Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

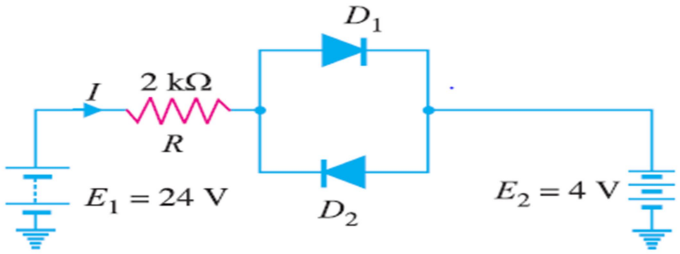
Course: Basic Electrical and Electronics Engineering — **Semester: II**
Program: B.Tech BioTech and B.Tech FoodTech — **Time : 03 hrs.**
Course Code: ECEG- 1004 — **Max. Marks: 100**

Instructions:

Q.No	Section A Short answer questions/ MCQ/T&F	(20Q x1.5M= 30 Marks)	COs
Q	Statement of question	1.5	CO1
1.	The reverse current in a diode is of the order of …… (a) kA, (b) mA, (c) A, (d) µA	1.5	CO1
2.	A Zener diode is used as: (a) Amplifier, (b) Rectifier, (c) Voltage Regulator (d) multivibrator	1.5	CO1
3.	A NAND gate is called a universal logic element because (b) everybody uses it (c) any logic function can be realized by NAND gates alone (d) all the minimization techniques are applicable for optimum NAND gate realization (e) many digital computers use NAND gates.	1.5	CO1
4.	The NOR gate is OR gate followed by…… (a) AND gate (b) NAND gate (c) NOT gate (d) None of the above	1.5	CO1
5.	The collector of a transistor is ……doped (a) Heavily (b) moderately (c) lightly (d) None of the above	1.5	CO1
6.	At the base-emitter junctions of a transistor, one finds …… (a) reverse bias (b) a wide depletion layer (c) low resistance (d) none of the above	1.5	CO1
7.	Most of the majority carriers from the emitter …….. (a) recombine in the base (b) recombine in the emitter (c) pass through the base region to the collector (d) None of the above	1.5	CO1
8.	A crystal diode is a …… device (a) non-linear (b) bilateral (c) linear (d) None of the above	1.5	CO1

9.	Thevenin resistance Rth is found (a) by removing voltage sources along with their internal resistances (b) by short-circuiting the given two terminals (c) between any two 'open' terminals (d) between same open terminals as for V_{th}	1.5	CO1
10.	The circuit whose properties are the same in either direction is known as (a) unilateral circuit (b) bilateral circuit (c) irreversible circuit (d) reversible circuit	1.5	CO1
11.	An ideal voltage source has (a) zero internal resistance (b) open circuit voltage equal to the voltage on full load (c) terminal voltage in proportion to current (d) terminal voltage in proportion to the load	1.5	CO3
12.	For faithful amplification by a transistor circuit, the value of V_{BE} should ……. for a silicon transistor (a) Zero (b) 0.01 V (c) Not fall below 0.7 V (d) between 0 V and 0.1 V	1.5	CO3
13.	The circuit that provides the best stabilization of the operating point is …… (a) Base resistor bias (b) Collector feedback bias (c) Potential divider bias (d) None of the above	1.5	CO3
14.	The operating point is also called the……. (a) Cut off point (b) Quiescent point (c) Saturation point (d) None of the above	1.5	CO3
15.	The value of the alpha (α) transistor is ……. (a) more than 1 (b) less than 1 (c) 1 (d) none of the above	1.5	CO3
16.	The only function of NOT gate is to…….. (a) Stop signal (b) Invert input signal (c) Act as a universal gated.	1.5	CO3

	(d) None of the above		
17.	In which of the following base systems is 123not a valid number? (a) Base 10 (b) Base 16 (c) Base8 (d) Base 3	1.5	CO3
18.	A passive network contains (a) only variable resistances (b) only some sources of e.m.f. in it (c) only two sources of e.m.f. in it (d) no source of e.m.f. in it	1.5	CO3
19.	A closed path made by several branches of the network is known as (a) Branch (b) Loop (c) Circuit (d) Junction	1.5	CO3
20.	If the arrow of the crystal diode symbol is positive w.r.t. bar, then the diode is ……..biased. (a) Forward (b) Reverse (c) Either forward or reverse (d) None of the above	1.5	CO3
	Section B	**(4Qx5M=20 Marks)**	CO
Q	Statement of question		
1.	What is meant by the term universal gate? Which gates are considered universal gates? Explain with the help of an example.	5	CO2
2.	Enumerate the characteristics of a crystal diode. Does a crystal diode obey ohm's law?	5	CO2
3.	Explain the significance of amplification. Which electronic devices are commonly used as amplifiers?	5	CO4
4.	State Thevenin's and Norton's theorem.	5	CO2
	Section C	**(2Qx15M=30 Marks)**	
Q	Statement of question (Case studies)		CO
1.	Sketch a neat labeled diagram of an NPN transistor in a common emitter configuration and draw its input and output characteristics.	15	CO2

	Also, define various operating regions for CE configuration.		
2.	Write a short note on the following: (a) Switch fuse unit (b) MCB (c) ELCB	15	CO3
	Section D	**(2Qx10M=20 Marks)**	
Q	Statement of question		
1.	Convert the following numbers into the corresponding number system (2.5 marks each) A. $(40)_{10} = (?)_{16}$ B. $(000111101100)_2 = (?)_{16}$ C. $(152)_8 = (?)_2$ D. $(C4)_{16} = (?)_2$	10	CO4
2.	Determine the current I in the circuit shown below. Assume the diodes to be silicon and the forward resistance of the diodes to be zero. 	10	CO4