

KATHMANDU UNIVERSITY  
End Semester Examination  
July, 2018

JUL 13 2018

Level : B.E.  
Year : IV  
Time : 2 hrs. 30 mins.

Course : EPEG 415  
Semester: II  
F. M. : 40

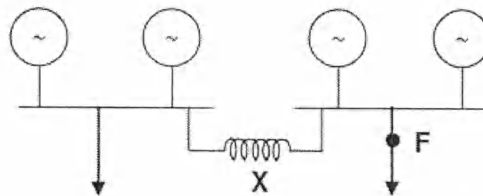
SECTION "B"

[4Q × 10 = 40 marks]

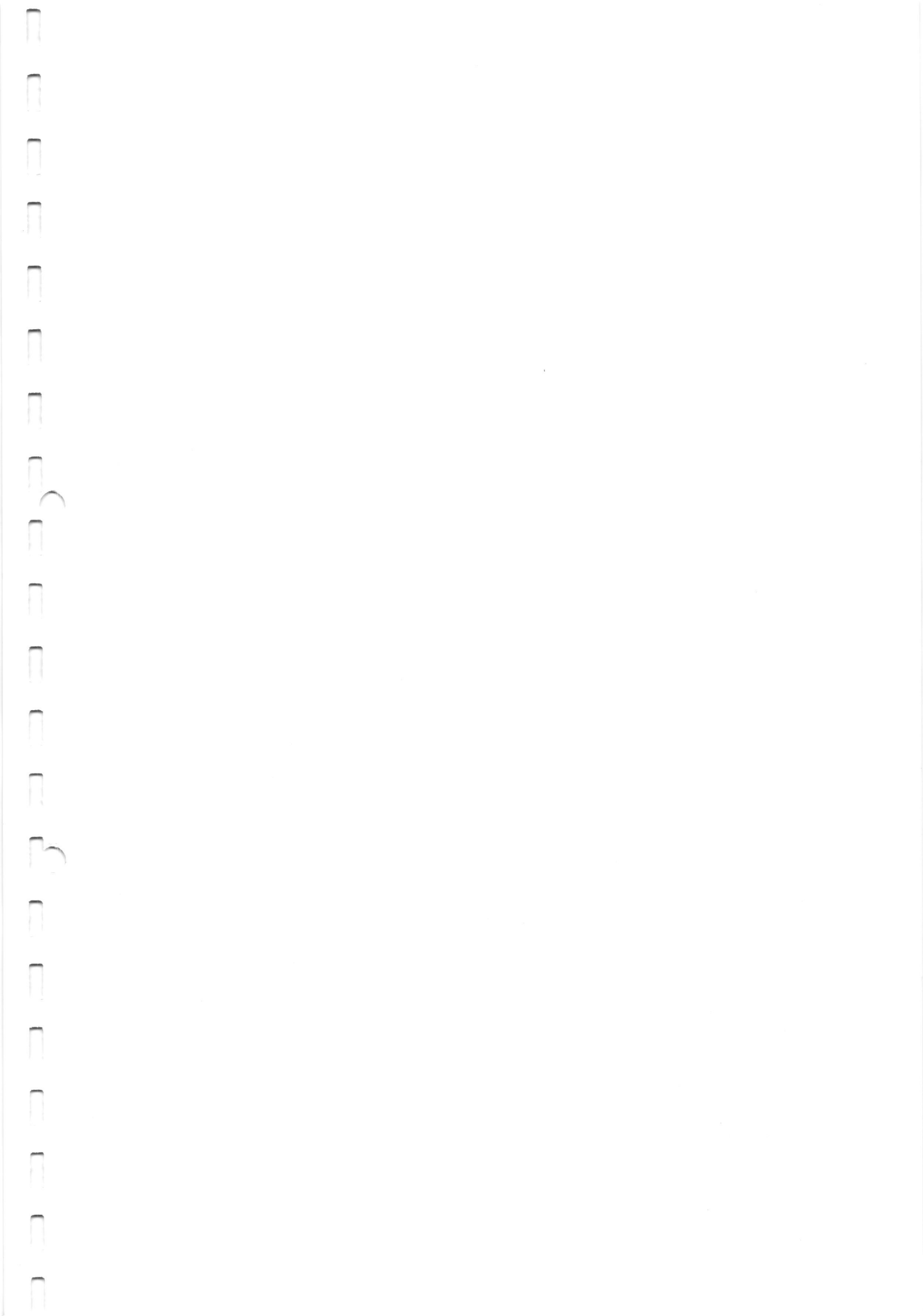
Attempt *ANY FOUR* questions.

1. a) Discuss various zones of protection of a power system with the help of line diagram. What are the basic requirements of protective relaying schemes? [2+2]  
b) Explain the differences between fusing current and current carrying capacity of a fuse. Describe the HRC fuse with a tripping device with a neat sketch. State its advantages over as HRC fuse without tripping device. [2+4]
2. a) Explain the fault clearing process by giving oscillographs of short circuit current. What is the significance of RRRV in operation of a circuit breaker? [3+2]  
b) Describe in detail the need (application) of current limiting reactors. In the 4 alternator system shown in fig, Find the reactance of the current limiting reactor **X** required to limit the fault level at **F** in a feeder to 500 MVA. [2+3]

Each alternator is rated  
25 MVA, 11 kV with  
reactance of 16 %



3. a) Explain with the help of neat diagram the working of Induction type directional overcurrent Relay. [5]  
b) Discuss the phenomenon of travelling wave over a transmission line conductors. Explain how Expulsion type diverter works. [2+3]
4. a) Describe the Merz-Price circulating current system for the protection of transformers. [5]  
b) Explain the translay protection schemes for feeders. [5]
5. a) Describe the working of Buchholz relay. Discuss important faults on an alternator. [3+3]  
b) A 3 phase alternator has the voltage of 11 kV. The generator is connected to a circuit breaker. The inductive reactance up to the circuit breaker is  $5\Omega/\text{phase}$ . The distributed capacitance up to circuit breaker between phase and neutral is  $0.001\mu\text{F}$ . Determine peak restriking voltage across the CB, frequency of restriking voltage transients, average rate of restriking voltage up to peak restriking voltage, maximum RRRV. [4]



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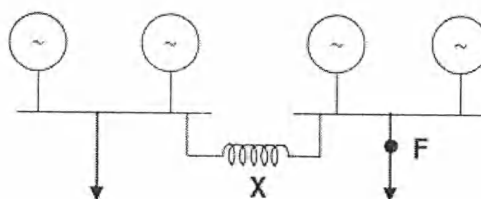
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