

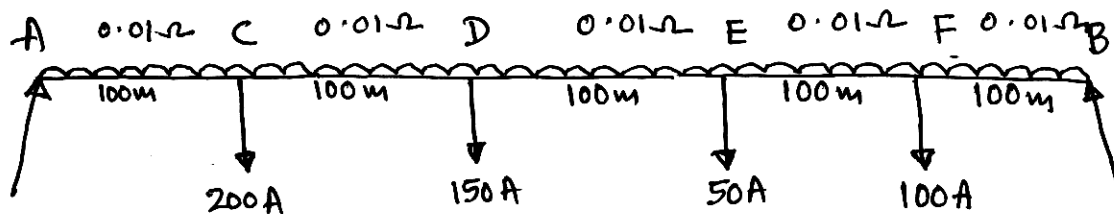
**BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING
(EVENING) EXAMINATION, 2019(Old), (2ND Year, 1ST Semester)
POWER SUPPLY SYSTEMS**

Time: 3 hours, Full Marks: 50, Use separate Answer Scripts for each part.

PART-I

Answer any **three** questions. **Two** marks reserved for neatness.

- Q1(a)** (i) What type of transformer is used for distribution purposes? 5 x 2 marks
 (ii) What is the phase to neutral voltage on the secondary side?
 (iii) What is the voltage variation allowed on the secondary side?
 (iv) What is the frequency variation allowed?
 (v) What is the difference between a feeder and a distributor?
- (b) Draw a simple ring main power distribution scheme and show the LT and HT loops clearly. 6 marks
- Q2(a)** Draw the breaker and a half bus scheme in a substation. 10 marks
- (b) Prove the advantages of high voltage for transmission. 6 marks
- Q3(a)** Prove the advantages of DC for transmission. 6 marks
- (b) Compare the copper efficiencies for DC 3 wire and ac 3 phase overhead transmission systems. 6 marks
- (c) State and explain Kelvin's law for conductors. 4 marks
- Q4(a)** Draw the voltage and current profiles for a uniformly loaded distributor fed at one end. 6 marks
- (b) A 2 wire dc distributor 500m long has a uniformly distributed load of 1A/m. There are concentrated loads of 200A, 150A, 50A and 100A at 100, 200, 300 and 400m respectively from the end A. The distributor resistance is 0.1Ω/km (go and return). Determine the value of the minimum potential and the position of the minimum potential on the distributor if the distributor is fed at both ends at 250V. 10 marks



[Turn over

- Q5(a)(i)** Explain the difference between Equipment Earthing and System Neutral Earthing. 4 marks
(ii) What is the normal value of earthing resistance and how can it be lowered?
- (b) (i) What are the advantages of stranded conductors? 4 marks
(ii) What is the general formula for number of strands for a 1 core construction ?
- (c) (i) Draw the time current characteristic for a fuse. What materials are used in fuses? 4marks
(ii) Define fusing factor. What is its importance?
- (d)(i) What is the limitation on the points in a residential house wiring scheme? 4 marks
(ii) What is the function of the choke and starter in a fluorescent tube circuit?

BACHELOR OF ELECTRICAL ENGINEERING (EVENING) EXAMINATION 2019
(SECOND YEAR FIRST SEMESTER) (Old)

POWER SUPPLY SYSTEMS

Time: Three hour

Full marks: 100

50 marks for each part Use a separate Answer Script for each part

PART – II

Answer Question 1 and any two from the rest.

1. Write short notes on any six: **6X3**
 - a) Economiser.
 - b) Surge tank in hydro power plant.
 - c) Crushing of coal.
 - d) Chain reaction in nuclear reactor.
 - e) Catchment area.
 - f) Measurement of water flow in river.
 - g) Coolant in nuclear reactor.
 - h) Excess air coefficient.
 - i) Run of river with pondage hydro power plant.
 - j) Reaction turbine.

2. a) Describe draught system in a coal fired power plant. **7**
 - b) For large alternator H₂ cooling is preferred. Why? **3**
 - c) In a reservoir water flow from January to December in a year is as follows: 150/250/750/1650/1450/1850/2250/1650/850/650/250/250 cu.m per sec. What will be the average power generation throughout the year if available head is 40 meters? **6**

3. a) Boiler feed water is to be demineralised. State the reasons. **3**
 - b) What are the advantages of gas turbine power station? **3**
 - c) Describe two types of dam constructed in reservoir? **5**
 - d) Deduce the relation to find the quantity of air required for burning of coal, considering coal contains carbon, hydrogen, sulphur, oxygen and ash. Take Excess Air Coefficient as 1.2, and air contains 23.2% oxygen by weight. **5**

4. a) What are the functions of Moderator and Control Rods in Nuclear Power Plant? **4**
 - b) Describe the function of ESP. **4**
 - c) Describe coal unloading process. **3**
 - d) How condenser vacuum is created? **3**
 - e) For what type of water flow and head Kaplan turbine is preferred? **2**