

324741(24)

BE 7th Semester (New Scheme)

Examination Nov-Dec 2019

Branch: Electrical, EEE

Power Apparatus System

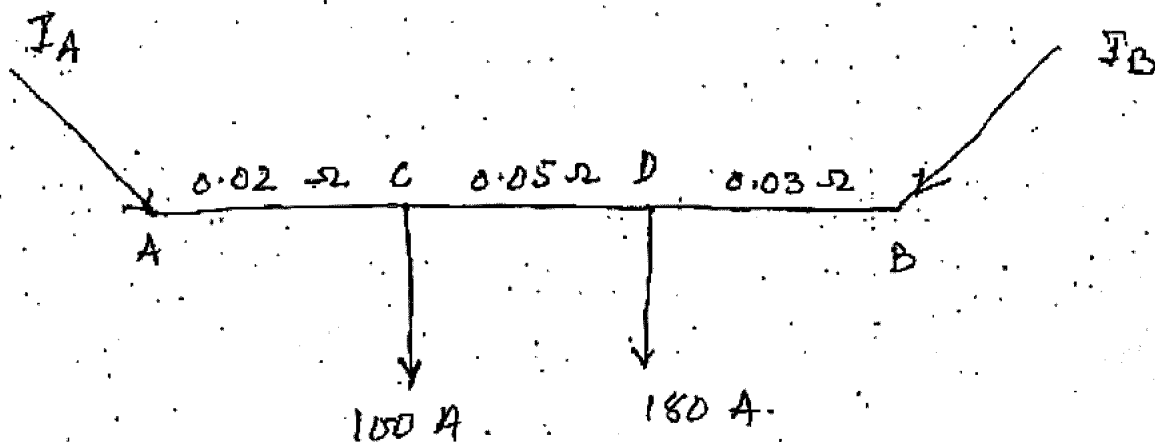
Time Allowed : Three Hours

Maximum Marks : 80

Passing Marks : 28

Note : Attempt all questions. Part (a) is compulsory and attempt any two parts from remaining parts of each question.

- Q.1(a). What are the factors which affects the SAG in a transmission line. [2]
- (b). Explain that why the voltage distribution across each insulators is not uniform. [7]
- (c). What is primary function of a ground wire in a transmission line? How span, number of circuit and conductor configuration are selected in a transmission line. [7]
- (d) Find maximum SAG of a line with copper conductor 7/0.295 cm size, area 0.484 cm^2 overall diameter 0.889 cm, weight 428 kg/km and breaking strength 1973 kg. Use a factor of safety 2, span 2 m and level supports.
- (a) Due to weight of conductor
- (b) Due to additional weight of ice loading of 1 cm thickness. [7]
- Q.2(a). Define loss factor in a distribution system. [2]
- (b). Enumerate different distribution schemes used in a distribution system. Draw schematic diagram and write merits. [7]
- (c). Discuss factors which are considered for designing of a distribution system. [7]
- (d). Following figure shows a two wire line (d.c.) fed at both ends A and B at 255 and 250 volts respectively. The loads and resistances of distributor (both wire) are shown. Find the currents fed at A and B and voltages at points C and D. [7]



- Q.3(a). Write two advantages of power system Neutral grounding. [2]
- (b). Describe the working principle of Solid grounding system. Draw suitable vector diagram. [7]
- (c). Discuss the role of Zig-Zag transformer in a power system. Draw necessary diagram. [7]
- (d). A 230 kv, 3 phase, 50 Hz, 200 km, transmission line has capacitance to earth of $0.02 \mu\text{F/km}$ per phase. Calculate the inductance and KVA rating of peterson coil used for earthing. [7]

- Q.4(a). Draw standard wave shape of an impulse voltage. [2]
- (b). Describe external and internal causes of over voltage in power system. What are consequences of this over voltage. [7]
- (c). Describe working principle of a valve type lightening arrester. Draw suitable diagram. [7]
- (d). What is insulation coordination & how it is achieved among substation equipments. Explain. [7]

- Q.5(a). Define outage in a power system. [2]
- (b). Explain approximate method for reliability evaluation & derive necessary equation. [7]
- (c). What necessary steps are taken in reliability planning and how reliability models of a power system are developed [7]
- (d). A circuit is formed by 3 components A, 2 components B and 1 component C in series. The failure rates of components are :
- $\lambda_A = 3 \times 10^{-3}$ failure/hour
- $\lambda_B = 2 \times 10^{-3}$ failure/hour
- $\lambda_C = 4 \times 10^{-3}$ failure/hour
- The components follow exponential distribution. Find the reliability of circuit for an operating Time of 20 Hrs. Also find MTTF. [7]
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