Ministry of Higher Education		
Higher Institute for Engineering and Technology at El-Manzala		
First semester : 2022/2023		Level: 1
Department: Electronic Engineering.		
Sheet No. (3)		Code: COM113
Course title: Fundamental of electronics	Examiner: Dr. Mohamed Abdel Rahman	

Answer all of the Following Questions

Question (1):

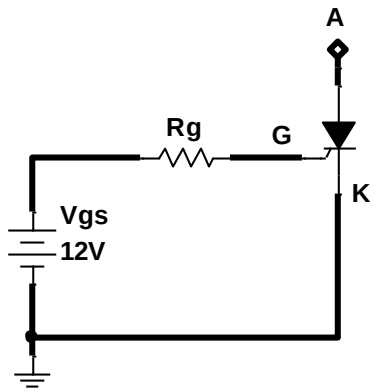
Compare zener and avalanche breakdown voltages.

No.	Parameters	Zener breakdown	Avalanche breakdown
1	Doping		
2	Depletion region		
3	Reverse voltage		

Question (2):

An SCR has $V_g - I_g$ characteristics given as $V_g = 1.5 + 8I_g$. In a certain application the gate voltage consists of rectangular pulses of 12 V and duration 50 μs with duty cycle 0.2 . Find

1) Rg in gate circuit to limit the peak power dissipation in gate to 5Watt.
2) Average power dissipation in gate.



Question (3):

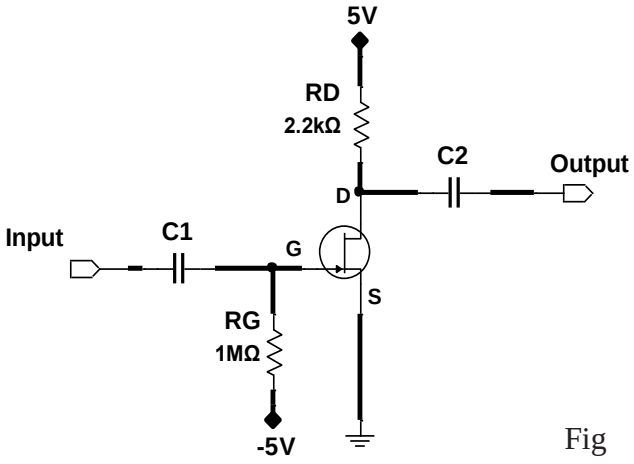
1) Compare the following parameters for the BJT and JFET devices.

No.	Parameters	JFET	BJT
1	Control element		
2	Device type		
3	Types of carriers		
4	Input resistance		
5	Thermal noise		
٦	Schematic symbol		

2)Tabulate the following parameters for the JFET and BJT devices.

No.	Parameters	JFET	BJT
1	Abbreviation represents….		
2	Modes of operations		
3	Thermal noise		
4	Susceptible to damage		
5	Input impedance		
6	Schematic symbol		

3) A JFET shown in Fig. 3 has values of VGS (off) = – 8V and IDSS = 16 mA. Determine the values of VGS, ID and VDS. (5 marks)



Fig

4)Draw and explain one of the applications for the silicon controlled rectifier (SCR).

5) Aided with the configurations, draw the structure of n and p channels for both JFET and MOSFET devices. Also discuss and explain the physical operation for each one of them.

6) Aided with the configurations, draw the structure of n and p channels for both JFET and MOSFET devices. Also discuss and explain the physical operation for each one of them.

7) Draw and explain one of the applications for the silicon-controlled rectifier (SCR).