

## Unit 5 - Week 4

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## Assignment 4

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2020-10-14, 23:59 IST.**

1) For a balanced healthy power system, the positive sequence voltage ( $V_1$ ) is equals to \_\_\_\_\_. Here,  $V_A$ ,  $V_B$  and  $V_C$  are voltage of phase A, B, and C, respectively. Term  $\alpha = 1 \angle 120^\circ$ . **1 point**

- $V_1 = (V_A + \alpha V_B + \alpha^2 V_C)$   
  $V_1 = (V_A + \alpha V_B + \alpha^2 V_C)/3$   
  $V_1 = 3(V_A + \alpha^2 V_B + \alpha V_C)$   
  $V_1 = (V_A + \alpha^2 V_B + \alpha V_C)/3$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $V_1 = (V_A + \alpha V_B + \alpha^2 V_C)/3$

2) A 132 kV transmission line has an impedance of  $4 + j16 \Omega$ . This line is protected by mho type distance relay (having characteristic angle  $= 60^\circ$ ) with CT ratio = 1000/1 A and PT ratio = 132 kV/110 V. The zone-1 of the relay covers 80% of the line length whereas the zone-2 covers 150% of the line length. The first and second zone setting of the relay are **2 points**

- 20  $\Omega$  and 10.67  $\Omega$ , respectively  
 11.43  $\Omega$  and 21.44  $\Omega$ , respectively  
 10.67  $\Omega$  and 20  $\Omega$ , respectively  
 26  $\Omega$  and 10.67  $\Omega$ , respectively

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
11.43  $\Omega$  and 21.44  $\Omega$ , respectively

3) A transmission line is feed from local end A and remote end B. The impedance of the whole transmission line is  $5 + j20 \Omega$ . The fault occurs at a point F on the line and the impedance from the relaying point A to the fault point F, i.e.,  $Z_{AF} = 2.5 + j10 \Omega$ . The fault resistance ( $R_F$ ) is  $15 \Omega$ . The fault current contribution from bus A to the fault, i.e.,  $200 \angle -76.36^\circ$ . The contribution of fault current from bus B to the fault, i.e.,  $300 \angle -84.29^\circ$ . Determine the apparent impedance seen by the relay at A. **2 points**

- $20.16 \angle -49.74^\circ$   
  $10.16 \angle -29.74^\circ$   
  $20.16 \angle 29.74^\circ$   
  $20.16 \angle 19.74^\circ$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $20.16 \angle -29.74^\circ$

4) Which of the following relay have less tendency of undesired operation during the power swing condition? **2 points**

- impedance relay  
 reactance relay  
 mho relay  
 quadrilateral relay

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
quadrilateral relay

5) Which of the following relay characteristic has the higher loadability limit? **2 points**

- impedance relay  
 reactance relay  
 mho relay  
 quadrilateral relay

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
quadrilateral relay

6) Pilot protection provide which of the following advantage **0 points**

- simultaneous tripping at both ends of line  
 low cost protection as compared to conventional protection scheme  
 instantaneous tripping at both ends of line  
 none of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
simultaneous tripping at both ends of line

7) A carrier signal used for protection can also be utilized for **1 point**

- telemetering  
 supervisory control  
 communication  
 all of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
all of the above

8) The advantage of fibre optics communication is **1 point**

- high bandwidth  
 low cost  
 ease to install and maintain  
 none of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
high bandwidth

9) The frequency of carrier signal transmitted through a microwave channel is in the range of **1 point**

- 0.3-3 kHz  
 0.3-3 GHz  
 0.3-3 MHz  
 none of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
0.3-3 GHz

10) Wire pilot relaying scheme is used for the protection of **1 point**

- long transmission line  
 medium transmission line  
 short transmission line  
 all of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
short transmission line