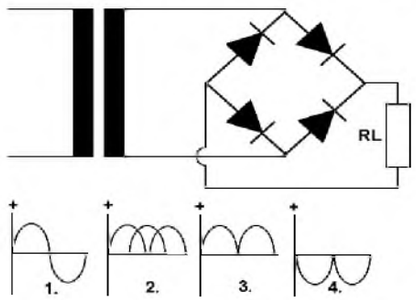
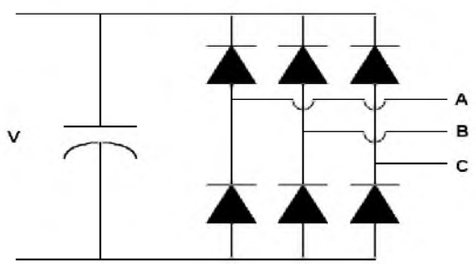
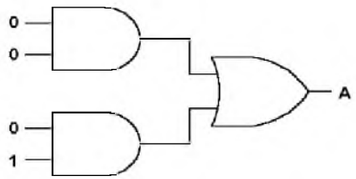
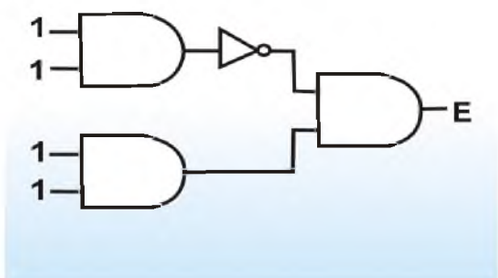
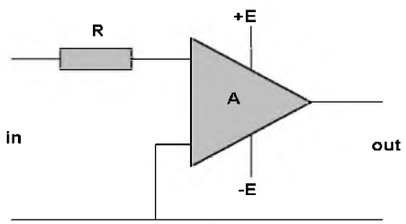
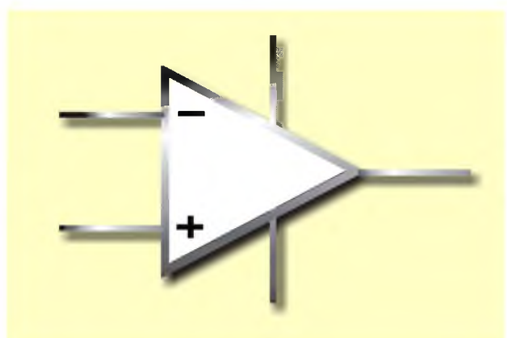
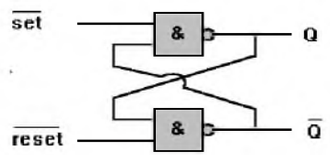
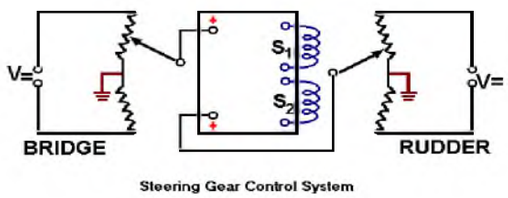
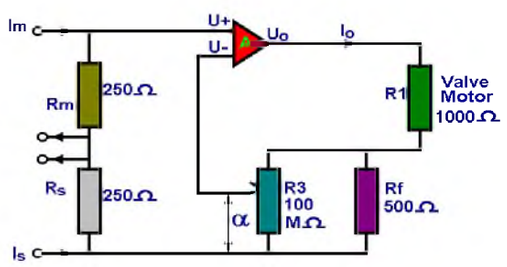
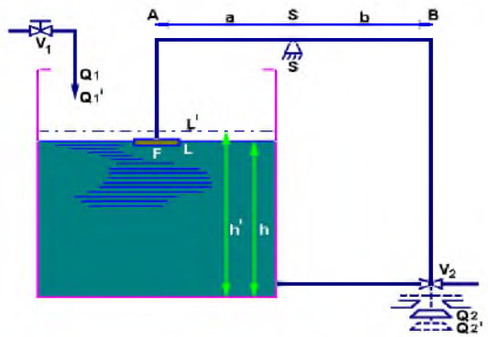
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
1	From the sample diagrams shown, choose the correct voltage waveform measured across the load.		1	2	3	4
2	What is the function of the circuit shown here ?		DC to AC voltage converter.	Three phase rectifier.	Three phase AC converter.	Three phase oscillator.

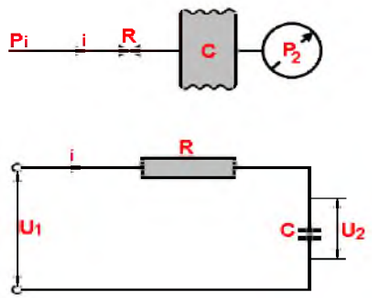
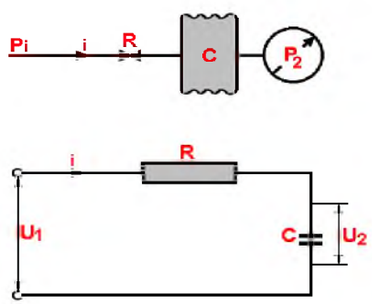
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
3	What will be the binary output at A ?		1	0	11	10
4	What will be the binary output at E ?		1	0	10	11

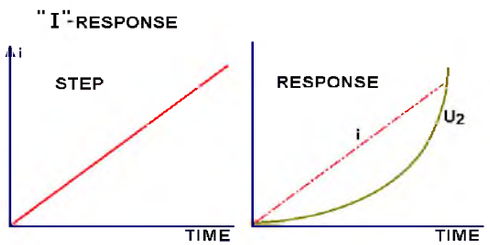
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
5	Indicate the correct characteristic of the amplifier "A".		An input impedance lower than 1,000 Ohm	A voltage gain greater than 100,000	An output impedance greater than 10,000 Ohm	A frequency range less than 1kHz
6	An ideal operational amplifier is characterised by.....		infinite input impedance.	infinite output impedance.	limited bandwidth.	limited open loop voltage gain.

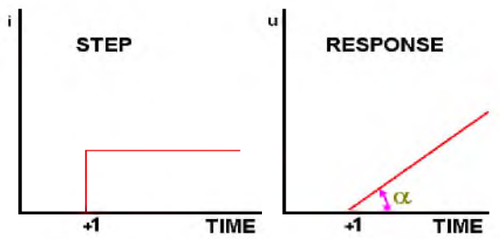
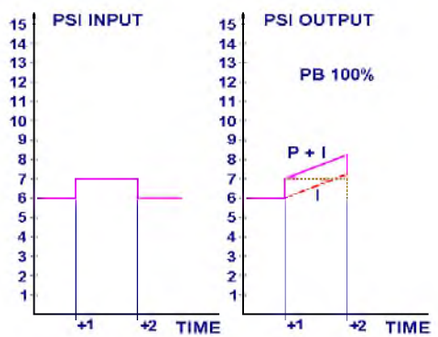
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
7	What does this symbol represent?		A differential trigger.	A binary register.	A binary flip-flop.	A digital amplifier.
8	What is a high-pass filter ?		A circuit that will only pass a high voltage.	A circuit that blocks a high voltage.	A circuit that will limit resistance.	A circuit that will only pass high frequency signals.
9	Which of these formulas is used to calculate capacitive reactance (Xc) ?	A $2\pi f C$ B $\frac{1}{2\pi f C}$ C $\frac{1}{2\pi f L}$ D $\frac{1}{2\pi f X}$	A	B	C	D

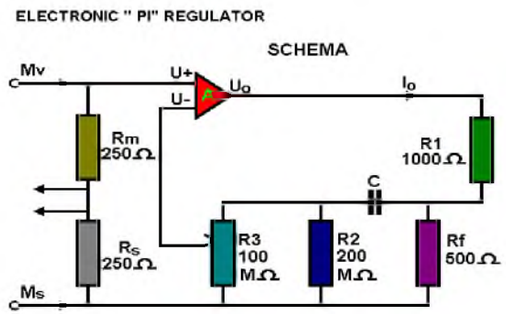
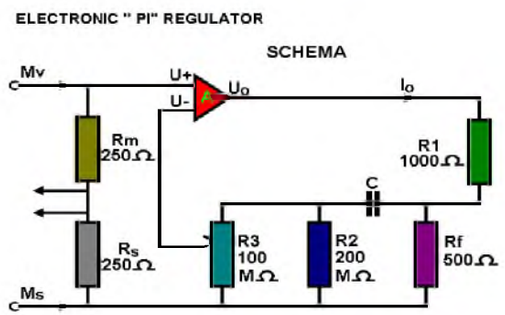
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
10	The second potentiometer of this electric command system is located in the steering gear. What moves this potentiometer ?	 Steering Gear Control System	The telemotor.	The rudder angle indicator.	The rudder position via the trunion connection.	The eccentric pushrod on the HELE-SHAW pump.
11	How is the set pressure (opening pressure) adjusted on the cylinder head safety valve of a diesel engine?		By adjusting the distance of the valve cone.	By adjusting the lift height of the spindle.	By fitting distance washers.	By adjusting the spring pressure.
12	What control equipment drawing is shown here ?		An electric P-controller.	An electric differentiating amplifier.	An electric temperature measurement scanner.	An electric pressure transmitter system.

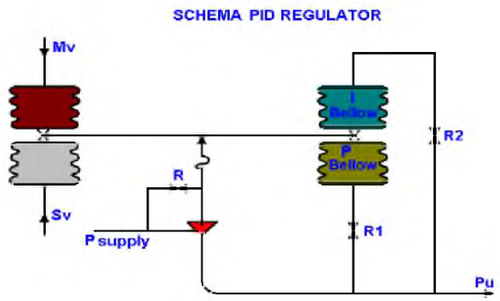
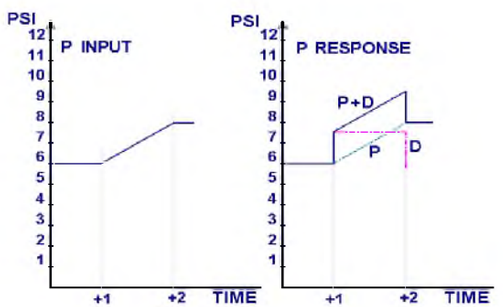
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
13	Here 'S' is the support point in the middle of pivoting arm 'AB'. For a given increase in water level the valve is opened by the same distance, therefore the amplification is 1. What will happen if b = 2 x a ?		The water will drop twice as fast in the tank	The valve will open twice the distance of the increased level	The amplification is increased by 50 %	The process will not longer working
14	A six-pole asynchronous motor is connected to a power supply with a frequency of 50 Hz. If the rotor bar frequency is 2.3 Hz, what will be the speed of the motor ?		972 RPM	954 RPM	928 RPM	912 RPM
15	A six pole asynchronous motor is fed from a 60 Hz circuit and has a slip of 5 %. What is the motor speed ?		1720 RPM	1560 RPM	1140 RPM	960 RPM
16	A star connected induction motor operates on 220 V with power factor 0.7 and efficiency of 82 %. Its output is 8 HP. What is the phase, current and voltage?		I phase is 12.8 Ampere , phase voltage is 220 Volt.	I phase is 27.3 Ampere, phase voltage is 127 Volt.	I phase is 15.8 Ampere, phase voltage is 220 Volt.	I phase is 22.7 Ampere, phase voltage is 127 Volt.
17	A 3-phase 60 cycle motor delivers 50 HP to a pump (shaft output). What is the torque if the RPM is 1176 RPM ?		223 pound-feet	175 pound-feet	275 pound-feet	250 pound-feet

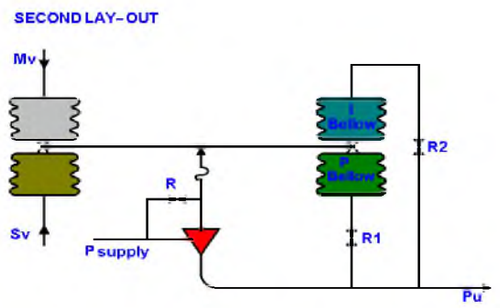
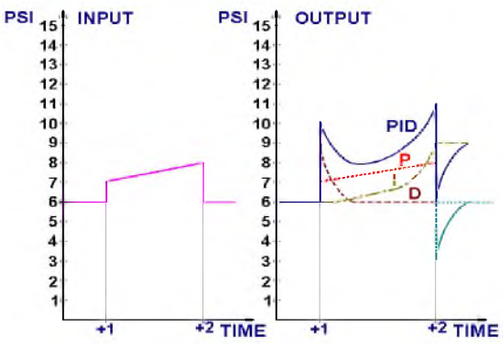
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
	OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT					
18	In these integrator circuits the air flow through the restrictor and the current through the resistance		remains constant.	decreases with time.	increases with time.	is negative.
19	What is the difference in function between these electrical and the pneumatic integrators ?		None	The pneumatic integrator is slower	The electric integrator is slower	They work in opposite directions
20	The size of any electrical conductor should be such that in practice, the voltage drop at full load will not exceed		1%	2%	3%	5%
21	Two 3 phase 4160 Volt, 60 Hz alternators are operated in parallel. The total load of the system is 1050 kW with power factor 0.75 lagging. If alternator No 1 is carrying 700 kW at 80 % power factor lagging		the Power Factor of alternator No 2 is lagging 0.7352.	the Power Factor of alternator No 2 is lagging 0.7064.	the Power Factor of alternator No 2 is lagging 0.6914.	the Power Factor of alternator No 2 is lagging 0.658.

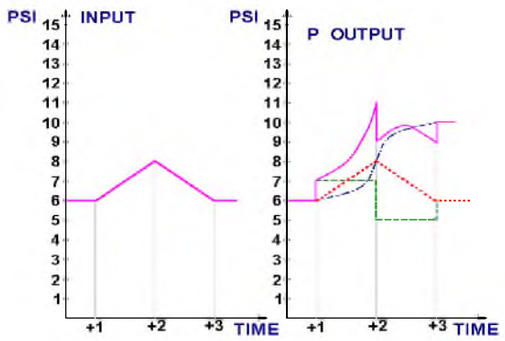
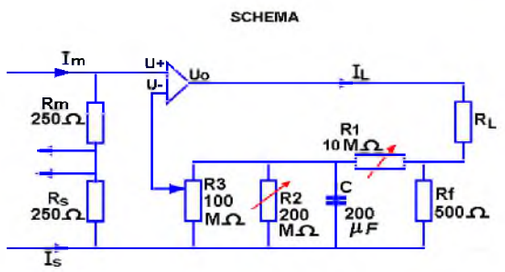
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
22	Alternator (A) 100 kVA runs parallel with alternator (B) 125 kVA, both are 3 phase, 240 V, 60 Hz. The load of A is 60 kW, 90% power factor and the load of B is 80 kW, 70 % power factor. What is the total load ?		472.8 Amps	458.8 Amps	429.8 Amps	416.8 Amps
23	The pick up and the time settings of reverse power relays are adjustable. If the prime mover of the alternator is a steam turbine what is the trip level setting ?		0.5 - 1 %	2 - 3 %	4 - 6 %	6 - 7 %
24	If the prime mover of an alternator is a diesel engine, what should the Reverse Power Relay's pick up setting be ?		5 - 10 %	10 - 15 %	8 - 10 %	5 - 12 %
25	The characteristics shown here indicate a ramp input on the left together with the corresponding output on the right of		a proportional controller.	a pure integrator.	a pure differentiator.	a proportional integrating controller.

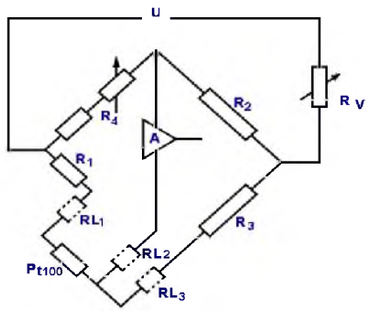
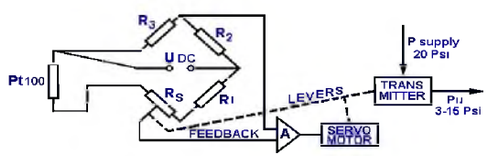
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
26	These graphs are, left, the step input and, right, the output response of a controller. What characteristics are shown ?		The controller response output characteristics.	The integrator characteristics.	The PI characteristics.	The integrator differential characteristics.
27	For which type of controller are the input and output characteristics shown here ?		A pressure indicating controller.	A proportional integrating controller.	A PI differentiating controller.	A pneumatic indicating controller.

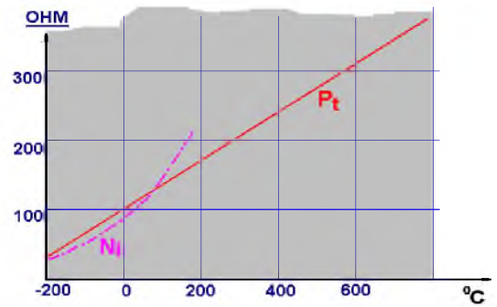
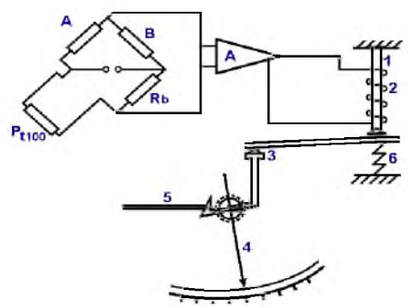
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
28	In this drawing, the triangle marked "A" represents		an operational amplifier.	an ampere-differential transmitter.	an analog converter.	a current converter.
29	Which resistor determines the proportional band on this electronic proportional integrating controller ?		Rf	R1	R2	R3

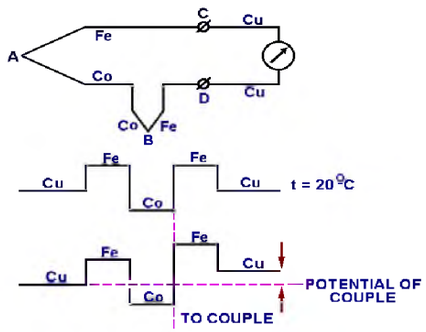
GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
30	Fitting a restriction R1 in the supply to the proportional feedback of this PID controller ensures that for an initial small variation on the input, the initial response on the output will be		zero.	very weak.	proportional.	strong.
31	For which control instrument are these the input (left) and the output or response (right) characteristics ?		A pressure differentiator.	A proportional differentiating controller.	A pressure controlling data register.	A pneumatic differentiating controller.

GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
32	For this PID controller to act only as a P (proportional) controller, what should be the arrangement of restricting valves R1 and R2 ?		R1 fully open, R2 closed	R1 fully open, R2 fully open	R1 closed, R2 closed	R1 closed, R2 fully open
33	For which kind of controller are the input and output characteristics shown here ?		A pressure indicating controller	A proportional integrating-differentiating controller	A proportional indicating differentiator	A pneumatic differential summator

GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
34	In the output characteristics (right) of this controller, which response lines are clearly shown ?		The output, variation and differentiation.	The proportional output, offset and integration.	The proportional, integration and differentiation.	The proportional, variation and integration.
35	How is the differentiating action of this PID controller obtained ?		By C and R1	By C and R2	By C and R3	By C and RL

GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
36	The three conductor system used by Wheatstone Bridge lay-outs is intended to provide		compensation for changing conductor resistance by changing temperature.	zero setting at all times by variable resistances to be measured.	balancing of the bridge by very high or very low temperatures.	conversion of an electrical signal into a pneumatic signal.
37	The function of this measuring system is to		convert a digital signal into a pressure.	convert an electric temperature measurement into a pneumatic signal.	convert Wheatstone Bridge readings into remote pressure readings.	convert Field Effect Transistor readings into a temperature reading.

GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
38	The resistance characteristic of Platinum is linear. The resistance characteristic of Nickel is non-linear. How can the characteristic of Nickel be made linear ?		By using a three-wire system Wheatstone Bridge	By fitting a compensation cable	By fitting another resistance in parallel	By fitting another resistance in series
39	Item No 2 of this Wheatstone Bridge is		the field wire fed by amplifier A	the feed-back coil fed by amplifier A	the field balance indicating field wire of amplifier output	the thermal resistance fed by the output of amplifier A

GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
40	The potential of this thermocouple bridge is zero if all connections are kept at the same temperature. Why is the indication of the potentiometer zero ?		Because of the second balancing couple B.	Because of the copper (Cu) calibration wiring connected to C and D.	Because A and B couples are opposed.	Because the connections in A and B and in C and D are opposed
41	Why are high-value resistors installed across the terminals of high voltage capacitors?		To prevent condensation and arcing.	To drain the charge and reduce shock hazards.	To stabilize the output voltage and current.	To absorb transient high currents.
42	Which type of motor behaves as though it were a transformer; (the primary is the stationary winding, and the secondary is the rotating element)?		A 3-phase synchronous motor.	A shunt-wound DC motor.	A compound-wound DC motor.	A 3-phase induction motor.
43	An induction motor operating in a "no load" condition has...		a very high power factor.	a very low power factor.	very high slip.	a very low stator voltage.
44	If capacitive reactance is greater than inductive reactance then...		the power factor will be unity.	the voltage will lead the current.	the current will lead the voltage.	none of the other answers will apply.
45	The rotational speed (rpm) of a 3-phase squirrel-cage induction motor is varied by...		changing stator winding connections from delta to star.	connecting a variable resistance in the rotor windings.	shunting the stator windings with a 3-phase impedance.	varying the frequency of the applied input voltage.
46	A DC shunt generator is running at normal speed. If the field resistance is increased, what happens to the generated output voltage?		Remains the same for all values of 'R' .	Decreases momentarily then returns to normal.	Decreases and remains lower.	Increases and remains higher.

GUÍA DE ESTUDIO - JEFE DE MAQUINAS						
Q. Number	**Question**	**IMAGEN**	**A**	**B**	**C**	**D**
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT						
47	With one alternator on load, the main air start compressor starts up, overloading the alternator. What will happen initially?		The overload trip will operate and trip the alternator off the switchboard.	Non-essential circuits will be tripped off the switchboard.	The alternator low voltage trip will operate.	The generator overload trip will prevent the compressor from starting.
48	During parallel operation of two or more AC alternators, a failure of one of the prime-movers will not cause the associated alternator to be "motored" due to the action of...		the constant speed (isochronous) governor.	the automatic voltage regulator (AVR).	the reverse power protection relay.	the overcurrent protection relay.
49	What is the effect on an AC induction motor if it is loaded to 110% of rated capacity?		Draws higher than rated current, remains at near-normal speed.	Current does not increase but the motor slows down slightly.	Motor speed slows, overheats and damages the rotor windings.	Speeds up slightly to compensate for increased loading torque.
50	Of the following conditions, which is most likely to cause a "flame proof" designation to become invalid?		Operation of a motor without any time-delay fusing.	Frequent overloading of internal insulation.	Intermittent operation at high temperatures.	Severe corrosion or damage to the enclosure housing.
51	As a percentage of normal across-the-line starting current, a star-delta starter limits starting current for a 3 phase squirrel cage induction motor to a value of...		20% of across-the-line starting current.	50% of across-the-line starting current.	70% of across-the-line starting current.	33% of across-the-line starting current.

GUÍA DE ESTUDIO - JEFE DE MÁQUINAS	
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT	
ANSWERS	
1	C
2	B
3	B
4	B
5	B
6	A
7	C
8	D
9	B
10	C
11	D
12	A
13	B
14	B
15	C
16	B
17	A
18	B
19	A
20	B
21	D
22	C
23	B
24	D
25	B
26	B
27	B
28	A
29	D
30	D

GUÍA DE ESTUDIO - JEFE DE MÁQUINAS	
OPERATE ELECTRICAL AND ELECTRONIC EQUIPMENT	
ANSWERS	
31	B
32	A
33	B
34	C
35	A
36	A
37	B
38	C
39	D
40	D
41	B
42	D
43	B
44	C
45	D
46	C
47	B
48	C
49	A
50	D
51	D