Name: **Enrolment No:**	

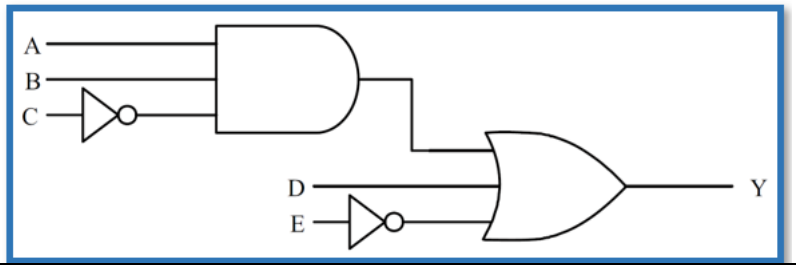
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Industrial Electrical Utility System — **Semester:** 7th
Program: B Tech (Electrical Engineering) — **Time** : 03 hrs.
Course Code: EPEG 4012 — **Max. Marks:** 100
Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	What are the various application of PLC ?	**4**	**CO4**
Q 2	Draw the symbol for the following component/equipment. • Current transformer • Fuse • DPDT switch Isolator	**4**	**CO1**
Q 3	Give the environmental benefits of digital substation.	**4**	**CO2**
Q 4	How poor power factor can lead stress on generating station?	**4**	**CO1**
Q 5	Why earthing is required and how it can protect?	**4**	**CO2**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Discuss inverse square law & cosine law of Illumination.	**10**	**CO3**
Q 7	Design the ladder diagram for the below figure. Also define the output and write the Boolean expression. 	**10**	**CO4**
Q 8	Sketch the MCB internal circuit and differentiate the functioning of coil and strip placed in MCB.	**10**	**CO3**

Q 9	Present the operating principle of RCCB and its practical applications.	**10**	**CO2**
SECTION-C (2Qx20M=40 Marks)			
Q 10	Design the cable sizing considering the following constraints. (a) Supply type (single phase/3-phase/DC) (b) Full load current in Ampere (c) Full load power factor (d) Cable conductor material (Copper/Aluminium) (e) Derating factor (f) Maximum permissible voltage drop	**20**	**CO3**
Q 11	Present the main concepts which are necessary for the development and realization of the automation system as per IEC 61850. OR Discuss how Open Systems Interconnection (OSI) model maintains the framework for inter-device data communications.	**20**	**CO4**