10	CO1
6.	Calculate the array resistance of a square array of vertical rods buried in the ground with 16 rods, each 100m long and 2cm and with the resistance of the single electrode rod with resistivity $10^2 \Omega \text{ cm}$ .	10	CO2
7.	Designate the guidelines for component placement in PCBs keeping in view the EMI/EMC considerations	10	CO3
8.	Design the setup, which measures Desktop performance when it is exposed by the radiation intensity levels of 3.5dB Electric field intensity on it. With the help of neat sketch, explain the procedure to measure the performance levels.  <p style="text-align: center;">(or)</p> What are reflective filters? Draw any two reflective filters for T-section used for filtering EMI. Explain De-coupling in the Filter circuits.	10	CO4

**SECTION-C**

9.	(a) Design a set up for the Electrostatic Discharge conducted EMI in which elaborate the circuit which is used to give the ESD pulses to test the performance levels.[12] (b) Which non-ideal component has the response shown in the below figure and	20	CO2
----	---	----	-----

derive the circuit for the equivalent parasitic components.[8]



10. (a) Is LISN required for the design of Experimental setup for conducted EMI. Design set up with the following requirements (i) interconnecting cables 40cm (ii) Terminating impedance 50Ω. [14]

(b) Design an anechoic Chamber which test the mobile handset antenna for the radiation emission 15.7DB.[6]

(OR)

c) Determine the insertion loss for a circuit which has output voltage 39 V without filter and has output voltage 29 after filter is connected[8].

d) Determine the ratio of (a) two powers  $P_1=25mW$  and  $P_2=2W$  (b) two voltages  $v_1=10mV$  and  $v_2=15\mu V$  in dB. [6]

e) Determine the intrinsic impedance of the material which is used for shielding the CPU, when EMwave is incident normally at 20MHz frequency and with the absolute permeability and conductivity of 10mhos/cm.[6]

CO5