UNIVERSITY WITH A PURPOSE

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

Course: Electrical Safety **Semester : I**
Program: M.Tech. – HSE **Duration: 03 hrs.**
Course Code: HSFS 7014 **Max. Marks: 100**

SECTION A
(Scan and upload) (5Qx 4M = 20 Marks)

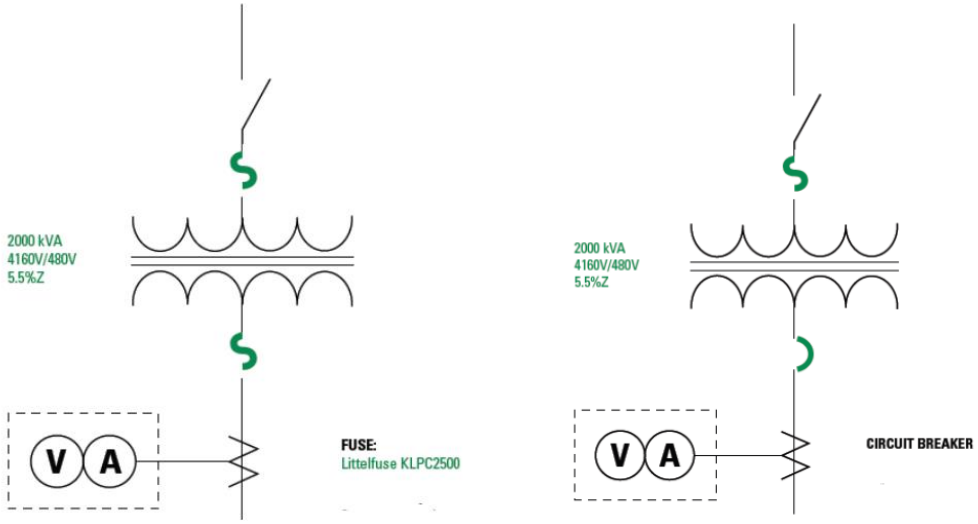
S. No.		Marks	CO
Q 1	Briefly explain Grounding and how does it protect from electrical accident.	**4**	**CO3**
Q 2	Expand the following abbreviation of Standards and safety organizations: • NFPA • NEMA • ANSI • ASTM	**4**	**CO3**
Q 3	Briefly explain the term "Interrupting Rating" related to fuse and circuit breaker.	**4**	**CO4**
Q 4	List various insulation used for Rotating Machineries.	**4**	**CO3**
Q 5	Mention preventive and protection measures to prevent static accumulation.	**4**	**CO1**

SECTION B
(Scan and upload) (4Qx 10M = 40 Marks)

Q 1	State three main objectives of Earthing and discuss general guideline for same.	**10**	**CO4**
Q 2	List and explain common electrical hazards found on construction sites.	**10**	**CO2**
Q 3	Describe Current type Earth leakage circuit breaker with the help of diagram.	**10**	**CO4**
Q 4	Classify hazardous area according to "IEC 60079-10-part-1, IS 5572:2009, NEC chapter V: zonal classification" and give few examples in each zone category.	**10**	**CO2**

Section C

(Scan and upload) **(2Qx 20M = 40 Marks)**

Q 1	Correctly preparing the equipment and insulation testing is crucial to our safety and the well-being of our wiring and machinery. Explain in detail the step by step process to adhere before every insulation test.	**20**	**CO1**
Q 2	Calculate and compare the Hazard Risk Category (HRC), Incident Energy (cal/cm²) at 18 inches working distance , Flash Protection Boundary (FPB) and PPE (Personal Protective Equipment) required to work on an energized 480V system protected by either 2500 Amp Class L fuses (clearing time 0.015 sec) or a 2500 Amp low voltage power circuit breaker (clearing time 0.076 sec).  ** $EMB = 1038.7\ {D_B}^{-1.4738}\ t_a\ [0.0093\ F^2 - 0.3453\ F + 5.9675]$ **OR** Discuss in detail the IEEE 1584 outlines 9 steps necessary to properly perform an Arc-Flash hazard that simplify the calculation of incident energy and flash-protection boundaries calculation.	**20**	**CO5**