

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES	
End Semester Examination, May 2021	
Course: Electrical System Safety and Its Design	Semester: IV
Program: B. Tech-FSE	Time : 3 hrs.
Course Code: HSFS 2006	Max. Marks: 100

SECTION A			
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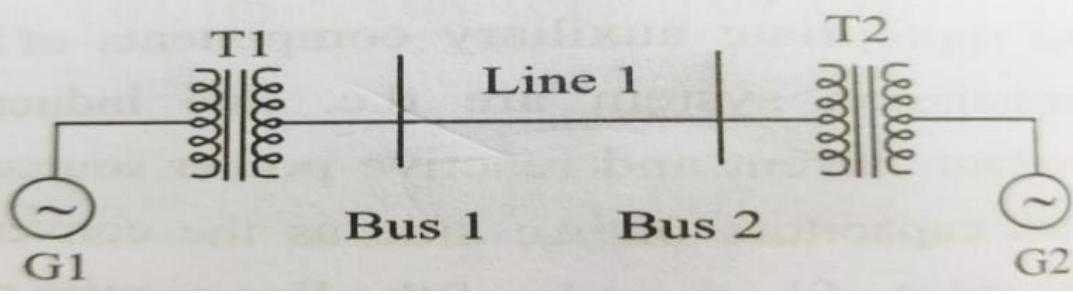
S. No.	Answer all the questions	30 Marks	Mapped CO
Q 1	Expand the following: a. CPR b. LAB c. RCCB d. HRG e. NESC (USA)	5	CO1
Q 2	Justify the statement: “Shock severity varies with magnitude of current”.	5	CO1
Q 3	Define the following: a. LCPD b. OCPD c. AFCI d. CLF e. Fuse Factor	5	CO2
Q 4	List various types of ESDs along with their ability to ignite gases/liquids/solids.	5	CO3
Q 5	List categories of PPEs to be provided for workers in arc flash prone areas as per NFPA.	5	CO4
Q 6	Answer the following: a. MESH is _____(Expansion) b. Area classification has been done as per physical state of material in NEC [T/F] c. IEC standard for HAC is _____ (standard no.) has been derived from International standard _____ and the same with little modifications has been adapted by India which is _____	5	CO5

SECTION B			
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S. No	Answer all the following:	50 Marks	Mapped CO
Q 7	Define step and contact potentials. Discuss their significance with practical example for each of them.	2+8	CO1
Q 8	Explain the working and operation of various types of LCPDs.	10	CO2
Q 9	Discuss various charge accumulation mechanisms in case of combustible dust/powder handling operations.	10	CO3

Q 10	Explain Raphlee's methodology of Arc Flash boundary calculations and state relevant reference standard for the same.	10	CO4
Q 11	What do you mean by IP rating? Explain its significance and various levels of IP rating as per NEMA.	10	CO5

SECTION-C

S. No	Answer any one of the following	20 Marks	Mapped
Q 12	 <p>For the power system network shown in the figure, the specifications of the component are as follows: G1: 25 KV, 100 MVA, X=9% G2: 25 KV, 100 MVA, X=9% T1: 25 / 220 kV, 90 MVA, X=12% T2: 220 KV/25 kV, 90 MVA, X=12% Transmission Line 1: 220 KV, X=150 ohms Choose 25 KV as the base voltage at the generator G1 and 200 MVA as the MVA base and calculate P.U. vales for the same.</p> <p style="text-align: center;">[OR]</p> <p>Explain IEEE's methodology of Arc Fault Calculation both for low and high voltage level equipment.</p>	20	CO5