EE8602 Protection and Switchgear

Unit I - Protection Schemes				
Principles and need for protective schemes–nature and causes of faults–types of faults–Methods of Grounding-Zones of protection and essential qualities of protection–Protection scheme				
PART - A				
Q.No	**Questions**	**Course Outcome**	**BT Level**	**Competence**
1	Show the need for protective schemes in power system?	CO1	BTL 1	Remember
2	Differentiate between a short circuit and an overload.	CO1	BTL 1	Remember
3	Summarize the role of protective relay in a modern power	CO1	BTL 5	Evaluate
4	Define switchgear.	CO1	BTL 1	Remember
5	What are the causes of faults in a power system?	CO1	BTL 1	Remember
6	Summarize the functions of isolating switch?	CO1	BTL 5	Evaluate
7	Explain surge absorber? Differentiate it from surge diverter?	CO1	BTL 4	Analyze
8	Identify the sources of fault power?	CO1	BTL 1	Remember
9	Identify the different types of faults occurring in power system?	CO1	BTL 1	Remember
10	Give the consequences of short circuit.	CO1	BTL 4	Analyze
11	Explain the importance of ground wire?	CO1	BTL 2	Understand
12	List the merits of resistance grounded system.	CO1	BTL 4	Analyze
13	Analyze how arcing ground avoided can be avoided?	CO1	BTL 2	Understand
14	What happen if earth wire is not provided in overhead	CO1	BTL 6	Create
15	Classify the different types of earthing.	CO1	BTL 2	Understand
16	What is the necessity for earthing?	CO1	BTL 3	Apply
17	What is primary protection?	CO1	BTL 6	Create
18	Define protection zone.	CO1	BTL 6	Create
19	Classify the different types of zones of protection.	CO1	BTL 1	Remember
20	Show the examples for unit and non unit system of protection.	CO1	BTL 2	Understand
PART – B				
1	(i) Summarize the importance of protective schemes employed in power system. (7) (ii) Show the essential qualities of protection. (6)	CO1	BTL 6,3	Apply Create

2	What are the different types of faults? Discuss the consequence of faults on a power system (13)	CO1	BTL 4	Analyze
3	List the causes of faults in different equipment's in a sample system (13)	CO1	BTL 2	Understand
4	Explain in detail about the various methods of overvoltage protection of overhead transmission line. (13)	CO1	BTL 4	Analyze
5	Explain in detail about the need and different methods for neutral grounding with suitable diagram. (13)	CO1	BTL 3	Apply
6	(i) Explain different types of earthing the neutral point of the power system (7) (ii) Formulate an expression for the reactance of the Peterson coil in terms of capacitance of the protected line. (6)	CO1	BTL 4,6	Analyze Create
7	Describe in detail about the Peterson coil? List the protective functions performed by this device. (13)	CO1	BTL 1	Remember
8	A 132 kV, 3-phase, 50 Hz transmission line 200 km long consists of three conductors of effective diameter 20 mm arranged in a vertical plane with 4 m spacing and regularly transposed. Find the inductance and kVA rating of the arc suppression coil in the system (13)	CO1	BTL 3	Apply
9	(i) Explain the overlapping of protective zones with neat sketch. (7) (ii) Describe the different faults in power system. Which of these are more frequents? (6)	CO1	BTL 5,1	Remember Evaluate
10	(i) Describe the fundamental requirements of protective Relaying. (7) (ii) Differentiate between surge diverter and surge absorber. Also explain the characteristics of an ideal surge diverter. (6)	CO1	BTL 1,2	Remember Understand
11	(i)List the causes of over voltage? (4) (ii)Describe the protection scheme employed to protect from lighting and switching effects. (9)	CO1	BTL 1,1	Remember
12	(i) List the causes of short circuits due to failure of insulation on overhead conductors? (4) (ii) Briefly explain about resistance earthing and reactance earthing. (9)	CO1	BTL 1,4	Remember Analyze
13	A 230 kV, 3-phase, 50 Hz, 200 km transmission line has a capacitance to earth of 0.02 μF/km per phase. Calculate the inductance and kVA rating of the Peterson coil used for earthing the above system (13)	CO1	BTL 3	Apply

14	(i) Draw and explain protective zone diagram for a sample power system networks. (7) (ii)List the causes of faults in different equipment's in a sample system (6)	CO1	BTL 5,3	Evaluate Apply
	PART - C			
1	Why protection scheme is required in power system with suitable example. (1 5)	CO1	BTL 4	Analyze
2	Explain different types of protection schemes with suitable diagrams. (15)	CO1	BTL 5	Evaluate
3	Why neutral grounding is provided and compare different types of neutral grounding (15)	CO1	BTL 4	Analyze
4	Determine the inductance of Peterson coil to be connected between the neutral and ground to neutralize the charging current of overhead line having the line to ground capacitance of 0.15μF. If the supply frequency is 50 HZ and the operating voltage is 132KV. Find the KVA rating of the coil. (15)	CO1	BTL 5	Evaluate

Unit II - Electromagnetic Relays

Operating principles of relays-the Universal relay–Torque equation–R-X diagram–Electromagnetic Relays–Over current, Directional, Distance, Differential, Negative sequence and Under frequency relays.

PART - A

Q.No	Questions	Course Outcome	BT Level	Competence
1	List the basic requirements of protective relay	CO2	BTL 1	Remember
2	Summarize the functions of protective relays.	CO2	BTL 5	Evaluate
3	Show the different types of electromagnetic relays?	CO2	BTL 3	Apply
4	Identify the applications of attracted armature type	CO2	BTL 1	Remember
5	Define time setting multiplier in protective relays.	CO2	BTL 1	Remember
6	What is time graded relay	CO2	BTL 5	Evaluate
7	Discuss the effects of arc resistance?	CO2	BTL 2	Understand
8	Discuss R-X diagram?	CO2	BTL 2	Understand
9	Why shading ring is provided in and induction disc relay	CO2	BTL 2	Understand
10	What are the applications of over current relay?	CO2	BTL 1	Remember
11	In what way a distance relay is superior to over current protection for protection of transmission line. Justify	CO2	BTL 6	Create
12	List the different types of distance relay.	CO2	BTL 1	Remember
13	Show the merits of mho relay? And also draw its R-X Diagram.	CO2	BTL 3	Apply
14	Explain the principle of differential relay.	CO2	BTL 4	Analyze
15	What are the conditions under which the directional impedance relay will act?	CO2	BTL 1	Remember
16	Give the principle of negative sequence relay.	CO2	BTL 2	Understand
17	Mention the principle of operation of distance relay..	CO2	BTL 4	Analyze
18	Give the function of under frequency relay.	CO2	BTL 2	Understand
19	What are the applications of differential relay?	CO2	BTL 1	Remember
20	Show which type of relay is best suited for long distance very high voltage transmission lines.	CO2	BTL 3	Apply

PART – B

1	Develop the different inverse time characteristics of over current relays and mention how the characteristics can be achieved in practice for an EM relay? (13)	CO2	BTL 6	Create
2	Explain the general working of a relay and derive the fundamental torque equation. (13)	CO2	BTL 4	Analyze
3	Discuss the construction details and principle of operation of induction type directional over current relay. (13)	CO2	BTL 2	Understand
4	Discuss the construction and principle of operation of non- directional induction-disc relay. (13)	CO2	BTL 2	Understand

5	Determine plug setting multiplier of a 5 ampere,3 second over current relay having a current setting of 125% and a time setting multiplier of 0.6 connected to supply circuit through a 400/5 current transformer when the circuit carries a fault current of 4000Athrough a 400/5 current transformer when the circuit carries a fault current of 4000A . (13)	CO2	BTL 2	Understand
6	Describe the operating principle, constructional features and area of applications of directional relay. How do you implement directional feature in the over current relay. (13)	CO2	BTL 1	Remember
7	(i) Explain the construction details and principle of operation o f directional induction cup relay. (7) (ii) Explain with the help of neat diagram the construction and working of induction type directional power relay. (6)	CO2	BTL 4,4	Analyze
8	Show the MHO relay characteristic on the R-X diagram. Discuss the range setting of various distance relays placed on a particular location . (13)	CO2	BTL 3	Apply
9	Show in what way distance protection is superior to over current protection for the protection of transmission line. (13)	CO2	BTL 3	Apply
10	Explain the principle of working of distance relays. Describe with neat sketches the following types of relay (i) Impedance relay (ii) Reactance relay (iii) Mho relay Indicate the difference on RX diagrams and show where each type is suitable. (4+4+5)	CO2	BTL 5	Evaluate
11	Describe the operating principles and characteristic of impedance, admittance and mho relays. (13)	CO2	BTL 1	Remember
12	Describe the principle of percentage biased differentia relay with necessary diagrams. Also discuss its applications. (13)	CO2	BTL 1	Remember
13	Explain with suitable diagram the principle of working of transley relay. (13)	CO2	BTL 3	Apply
14	(i) With neat sketch explain negative sequence relay (7) (ii) Explain clearly about current balance differential relays. (6)	CO2	BTL 4,4	Analyze
	PART - C			
1	With neat diagram explain the various types of electromagnetic relays. (15)	CO2	BTL 4	Analyze
2	Describe the construction and principle of operation of non directional induction type over current relay. (15)	CO2	BTL 5	Evaluate
3	Explain impedance relay with suitable R-X diagrams (15)	CO2	BTL 5	Evaluate
4	Derive the torque equation of mho relay from universal torque equation. (15)	CO2	BTL 4	Analyze

Unit III - Apparatus Protection

Current transformers and Potential transformers and their applications in protection schemes-Protection of transformer, generator, motor, bus bars and transmission line.

PART - A

Q.No	Questions	Course Outcome	BT Level	Competence
1	Justify, Why secondary of transformer should not be opened?	CO3	BTL 6	Create
2	For a 132KV system, the reactance and capacitance up to the location of circuit breaker is 3Ω and 0.015μf respectively the frequency of oscillation?	CO3	BTL 1	Remember
3	Mention the difference between CTs used for protection	CO3	BTL 4	Analyze
4	Define the term burden on CT.	CO3	BTL 1	Remember
5	List the application of potential transformer.	CO3	BTL 1	Remember
6	Discuss the short comings of differential protection scheme as applied to power transformer.	CO3	BTL 2	Understand
7	Define the term pilot with reference to power line	CO3	BTL 1	Remember
8	Show the applications of Buchholz's relay.	CO3	BTL 3	Apply
9	Identify the problems arising in differential protection in power transformer and how are they overcome?	CO3	BTL 1	Remember
10	Explain current grading of relays?	CO3	BTL 5	Evaluate
11	Explain over fluxing protection of a transformer?	CO3	BTL 4	Analyze
12	List the common faults that occur in a generator	CO3	BTL 1	Remember
13	Discuss the causes of over speed and how alternators are protected from it?	CO3	BTL 2	Understand
14	Discuss the type of relay is best suited for generation	CO3	BTL 2	Understand
15	What are the protection methods used for transmission line?	CO3	BTL 3	Apply
16	Explain the secondary of CT should not be open.	CO3	BTL 4	Analyze
17	Discuss the type of relays are used to protect transmission	CO3	BTL 2	Understand
18	Compose the common methods used for line protection?	CO3	BTL 6	Create
19	Classify the types of bus bar protection.	CO3	BTL 3	Apply
20	Explain time-graded system protection?	CO3	BTL 5	Evaluate

PART - B

1	(i) Compare CT & PT. What are the applications of CT & PT. (7) (ii) An 11 kV, 200MVA alternator is provided with differential protection. The % of winding to be protected against phase to ground fault is 85 %.The relay is set to operate when there is 20% out of balance current. Determine the value of the resistance to be placed in the neutral to ground connection. (6)	CO3	BTL 5	Evaluate
2	A 3 phase transformer having line voltage ratio of 0.4 kV/11 kV is connected in star delta and protective transformer on 400 v side have a current ratio of 500/5.what must be the ratio of the protective transformer on the 11kV side? (13)	CO3	BTL 2	Understand
3	Classify different protection schemes normally used for protection of a power transformer from internal faults? Discuss one of them in brief. (13)	CO3	BTL 4	Analyze
4	(i) Explain the Merz-price circulation current scheme of protection used for power transformer. (7) (ii) A three phase transformer of 220/11000 line volts is connected in star/delta. The protective transformers on 220V side have a current ratio of 600/5. Calculate the current transformer ratio on 11000V side. (6)	CO3	BTL 4,3	Analyze Apply
5	A 3 phase transformer having line voltage ratio of 440 V / 11 kV is connected in star – delta. The protection transformer on the LV side has a ratio of 500 / 5. Estimate the ratio of the protection transformer connected on HV side? (13)	CO3	BTL 2	Understand
6	(i) Describe the differential protective scheme of transformer. (7) (ii) Show the protective scheme employed for the bus bar. (6)	CO3	BTL 1,3	Remember Apply
7	(i) Describe clearly about Buchholz relay for the protection of incipient faults in transformers (7) (ii) A star connected, 3 phase, 10 MVA, 6.6KV alternator has a per phase reactance of 10%. It is protected by Merz- price circulating current principle which is set to operate for fault currents not less than 175A. Calculate the value of earthing resistance to be provided in order to ensure that only 10% of the alternator winding remains unprotected. (6)	CO3	BTL 1,4	Remember Analyze
8	Discuss the principle of percentage biased differential protection with necessary diagrams. Also discuss its applications (13)	CO3	BTL 2	Understand
9	Describe the differential pilot wire method of protection of feeder (13)	CO3	BTL 3	Apply

10	A star connected 3-phase,20MVA,11KV Alternator has a per phase reactance of 0.75 ohms/phase .It is protected by Merz price circulating current principle which is to operate for fault currents not less than 175A. Formulate the value of earthing resistance to be provided in order to ensure only 10% of the alternator winding remains unprotected (13)	CO3	BTL 6	Create
11	Describe the types of protective schemes employed for the protection of field winding and loss excitation of alternator. (13)	CO3	BTL 1	Remember
12	Describe the types of protective schemes employed for the protection of Busbar. (13)	CO3	BTL 1	Remember
13	Explain the types of protective schemes employed for the protection of Transmission line. (13)	CO3	BTL 4	Analyze
14	Show the different types of feeder and the protective schemes employed for the protection of feeder (13)	CO3	BTL 3	Apply
	PART - C			
1	Give a brief account on the protection of generator using differential and biased differential protection scheme. (15)	CO3	BTL 4	Analyze
2	Give a brief account on the faults and protection of transformer. (15)	CO3	BTL 4	Analyze
3	A star connected 3 phase, 12 MVA, 11 KV alternator has a phase reactance of 10%. It is protected by Merz-price circulating current scheme which is set to operate for fault current not less than 200A. Calculate the value of earthing resistance to be provided in order to ensure that only 15% of the alternator winding remains unprotected. (15)	CO3	BTL 5	Evaluate
4	A 500 KVA, 6.6 KV star connected alternators has a synchronous reactance of 1.0Ω per phase and negligible resistance. The different relay operates if the out of balance current through it exceeds 30% of the normal full load current of the alternator. The star point of the alternator is earthed through a resistance of 5Ω. What percent of the stator winding is left unprotected? Show that the effect of the alternator reactance can be neglected. (15)	CO3	BTL 5	Evaluate

Unit IV - Static Relays and Numerical Protection				
Static relays–Phase, Amplitude Comparators–Synthesis of various relays using Static comparators–Block diagram of Numerical relays–Over current protection, transformer differential protection, distant protection of transmission lines.				
PART - A				
Q.No	**Questions**	**Course Outcome**	**BT Level**	**Competence**
1	What are the basic circuits used in static relays?	CO4	BTL-6	Create
2	Give the advantages of static relays	CO4	BTL-2	Understand
3	Compose the problems arising in differential protection in power transformer and how are they overcome?	CO4	BTL-6	Apply
4	Show the Duality between Amplitude and Phase Comparators	CO4	BTL-1	Remember
5	Explain Comparator and its type	CO4	BTL-1	Remember
6	Explain the function of Synthesis of Mho Relay Using Static Phase Comparator	CO4	BTL-1	Remember
7	Define static relay	CO4	BTL-4	Analyze
8	Explain the function of Synthesis of Simple Impedance Relay using Amplitude Comparator	CO4	BTL-5	Evaluate
9	Define Amplitude Comparator and Phase Comparator	CO4	BTL-2	Understand
10	Distinguish the Synthesis of Various Distance Relays Comparators	CO4	BTL-3	Apply
11	List out the general characteristics of numerical protection.	CO4	BTL-1	Remember
12	Define the Over Current Protection	CO4	BTL-4	Analyze
13	Give the Different over current protection relays	CO4	BTL-4	Analyze
14	Define the definite time over-current relay	CO4	BTL-3	Apply
15	Define the Inverse Time Over-current Relay	CO4	BTL-1	Remember
16	Define the Instantaneous OC Relay	CO4	BTL-2	Understand
17	Compose the advantages of over current relays over electromagnetic types	CO4	BTL-2	Understand
18	Explain the Phase Comparators and write its type	CO4	BTL-5	Evaluate
19	Illustrate with neat Block diagram of Numerical Transformer Differential Protection	CO4	BTL-3	Apply
20	List the different methods of Numerical distant protection of transmission lines	CO4	BTL-1	Remember
PART - B				
1	Describe the construction, working principle and operation of static over current relay. (13)	CO4	BTL-1	Remember

2	i) Define the Duality Between Amplitude and Phase Comparators. (7) ii) Define the type of Amplitude and Phase Comparators (6)	CO4	BTL-4	Analyze
3	Discuss the Synthesis of Various Distance Relays Using Static Comparators (13)	CO4	BTL-6	Create
4	Explain with neat block diagram of the function of Synthesis of Mho Relay Using Static Phase Comparator (13)	CO4	BTL-1	Remember
5	Explain with neat block diagram of the function of Synthesis of Reactance Relay Using Cosine-type Phase Comparator (13)	CO4	BTL-3	Apply
6	Distinguish briefly about the Phase Comparators and write its Types (13)	CO4	BTL-4	Analyze
7	i) Compare static relay with electromagnetic relays. (7) ii) Explain the advantages of Numerical relays. (6)	CO4	BTL-4	Analyze
8	Compose the problems arising in differential protection in power transformer and how are they overcome? (13)	CO4	BTL-2	Understand
9	Explain with neat block diagram of the function of Synthesis of Simple Impedance Relay Using Amplitude Comparator (13)	CO4	BTL-1	Remember
10	Discuss the various semiconductor devices used in the static relay. (13)	CO4	BTL-2	Understand
11	Illustrate with neat Block diagram of Numerical Transformer Differential Protection (13)	CO4	BTL-2	Understand
12	Discuss with Neat Block diagram of different methods of Numerical Distance Protection of Transmission Line.(13)	CO4	BTL-1	Remember
13	Define the Over Current Protection and Explain its types Briefly (13)	CO4	BTL-3	Apply
14	Define i) definite time over-current relay (7) ii) Inverse Time Over-current Relay (6)	CO4	BTL-5	Evaluate
PART - C				
1	Explain with neat block diagram the operation of static relay and list the advantages and disadvantages (15)	CO4	BTL-4	Analyze
2	Assess the factors cause spill current on external fault in case of transformer Differential protection? (15)	CO4	BTL-5	Evaluate
3	Discuss the coincidence principle used in phase comparators. (15)	CO4	BTL-4	Analyze
4	Derive the characteristics equation for the phase comparator and amplitude comparator. (15)	CO4	BTL-5	Evaluate

Unit V - Circuit Breakers

Physics of arcing phenomenon and arc interruption-DC and AC circuit breaking–re-striking voltage and recovery voltage-rate of rise of recovery voltage-resistance switching-current chopping-interruption of capacitive current-Types of circuit breakers–air blast, air break, oil,SF6, MCBs, MCCBs and vacuum circuit breakers–comparison of different circuit breakers–Rating and selection of Circuit breakers.

PART - A

Q.No	Questions	Course Outcome	BT Level	Competence
1	What is meant by MCB?	CO5	BTL-1	Remember
2	Differentiate A.C. and D.C. circuit breaking	CO5	BTL-2	Understand
3	Discuss the arc phenomenon in a circuit breaker.	CO5	BTL-6	Apply
4	State the slepian theory for arc interruption.	CO5	BTL-1	Remember
5	Define the term “rate of rise of recovery voltage”.	CO5	BTL-1	Remember
6	Explain recovery voltage?	CO5	BTL-1	Remember
7	Explain resistance switching	CO5	BTL-4	Analyze
8	Explain current chopping	CO5	BTL-5	Evaluate
9	What are the factors responsible for the increase of arc resistance?	CO5	BTL-2	Understand
10	Discuss the different methods of arc extinction	CO5	BTL-3	Apply
11	Define restriking voltage.	CO5	BTL-4	Analyze
12	Assess the problems encountered in the interruption of capacitive currents	CO5	BTL-3	Apply
13	Explain the ratings of a circuit breaker	CO5	BTL-4	Analyze
14	Define symmetrical breaking capacity	CO5	BTL-3	Apply
15	Show the making capacity of a circuit breaker	CO5	BTL-1	Remember
16	Classify the circuit breakers	CO5	BTL-2	Understand
17	A circuit breaker is rated as 1500 A, 1000 MVA, 3 second, 3 phase oil circuit breaker. Find rated making current.	CO5	BTL-6	Create
18	Give the advantage of SF6 circuit breaker over Air blast circuit breaker	CO5	BTL-5	Evaluate
19	Compose Peterson coil? What protective functions are performed by this device?	CO5	BTL-2	Understand
20	Illustrate the disadvantages of an Air blast circuit breaker	CO5	BTL-1	Remember

PART - B

1	Define the principle of arc extinction. What are the methods of arc extinction? Describe them in detail. (13)	CO5	BTL-1	Remember

2	i) Explain the arc interruption methods used in circuit breakers (7) ii) Explain Resistance switching for arc extinction in circuit breakers (6)	CO5	BTL-4	Analyze
3	Give the reason of using SF_6 circuit breaker. (13)	CO5	BTL-6	Create
4	i) Explain how arc initiated and sustained when the circuit breaker contacts break (7) ii) Explain in detail the various methods of arc extinction in circuit breaker (6)	CO5	BTL-3	Apply
5	i) Show an expression for Restriking voltage and rate of rise of restriking voltage (RRRV) in a C.B. (7) ii) Illustrate the current chopping? Explain how can the effect of current chopping be minimized? (6)	CO5	BTL-3	Apply
6	Describe the construction and principle of operation of AIR Blast circuit breaker. (13)	CO5	BTL-4	Analyze
7	i) With neat sketch explain resistance switching. (7) ii) Explain current chopping with suitable diagrams. (6)	CO5	BTL-4	Analyze
8	Discuss with neat sketch, the construction and working of minimum oil circuit breaker. Also gives its merits and demerits. (13)	CO5	BTL-2	Understand
9	Describe the constructional details of SF6 circuit breaker and its operation. Give its advantages and disadvantages (13)	CO5	BTL-1	Remember
10	A 50 Hz, 11 KV, 3 phase alternator with earthed neutral has a reactance of 5 ohms per phase and is connected to bus bar through a CB. The distributed capacitance up to CB between phase and neutral is 0.01µf.determine (i) peak restriking voltage across the contacts of the breaker. (ii) Frequency of oscillation. (iii) The average rate of rise of re striking voltage up to the first peak. (5+4+4)	CO5	BTL-1	Remember
11	Describe the principle constructional features of all types of air blast CB. Give its advantages and disadvantages. (13)	CO5	BTL-2	Understand
12	Explain the construction, working principle, operation and application of Vaccum circuit breakers. (13)	CO5	BTL-1	Remember
13	Explain rupturing capacity, making capacity and short time rating and rated current of the circuit breaker. (13)	CO5	BTL-2	Understand
14	Explain working principle and construction of MCB and MCCB (13)	CO5	BTL-5	Evaluate
PART – C				

1	i) Solve the RRRV of 132 kV circuit breaker with neutral earthed circuit breaker data as: broken current is symmetrical, restriking voltage has frequency of 20 kHz, and power factor is 0.15. Assume fault is also earthed. (7) ii) Illustrate the selection of circuit breakers for different ranges of system voltages (8)	CO5	BTL-5	Evaluate
2	A generator connected through 5 cycle CB to a transformer is rated 8000KVA with the reactance of X''_d=10 % , X''_d=16% and X_d=100%. It is operating at no load and rated voltage when 3 phase short circuit occurs between breaker and transformer. Find i) Sustained short circuit in circuit breaker ii) The initial symmetrical r.m.s current in breaker iii) Maximum possible D.C component of short circuit in breaker iv) The momentary current rating of breaker v) Current to be interrupted by breaker vi) The interrupting KVA (15)	CO5	BTL-5	Evaluate
3	Compare the different types of circuit Breaker used for power system protection (15)	CO5	BTL 4	Analyze
4	What are the different methods of testing of circuit breaker? Describe the method which is more suitable for testing the large capacity circuit breakers. Also discuss the merits and demerits of the method. (15)	CO5	BTL 4	Analyze