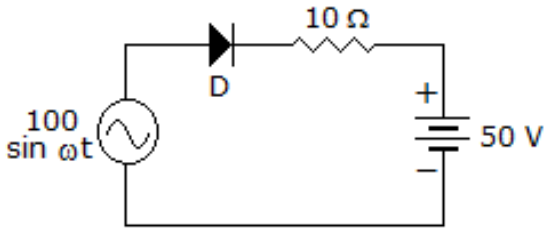
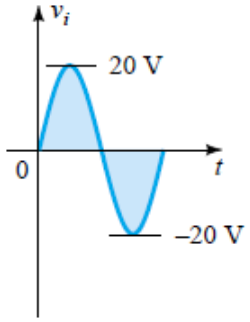
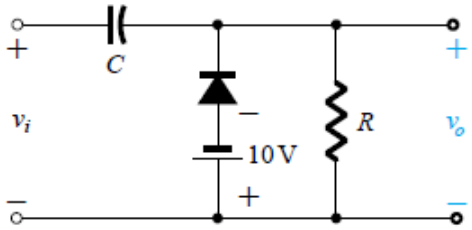
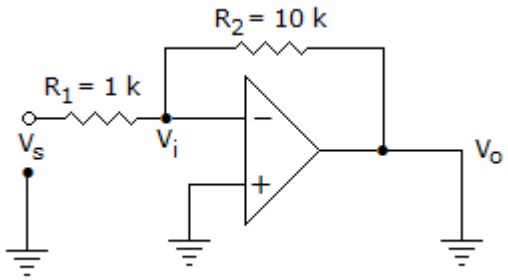
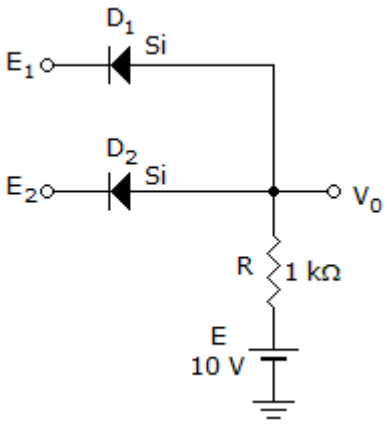
Name: **Enrolment No:**	UPES

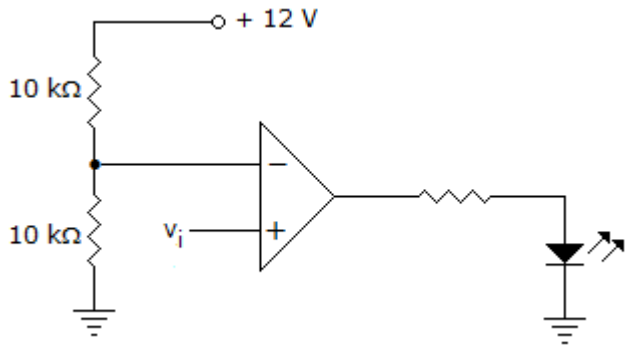
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Analog Electronics (ECEG 2027) **Semester: III**
Program: B. Tech ELE
Time: 03 hrs. **Max. Marks: 100**
Instructions: **Attempt all questions.**
Diagrams must be neat and clean

SECTION A

S. No.		Marks	CO
Q 1	Discuss the action of an **operational amplifier** as an **integrator**.	**5**	**CO3**
Q 2	Describe the action of a **transistor** as an **amplifier**. What will happen to its action, if the **doping** concentration of **collector is same as emitter**?	**5**	**CO2**
Q 3	 In the circuit of figure the diode, find the **condition** when the **diode will operate**.	**5**	**CO1**
Q 4	What best describe the **circuit** given below. Draw the **output waveform**, the input waveform is given below. What will be happen to the output if the **polarity** of the **diode is reversed**?  	**5**	**CO1**

	SECTION B		
Q 5	Describe the working of a **JFET transistor**, with schematic representation of distribution of V_{DS} of 8 V and V_{GG} of -1V. What will happen to channel distribution when V_{GG} becomes +1 V.	**10**	**CO2**
Q 6	Analyze the **op-amp circuit** shown in the figure has an open loop gain to 100. Calculate the **closed loop ratio** (V_O/ V_S). 	**10**	**CO4**
Q 7	Determine the **current** through each diode if (i) $E_1 = E_2 = 0$ V, (ii) (ii) $E_1 = E_2 = 5$ V. 	**10**	**CO1**

Q 8	In the circuit given below, calculate the value of Vi for the LED to be on.  		**CO4**
SECTION-C			
Q 9	Design an **AC connection of differential amplifier circuit** and determine the single ended output voltage of the circuit with the following specification V_{CC} = 9 V, R_C = 69 kΩ, R_E = 61 kΩ, Vin = 2 mV. **OR** Design a **three stage amplifier**, using operational amplifier, providing outputs that are 10, 20 and 40 times larger than the input. The feedback resistor for all the three circuits are 540 kΩ.	**20**	**CO4**
Q 10	Design a **Band Pass Filter** circuit using **two** operational amplifier. Also determine the cut off frequencies of the filter with the following specifications: R1 = R2 = 10 kΩ, C1 = 0.1 μF, C2 = 0.002 μF. Draw the **BODE** plot for the lower cut off frequency.	**20**	**CO3**