Name …… ***Duration: 30 mins***

Exam

1- Multiple choice questionnaire (MCQ) (10 points)

Check the right answer

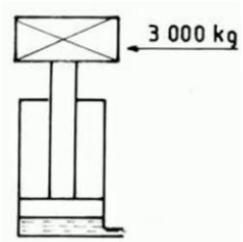
Exercise 1 :

A DC motor operates at constant flux. At nominal point: $\mathbf{T_{em}}$ **=40 Nm**: **U=240V: I=16A**. The armature has a resistance R (**R=0.70 Ω**). What must be the voltage $\mathbf{U_d}$ across the armature to obtain a starting torque of moment $\mathbf{T_{emd}}$**=80 Nm**?

	Ud=23.4V		Ud=21.4V	**x**	Ud=22.4V

Exercise 2:

On the rod of a cylinder is placed a mass of 3000kg, the cylinder bore of the cylinder is 80mm.



Calculate

1- The pressing force exerted on the oil?

	F=300N	**x**	F=30000N		F=3000N

2- The pressed surface?

x	S=50 cm^2		S=5 cm^2		S=0.5 cm^2

3- The pressure in bar?

	p=6bar		p=600bar	**x**	p=60bar

Exercise 3:

A permanent magnet stepper motor having the following features:

Stator: 8 phases; Rotor: 24 poles; Switching: Symmetrical; Angular pitch: 3°,75

1/ Calculate the number of steps per turn.

	$N_{p/tr}$=95	**x**	$N_{p/tr}$=96		$N_{p/tr}$=90

2/ Determine the type of switching.

x	K1=1		K1=3		K1=2

3°/ Determine the number of steps **Np** to be made for the rotor to rotate by 375°.

	Np=80		Np=60	**x**	Np=100

4/ Knowing that the motor takes 100 steps/s.

4-1 Determine the frequency **f** of the stepper motor control circuit clock signal.

	f=50 Hz	**x**	f=100 Hz		f=500 Hz

4-2 Calculate the time **t** in **(s)** set for the rotor to describe an angle of 3000°.

	t=10 s	**x**	t=8 s		t=9 s

4-3 Calculate the engine speed **n** in **rpm.**

x	n= 62,5		n= 64,5		n= 62

2- QUESTIONS (10 points)

Answer with true or false? and correct the errors?

1. The distributor is associated with an electric motor, the contactor is the pre-actuator associated with a pneumatic cylinder. (**false**)
   The contactor is associated with an electric motor, the distributor is the pre-actuator associated with a pneumatic cylinder.
2. Pre Actuators are elements that, in response to control signals, facilitate the distribution of power energy to the actuators. (**true**)
   ……..
3. The double rod cylinder has a rod passing through the entire body and a piston placed in the middle. (**true**)

   ……..
4. Variable reluctance stepper motor: This motor features teeth with identical pitch on both the stator and rotor; the rotor itself is not magnetized. (**false**)
   This motor has a toothing whose pitch is not the same for the stator and the rotor; the rotor is not magnetized.
5. A bistable dispenser if the return of the drawer to its initial position is ensured by a return spring. (**false**)
   A monostable dispenser if the return of the drawer to its initial position is ensured by a return spring.
6. An electromagnetic relay comprises a coil powered by the control circuit, and its mobile core induces the switching of contacts that can be positioned within a power circuit. Electromagnetic relays are typically employed for low-power applications. (**true**)
   ……
7. Single Acting Cylinder: the extension and retraction of the rod is carried out by the application of pressure. (**false**)

   Double acting cylinder: the extension and retraction of the rod is carried out by the application of pressure.
8. Supply voltage of an electromagnetic relay: It is an alternating voltage which excites the coil. (**false**)

   Supply voltage of an electromagnetic relay: It is a continuous voltage which excites the coil.
9. A stepper motor converts control pulses into a rotational movement of the rotor, typically characterized by **n** steps. (**true**)

……

10. The disconnector is a connecting device designed to isolate a circuit for performing maintenance or modification operations on the electrical circuits located upstream. (**false**)
    The disconnector is a connecting device designed to isolate a circuit for performing maintenance or modification operations on the electrical circuits located downstream