J. C. Bose University of Science & Technology, YMCA Faridabád

Department of Electrical Engineering

Sessional 2nd (B. Tech 1st Sem R&AI) M/I 2 M I2

Basic Electrical Technology (ESC101A)

Session July 2025-Dec 2025

Time: 1:30 Hrs   M. Marks: 15

Note: *It is compulsory to answer all the questions of Part -A in short. Attempt any two questions from part-B.*

PART-A

Q.1.a) Define the term power factor. (CO2)   (1)

b) Add voltage $V_1 = (-8 + j\ 6)$ volts to $V_2 = (10 + j\ 5)$ volts and   (1)
express the result in polar form. (CO2)

c) Why transformer cores are laminated? (CO3)   (1)

d) Write any three advantages of three-phase system over   (1)
single-phase system. (CO2)

e) What is the function of commutator in a DC machine? (CO3)   (1)

PART-B

Q.1) A resistance of 20 Ω is connected in series with a capacitance   (5)
of 100μF across a 250V, 50 Hz supply. Find circuit
impedance, current supplied, active power, and power factor.
Draw a neat phasor diagram also. (CO2)

Q.2) Three identical inductive loads of resistance 20Ω and   (5)
reactance 15 Ω per phase are connected in star to a 400 V, 3-
phase supply. Calculate (i) phase current (ii) line current and
(iii) active and reactive power. (CO2)

Q.3) Explain the working of a single-phase transformer at no load   (5)
condition. Draw the phasor diagram and equivalent circuit at
no load. (CO3)

Q.4) Describe construction and working of three phase induction   (5)
motor. (CO3)