OBJECTIVES

This course gives the complete knowledge of electrical distribution systems, the design of feeders, substations. It also gives conceptual knowledge on how to determine the performance of a distribution system through its important parameters i.e. voltage drops and power loss and the very important thing that protection of the system by means of protective devices and their co-ordination during the several fault conditions. It also specifies how to improve the voltage profiles and power factor of the system to better value using various voltage control and compensation techniques.

QUESTION BANK ON SHORTANSWER QUESTION

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT -1 GENERAL CONCEPTS		
1	Discuss about load management functions?	Understand	1
2	Define Demand?	Remember	1
3	Obtain the relation between the load factor and loss factor?	Remember	1
4	Discuss about coincidence Factor?	Remember	1
5	Discuss about contribution factor.	Remember	2
6	Discuss about loss factor.	Remember	2
7	What is load factor?	Remember	2
8	Discuss about load diversity.	Remember	4
9	What is Maximum demand?	Remember	1
10	Explain coincident demand?	Remember	1
11	What is Non-coincident demand?	Understand	1
12	What is meant by term load? How loads can be classified?	Understand	1
13	What is distribution system?	Understand	1
	UNIT – II DISTRIBUTION FEEDERS		

S. No	Question	Blooms Taxonomy Level	Course Outcome
1	Discuss the differences between radial and loop types of primary distribution feeders	Remember	1
2	Draw neat sketches radial type and loop type sub transmission systems	Understand	1
3	Define the terms feeder and Distributor	Create	4
4	What are the advantages and disadvantages of loop type primary distribution feeder	Remember	1
5	Draw the neat sketch of ring main distribution system.	Remember	1
6	Compare Radial and loop type feeders.	Remember	1
7	What are the advantages and disadvantages of radial type primary distribution feeder	Remember	1
8	Compare loop type and ring main.	Remember	1
9	What are the advantages and disadvantages of Switching scheme of Single bus.	Remember	1
10	What are the advantages and disadvantages of ring bus scheme	Remember	1
11	What are the advantages and disadvantages of inter connected primary distribution feeder	Understand	4
12	What are the advantages and disadvantages of Switching scheme of Double bus double breaker	Understand	2
	UNIT – III SUBSTATIONS		
1	Define substation.	Remember	3
2	Define distribution transformer.	Remember	3
3	Give the classification of Different types of substations.	Remember	3
4	What are the advantages and disadvantages of Outdoor Substations	Understand	3
5	What are the rules to be considered to locate the substation	Remember	3
6	Discuss advantages of optimal location of substation?	Remember	3
7	What are the advantages and disadvantages of Indoor Substations	Remember	3
8	What are the advantages and disadvantages of Underground Substations	Analyze	3
9	Discuss about industrial substation.	Remember	3
10	Differentiate Indoor and outdoor substation?	Evaluate	3
	UNIT – IV SYSTEM ANALYSIS		
1	Define multi grounded system	Remember	1
2	Define real power	Remember	1
3	Define reactive power	Remember	1
4	Define apparent power	Understand	2
5	Define power loss	Remember	1
6	Define voltage drop	Remember	1
7	Discuss voltage drop for loads of different power factor	Remember	1
8	Discuss the voltage drop for uniformly distributed load	Analyze	1
	UNIT –V PROTECTION		
1	Describe the operating principle of Fuses	Remember	5
2	Describe the operating principle of Circuit breakers	Remember	5

S. No	Question	Blooms Taxonomy Level	Course Outcome
3	Describe the operating principle of Line sectionalizer	Remember	5
4	Define Fuse	Understand	5
5	What is the main objective of distribution system protection?	Understand	5
6	What are the advantages of circuit breaker	Remember	5
7	Define Circuit recloser	Remember	5
8	Define Circuit breaker?	Remember	5
9	Define relay?	Remember	5
10	Discuss about transmission line protective devices	Remember	5
	UNIT –VI COORDINATION		
1	Define coordination	Remember	5
2	Discuss about importance of coordination	Remember	5
3	Define protective device	Remember	5
4	Discuss about advantages of fuse to fuse coordination	Remember	5
5	Difference between the fuse to fuse coordination and fuse to recloser coordination	Remember	5
6	Define fuse to recloser coordination	Remember	5
7	Discuss about advantages and disadvantages of fuse to recloser coordination	Remember	5
8	Discuss about Advantages and disadvantages of fuse to circuit breaker coordination.	Evaluate	5
	UNIT –VII COMPENSATION FOR POWER FACTOR IMPROVEMENT		
1	Discuss the disadvantages of low voltage and low p.f of the system?	Remember	6
2	Discuss the importance of power factor correction	Analyze	6
3	Discuss the financial benefits due to voltage improvement	Analyze	6
4	Discuss advantages of series compensation	Analyze	6
5	Discuss importance of shunt capacitor compensation	Remember	6
6	Discuss benefits due to released distribution substation capacity	Remember	6
7	Define power factor?	Remember	6
8	Discuss advantages of shunt compensation	Remember	6
9	Discuss about power factor correction	Remember	6
10	Discuss financial benefits due to voltage improvement	Remember	6
	UNIT –VIII VOLTAGE CONTROL		
1	Define voltage regulation	Remember	6
2	Define voltage drop	Remember	6
3	Define nominal voltage	Understand	6
4	Define rated voltage	Understand	6
5	Define utilization voltage	Remember	6
6	Discuss the applications of induction regulators	Remember	5
7	What are the advantages and disadvantages of automatic voltage booster	Understand	5
8	Define maximum voltage	Understand	6
9	Define minimum voltage	Understand	6

S. No	Question	Blooms Taxonomy Level	Course Outcome
10	Discuss use of tap-changing transformer	Understand	8

Group – II LONG ASNWERS QUASTIONS

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT -1 GENERAL CONCEPTS		
1	Explain the various factors affecting the distribution system planning.	Remember	1
2	Draw a block diagram in flow chart form for a typical distribution system planning process and explain the techniques for distribution planning.	Remember	1
3	Discuss about different load modelling and its characteristics	Create	2
4	Obtain the relation between the load factor and loss factor	Create	2
5	Discuss in detail about residential and industrial loads and their respective characteristics.	Remember	1
6	Discuss the characteristics of different loads	Create	2
7	Explain briefly the classification of loads and modeling of load in distribution networks.	Remember	3
8	Explain the load characteristics of distribution system.	Understand	3
9	Discuss the characteristics of the following categories of loads: (i) Residential (iii) Agriculture (ii) Commercial (iv) Industrial	Remember	2
10	Make a comparison between DC and AC systems	Create	2
	UNIT –II DISTRIBUTION FEEDERS		
1	What are the various factors that are to be considered in selecting a primary feeder rating? Describe the arrangement with suitable diagram.	Understand	2
2	Draw the single line diagram of radial type feeder and mention the factors that influences the selection of primary feeder	Understand	2
3	With neat sketches explain the various types of sub transmission systems.	Remember	3
4	Discuss the basic design practice of the secondary distribution system	Remember	3
5	Explain various factors that influence voltage levels in design and operation of the distribution system	Remember	3
6	Distinguish between primary and secondary distribution systems with suitable examples.	Remember	3
7	State the Different voltage levels of secondary distribution system	Remember	3
8	Classify different types of primary feeders and give their merits and demerits	Remember	2
9	Derive the condition of load factor for which the voltage drop is maximum	Remember	2
10	Explain radial type primary feeder with neat diagram	Create	2
11	Draw and explain secondary network supplied by three primary feeders.		2
	UNIT –III SUBSTATIONS		

S. No	Question	Blooms Taxonomy Level	Course Outcome
1	What are the various factors that are to be considered in selecting optimal location of substation?	Remember	4
2	Compare the four and six feeder's patterns in substation location.	Create	4
3	How the rating of distribution substation can be calculated. Explain taking a general case with `n' no. of feeders	Remember	1,2
4	How do you analyze a substation service area with `n' primary feeders	Remember	4
5	Discuss how the rating of distribution substation is fixed	Create	4
6	Explain the criteria for location of a substation and what are the benefits obtained through optimal location of Substation	Remember	4
7	Explain the single bus bar system with sectionalization and what are its merits and demerits.	Remember	4
8	Explain the main and transfer bus bar system with circuit diagram.	Understand	4
9	What is the difference between single bus bar with and without sectionalization arrangement?	Create	4
10	Discuss about the classification of different types of substations. State the advantages and disadvantages of Each substation.	Create	4
	UNIT –IV SYSTEM ANALYSIS		
1	Derive an approximate voltage drop & power loss equation of primary feeder and give the condition for load p.f. at which voltage drop is maximum	Remember	6
2	Prove the power loss due to the load currents in the conductors of single-phase lateral ungrounded neutral case is 2 times larger than one in the equivalent three phase lateral	Remember	2
3	Discuss about non-three phase primary lines.	Understand	4
4	Prove the power loss due to load currents in the conductors of the 2-phase, 3 wire lateral with multi-grounded neutral is approximately 1.64 times larger than the one in the equivalent 3-phase lateral	Understand	4
5	In terms of resistance and reactance of the circuit, derive the equation for load power factor for which voltage drop is minimum	Understand	3
6	What are the power losses in A.C distribution? how it is estimated approximately	Remember	3
7	What is the importance of % Voltage drop in feeder lines? What are the factors that affect % voltage drop?	Understand	2
8	Discuss a four wire multi-grounded common neutral distribution system.	Remember	3
9	Discuss about the different types of manual methods used for the solution of radial networks? Explain them	Understand	3
10	Prove that the power loss due to the load currents in the conductors of single-phase lateral ungrounded neutral case is 2 times larger than one in the equivalent three phase lateral.	Understand	2
	UNIT –V PROTECTION		
1	The per unit values of positive, negative and zero sequence reactance's of a network at fault are 0.08, 0.07 and 0.05 respectively. Determine the fault current if the fault is double line to ground.	Remember	5
2	Discuss advantages and disadvantages of fuses	Remember	5
3	Discuss about when maximum faults and minimum faults occur in distribution system.	Remember	5
4	What are the objectives of a distribution protection?	Understand	5

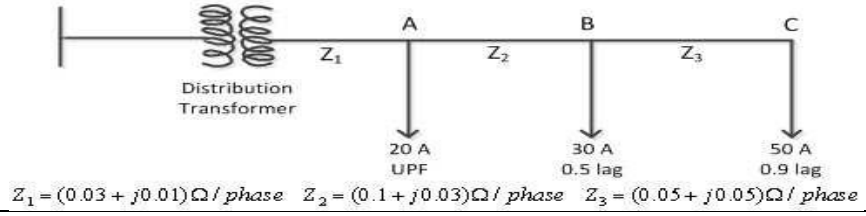
S. No	Question	Blooms Taxonomy Level	Course Outcome
5	Discuss the Principle of a circuit recloser used in protection of distribution system	Understand	5
6	Discuss the procedure for fault current calculation in following faults. i. Double Line Ground fault ii. Line-Line fault.	Understand	5
7	What are the common faults occur in distribution system? Explain with line diagrams	Understand	5
8	Discuss the procedure for fault current calculation in following faults. i. Three phase Ground fault ii. Phase to phase ground fault.	Understand	5
9	What are the common types of faults in a single phase 2-wire and 3-wire systems? Explain how fault current is computed with proper single line diagrams.	Understand	5
10	Explain briefly secondary system fault current calculation for, a. Single phase 120/240 V three wire secondary service b. Three phase 240/120 star/ delta or delta/star four secondary	Understand	5
	UNIT –VI **COORDINATION**		
1	Discuss the overall coordination procedure employed for protection of distribution systems	Understand	5
2	Discuss in detail how the co-ordination of various protective devices helps in improving system performance	Understand	5
3	Discuss about Fuse-Fuse coordination	Analyze	5
4	Discuss about Fuse-Circuit breaker coordination	Analyze	5
5	Discuss about different types of coordination of protective devices	Analyze	5
6	What is the data required for the general coordination procedure?	Analyze	5
7	Discuss briefly the general coordination procedure?	Analyze	5
8	Discuss recloser-circuit breaker coordination.	Analyze	5
9	Discuss about Fuse-Recloser coordination.	Remember	5
	UNIT –VII **COMPENSATION FOR POWER FACTOR IMPROVEMENT**		
1	Discuss the effect of shunt compensation on distribution system	Understand	6
2	Compare and explain the role of shunt and series capacitors in power factor correction.	Remember	6
3	What are the differences between fixed and switched capacitors? What are their effects on distribution systems	Remember	6
4	Discuss the procedure employed to determine the best capacitor location	Remember	6
5	Discuss how a series capacitor boosts the voltage with the help of a phasor diagram? What are the drawbacks of this method?	Remember	6
6	Discuss different types of capacitors used in distribution network to improve p.f	Remember	6
7	Why the improvement of power factor is very important for both consumers and generating stations? List the various causes of low power factor and explain	Remember	6
8	How economic power factor arrived at for a given distribution system with different loads?	Remember	6
9	Voltage control and p.f correction are necessary in power systems. Explain. What are the disadvantages of low voltage and low p.f of the system?	Remember	6
10	Discuss how an overexcited synchronous machine improves power factor.	Remember	6
	UNIT –VIII **VOLTAGE CONTROL**		

S. No	Question	Blooms Taxonomy Level	Course Outcome
1	How an AVR can control voltage? With the aid of suitable diagram, explain its function.	Understand	7
2	Briefly explain the line drop compensation on voltage control.	Create	6
3	How do the shunt capacitors and reactors control the voltage? List the disadvantages of using a shunt capacitor for voltage control	Remember	6
4	Compare and explain the role of shunt and series capacitor in voltage control.	Understand	7
5	Describe different types of equipment for voltage control with neat diagrams.	Understand	6
6	Discuss need for maintaining good voltage profile in power systems and need to improve power factor.	Analyze	6
7	Discuss the various methods adopted for voltage control	Analyze	6
8	Discuss about the control and rating of voltage regulators	Analyze	6
9	Discuss about the induction type regulator	Analyze	7

GROUP – III ANALYTICAL QUESTIONS

<table>
<tr><th>S. No</th><th>Question</th><th>Blooms Taxonomy Level</th><th>Course Outcome</th></tr>
<tr><td colspan="4">UNIT -1</td></tr>
<tr><td>1</td><td>At the end of a power distribution system, a certain feeder supplies three distribution transformer, each one supplying a group of customers whose connected loads are as under, if the diversity factor among the transformers is 1.3, find the maximum load on the feeder.
<table>
<tr><td>Transformer</td><td>Load</td><td>Demand Factor</td><td>Diversity Factor</td></tr>
<tr><td>No.1</td><td>10kw</td><td>0.65</td><td>1.5</td></tr>
<tr><td>No 2</td><td>12kw</td><td>0.</td><td>3.5</td></tr>
<tr><td>No.3</td><td>15kw</td><td>0.7</td><td>1.5</td></tr>
</table></td><td>Apply</td><td>1</td></tr>
<tr><td>2</td><td>Distribution substation experiences an annual peak load of 3, 500 KW. The total annual energy supplied to the primary feeder circuits is 10^7 kwh. Find i)The annual average Factor ii) The annual Load Factor</td><td>Apply</td><td>1</td></tr>
<tr><td>3</td><td>Annual peak load input to a primary feeder is 2000kw at which the power loss is total copper loss at the time of peak load is $\sum I^2R$=100kw. The total annual energy supplied to the sending end of the feeder is $5.61*10^6$ kwh. Determine. I) Annual loss factor
ii) Total annual copper loss energy and its value Rs.1.50 per kwh</td><td>Apply</td><td>1</td></tr>
<tr><td>4</td><td>Assume that load of 100kw is connected at the riverside substation, the 15 min. weekly maximum demand is given as 75 kw, and the weekly energy consumption is 4200 kwh. Assuming a week is 7 days; find the demand factor and the 15 min. weekly load factor of the substation.</td><td>Apply</td><td>1</td></tr>
<tr><td>5</td><td>Discuss how the maximum demand and average demand can be obtained from daily demand variation curve.</td><td>Apply</td><td>1</td></tr>
<tr><td>6</td><td>A 50 MW hydro generator delivers 320 million kwh during the year. Calculate the plant load factor.</td><td>Apply</td><td>1</td></tr>
<tr><td>7</td><td>Annual peak load input to a primary feeder is 2000kw at which the power loss is total copper loss at the time of peak load is $\sum I^2R$=100kw. The total annual energy supplied to the sending end of the feeder is $5.61*10^6$ kwh. Determine. I)</td><td>Apply</td><td>1</td></tr>
</table>

S. No	Question	Blooms Taxonomy Level	Course Outcome
	Annual loss factor ii) Total annual copper loss energy and its value Rs0.03 per kwh		
8	Assume that the annual peak load of a primary feeder is 2000 kw , at which the power is 80 kw per three phase. Assuming an annual loss factor of 0.15, determine i) The average annual power loss. ii) The total annual energy loss due to the copper loss of the feeder.	Apply	1
9	A small city experiences an annual peak load of 3500 kw. The total annual energy supplied to the primary feeder's circuits is $10* 10^6$ kwh. The peak demand occurs in July/August and Is due to air Conditioning load. i) Find the annual average power demand ii) Find the annual load factor iii) Find the annual loss factor	Apply	1
10	The annual average load is 1241 kw and monthly peak load is 3600 kw. Find the load factor by using approximate formula.	Apply	1
	UNIT-II		
1	A 3 phase radial express feeder has a line to line voltage of 22.0 kv at the receiving end, a total impedance of 5.25+J10.95 Ω/phase, and a load of 5MW with a logging power factor of 0.90. determine the following i)Line to neutral and line to line voltage at the sending end ii) Load angle	Apply	2
2	Show that with an increase in working voltage to n times, the cross section of a feeder and a distributor would be reduced to 1/n and $1/n^2$ of their respective values.	Apply	2
3	Define secondary banking and explain different connections of secondary banking.	Apply	2
4	How do you apply an concept of ABCD constants to radial feeders?	Apply	2
5	A 2-wire DC distributor AB, 600m long as loaded as under: Distance from (metes): 150 300 350 450 Loads (Amps) : 100 200 250 300. The feeding point A is maintained at 440V and that of B at 430V. If each conductor has a resistance of 0.01 per 100 m, calculate i. The currents supplied from A to B. ii. The power dispatched in the distributor.		2
6	Find the new load and area that can be served with the same percent voltage drop if the new feeder voltage level is increased to twice the previous voltage level of the feeder.	Apply	2
7	Assume that feeder has a length of 2 miles and that the new feeder uniform loading has increased to 3 times the old feeder loading. Determine the new maximum length of the feeder with the same percent voltage drop if the new feeder voltage level is increased to 3.45 kv from the previous voltage level of 12.47 kv.	Apply	2
8	Assume that a star connected three phase load is made up of three impedances of $50\angle 25^0$ ohms each and that the load is supplied by a three phase four wire primary express feeder. the balanced line to neutral voltages at the receiving end are $v_{an}=7630\angle 0^0$V, $V_{bn}=7630\angle 240^0$v, $V_{cn}=7630\angle 120^0$ v. Determine the following, a) The phase currents in each line b) The line to line phase voltages c) The total active and reactive power supplied to the load.	Apply	2
9	Derive the equations for voltage drop and power loss in a radial feeder with	Apply	2

S. No	Question	Blooms Taxonomy Level	Course Outcome
	uniformly distributed load.		
10	Discuss the various substation bus schemes? Explain them with neat sketches.	Apply	2
	UNIT-III		
1	Derive the total area served by four feeders is 0.667 times the total area served by six feeders if they are thermally loaded	Apply	2
2	Discuss about the methodology to fix the rating of a distribution substation.	Analyze	4
3	A three phase 4.16 kv wye grounded feeder main has 4 copper conductors with an equivalent spacing of 1.0 m between phase conductors and a lagging load power factor of 0.9. determine the 'k' constant of the main feeder, let, r=1.503Ω/m, and x=0.7456 Ω/m Also, calculate the percent voltage drop in the main, if a lumped sum load of 500 kva with a lagging p.f of 0.9 is connected at the load end of 1 m long feeder main.	Apply	2
6	Calculate % voltage drop of hexagonally shaped area of distribution substation.	Apply	4
7	Calculate the % voltage drop in the main, if load 500 kva is uniformly distributed along the feeder main is shown in figure .Consider K=0.01% VD(kva-miles).	Apply	3
8	Define 'k' constant and give its importance.	Apply	4
	UNIT-IV		
1	Consider a three phase, 3 wire 240V secondary with balanced loads at A,B and C as shown in figure determine: i. The voltage drop in one phase of lateral ii. The real power per phase for each load iii. The reactive power per phase for each load.  $Z_1 = (0.03 + j0.01)\Omega/phase \quad Z_2 = (0.1 + j0.03)\Omega/phase \quad Z_3 = (0.05 + j0.05)\Omega/phase$	Apply	3
2	Consider a single-phase, 2-wire secondary distributor of length 'I' meters from the distribution transformer .At a length of 'I_1" meters from source, a load of I_1 amps with a p.f of $\cos\Theta_1$ (lag) is tapped. At a length of 'I_2' amps with a power factor $\cos\Theta_2$ (lead) is tapped. At a length of I_3 meters from second load, a third load of I_3 amps with a UPF is tapped. If resistance and reactance of each wire are r and x ohms/meter respectively, derive approximate voltage drop equation in the distributor.	Apply	3
3	A single phase feeder circuit has total impedance (2+j6) ohms, receiving end voltage is 11 kv and current is $40\angle -45^o$ A. Determine i) P.f of load ii) Load p.f for which the drop is maximum iii) Load p.f for which impedance angle is maximum and also , derive the formula used	Apply	5
4	A single phase feeder circuit has total impedance (2+j6) ohms, receiving end voltage is 11 kv and current is $50\angle -30^o$ A. Determine i) P.f of load ii) Load p.f for which the drop is maximum Load p.f for which impedance angle is maximum and also , derive the formula	Apply	4

S. No	Question	Blooms Taxonomy Level	Course Outcome
	used		
5	A single phase feeder circuit has total impedance of (1+j3)Ω V_R= 2400∟0^o v and I_R= 50∟-30^o A, respectively. Find i) P.f of load ii) Load p.f for which the drop is maximum	Evaluate	4
6	Electrical energy is supplied to a consumer from a substation at a distance of 250 m. if the power required by the consumer is three phase 100kw at 415 v unity power factor and resistance of single conductor of the connecting cable is 0.1/1000Ω/m. calculate, i) The voltage at the bus bar of the substation ii) The power loss in the cable.	Apply	3
7	Consider the single phase radial distributor shown in the following figure The magnitude of the load currents, p.fs and distances are indicated in the figure. The resistance and reactance of each wire are 0.1 ohm and 0.2 ohms per km respectively. It is required to maintain voltage at point B as 230∟0^o volts. Find. i) Voltage drop in the three sections ii) Ii) the voltage drop in the feeder iii) Supply voltage, current and power factor iv) Kva output of supply The p.f angle of individual loads are with respect to voltage at point B	Apply	3
8	An unbalanced three phase Delta connected load is connected to balanced three phase ,Three wire source the load impedance Z_a ,Z_b and Z_c are given by 60∟30^o ohm/phase, 85∟-45^oohm/phase,50∟35^o ohm/phase respectively, the phase 'a' line voltage has been an effective value of 12.6 kv .use the A phase to Phase voltage as the reference and determine the following line currents and real and reactive powers	Apply	3
9	Consider the three phase ,three wire 240v secondary system with balanced loads at a A,B and C as shown in figure .Determine, i) Calculate the total voltage drop ii) Calculate the kva output and load p.f of the distribution transformer iii) Calculate total power per phase for each load	Apply	3
10	An unbalanced three phase star connected load is connected to balanced three phase ,four wire source the load impedance Z_a ,Z_b and Z_c are given by 70∟30^o ohm/phase, 85∟40^oohm/phase,50∟35^o ohm/phase respectively, the phase 'a' line voltage has been an effective value of 13.8 kv .use the line to neutral voltage of phase 'a' as the reference and determine the following i) line to neutral currents ii) total power delivered to the load	Apply	3
	UNIT –V		
1	Discuss the operation of line sectionalizer with a neat sketch.	Apply	3
2	The per unit values of positive, negative and zero sequence reactance's of a network at fault are 0.08, 0.07 and 0.05 respectively. Determine the fault current if the fault is double line to ground.	Apply	8
3	Considering a typical example, describe the procedure for fault current calculations in a distribution system, mentioning the assumptions to be made for the analysis.	Apply	8

S. No	Question	Blooms Taxonomy Level	Course Outcome
4	The per unit positive, negative and zero sequence impedances of a distributed network are 0.06, 0.06 and 0.04 respectively. Determine the fault current for L-L and L-G faults.	Apply	8
5	A single phase 3 wire distribution line 600V-0-160V, feeds a load of 10 kVA on each line to ground. The transformer is 7620V/240V, 25KVA with 5% impedance. The line impedance is j0.15 ohm per wire. Calculate the fault current and fault MVA for a. L-L fault 1 km from the transformer b. L-G fault 1 km from the transformer	Apply	8
6	The per unit positive, negative and zero sequence impedances of a distributed network are 0.08, 0.08 and 0.05 respectively. Determine the fault current for L-L and L-G faults.	Apply	8
7	What is the data required for the selecting a circuit breaker.	Analyze	5
8	Discuss about the automatic line sectionalizers? Discuss the purpose and advantages of using them.	Analyze	5
9	Discuss about data required for selecting a circuit breaker?	Analyze	5
10	What are the different types of over current protective devices and explain their merits and demerits.	remember	5
	UNIT –VI		
1	Discuss in detail how the coordination of various protective devices helps in improving system performance.	Apply	5
2	Discuss about recloser to recloser coordination.	Apply	5
3	Discuss the coordination procedure between two fuses	Apply	5
	UNIT –VII		
1	A 3-phase substation transformer has a name plate rating of 7500 kVA and a thermal capability of 125% of the name plate rating. If the connected load is 8816 kVA with a 0.9power factor (lagging), determine the following: i. the kVAR rating of the shunt capacitor bank required to decrease the kVA load of the transformer to its capability level ii. The power factor of the corrected level.	Apply	6
2	A 3phase transformer rated 7000kVA and has a over load capability of 125 % of the rating. Ifthe connected load is 1150 kVA with a 0.8 p.f(lag), determine the following: i. The kVAR rating of shunt capacitor bank required to decrease the kVA load of the transformer to its capability level, ii. The kVAR raring of the shunt capacitor bank required to correct the load p.f. to unity. iii. The p.f. of the corrected level.	Apply	6
3	A 440 V, 50 cycles three phase line delivers 250 KW at 0.7 p.f (lag). It is desire to bring the line p.f to unity by installing shunt capacitors. Calculate the capacitance if they are: i. star connected ii. delta connected	Apply	6
4	A 3 phase substation transformer has a name plate rating of 7250 KVA and a thermal capability of 120% of the name plate rating. If the connected load is is 8816 KVA with a 0.85 of lag p.f determine the following a. The KVAR rating of the shunt capacitor tank required to decrease the KVA load of the transformer to its capability level b. The power factor of the corrected level.	Apply	6
5	A single-phase motor takes a current of 10 amps at a p.f. of 0.707 lagging from	Apply	6

S. No	Question	Blooms Taxonomy Level	Course Outcome
	a 230V, 50 Hz supply. What value must a shunting capacitor have to raise the p.f. to unity		
6	Discuss the computerized method to determine the economic power factor.	Analyze	6
7	A 750 KVA load has a power factor of0.75 lag. It is derived to improve the power factor to 0.9 lag . Find the KVAR rating of the capacitor for the power factor improvement.	Apply	6
8	A synchronous motor having a power consumption of 40 KW is connected with a load of 150KW, a lag power factor of 0.8. if the combined load has a power factor of 0.9, what is the leading reactive KVA supplied by the motor and at what p.f is it working.	Apply	6
9	A 3 phase substation transformer has a name plate rating of 7000 KVA and a thermal capability of 125% of the name plate rating. If the connected load is is 1150 KVA with a 0.8 of lag p.f determine the following a. The KVAR rating of the shunt capacitor tank required to decrease the KVA load of the transformer to its capability level b. The power factor of the corrected level.	Apply	6
10	A 400 V 50 cycles three phase line delivers 207KW at 0.8 p.f lag. It is desired to bring the line p.f to unity by installing shunt capacitors, calculate the capacitance if they are i. star connected ii.delta connected	Evaluate	6
	UNIT –VIII		
1	Discuss about any two methods of voltage control.	Analyze	6
2	Discuss the way to improve the distribution system overall voltage regulation	Analyze	6
3	How to do the shunt capacitor and reactors control the voltage.	Analyze	6
4	Discuss the methods to calculate the voltage dips due to fluctuations in distribution systems.	remembering	6
5	With the help of a phasor diagram, show how a series capacitor boosts the voltage. what are the drawbacks of this method?	Analyze	6
6	Discuss the effect of AVR on voltage control.	Analyze	7