

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018-19 Examination

Semester: 6

Subject Code: 03106351

Subject Name: Power System - II

Date: 30/04/2019

Time: 10:30am To 01:00pm

Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions (Each of one mark)**(15)**

- 1 Ferranti effect will not occur in which of the following transmission lines
 - a) long transmission lines
 - b) short transmission lines
 - c) medium transmission lines
 - d) all of the above
- 2 In a long transmission line, if we increase the length of the line, the parameters A and B respectively
 - a) increases and increases
 - b) decreases and decreases
 - c) decreases and increases
 - d) increases and decreases
- 3 A circuit breaker is
 - a) power factor correcting device
 - b) a device to neutralize the effect of transients
 - c) a waveform correcting device
 - d) a current interrupting device.
- 4 Which of the following circuit breaker can be installed on 400 kV line
 - a) Tank type oil circuit breaker
 - b) Miniature circuit breaker
 - c) Vacuum circuit breaker
 - d) Air blast circuit breaker.
- 5 In which type of faults given below all the three components I_{a0} , I_{a1} , I_{a2} are equal
 - a) Single line to ground fault
 - b) Line to line fault
 - c) Double line to ground fault
 - d) Symmetrical fault
- 6 Calculate for which power factor zero voltage regulation is possible?
- 7 Calculate Voltage Regulation of short transmission line if $V_s = 33\text{kv}$ and $V_r = 0\text{kv}$?
- 8 If the rated receiving end voltage is 33 kV, then Calculate the limits for safe operation of equipments?
- 9 What is air pressure in air blast circuit breaker?
- 10 Calculate the ABCD constants of short transmission line?
- 11 For a given Voltage regulation and I, the regulation of the line _____ with the decrease in p.f. for lagging loads.
- 12 The shunt admittance of a transmission line is 3 microsiemens. Its complex notation will be _____.siemen.
- 13 The most frequently occurring fault in a power system is _____
- 14 $a-a^2 =$ _____
- 15 The positive sequence impedance of a transmission line is _____ to the negative sequence impedance.

Q.2 Answer the following questions. (Attempt any three) (15)

A Prove that:

- 1) $(1-a^2)/(a-a^2) = -a$
- 2) $(1-a)/(1+a^2) = 1-a^2$
- 3) $1+a+a^2 = 0$

B Define:

- 1) Recovery Voltage
- 2) Restriking Voltage
- 3) Arc Voltage
- 4) Rated Frequency
- 5) Amplitude Factor

C Draw positive, negative and zero sequence diagram for below figure.



D Give Classification of circuit breaker.

Q.3 A) Analyze transients on transmission line (RL series circuit.) (07)

B) Show that in double line to ground fault of unloaded generator is (08)

$$I_a^1 = \frac{V_f}{\left(Z_1 + \frac{Z_2 Z_0}{Z_2 + Z_0} \right)}$$

OR

B) Starting from the first principles, show that surges behaves as travelling waves. Find expression for surge impedance and wave velocity.

Q.4 A) With the help of Vector diagram demonstrate the performance of medium transmission line using nominal π method. (07)

OR

A) Explain construction and working of minimum oil circuit breaker. (07)

B) Explain symmetrical components and state their applications. Derive symmetrical components of a given set of three unbalanced current phasors. (08)