Total No. of Questions : 8]	SEAT No.:	

P2503 [Total No. of Pages: 3

[5253]-526

## T.E. (E & TC)

## MECHATRONICS

(2015 Pattern) (Semester - I)

*Time* : 2½ *Hours*]

[Max. Marks: 70

Instructions to the candidates:

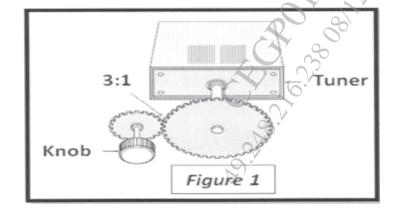
- 1) Answers any one Questions out of Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume Suitable data if necessary.
- Q1) a) A tachometer generator, used to measure the speed of rotation of IC engines, has an ideal rating of 6 V per 1000 rpm, a range of 0 4000 rpm & an accuracy of +/ 0.4% of full scale. If the output of the tachometer generator is 18 V, what is the ideal value of the speed? What are the minimum & maximum possible values of the speed?
  - b) Write short notes on :

[8]

- i) MEMS
- ii) Nano sensor
- c) Draw a diagram of gear pump. Explain its construction & working principle. [8]

OR

Q2) a) As shown in Figure 1, a radio tuner is connected to the tuning knob through a 3:1 gear mesh. If the knob is turned 70 degree, how many degrees does the tuner rotate?



	b)	Explain the working of gyroscope with a suitable sketch. [8]
	c)	Explain in details: [8]
		i) Relief valve
		ii) Centrifugal pump
Q3)	a)	Explain the following in details: [10]
		i) Air filter & water trap
		ii) Refrigerated dryer
	b)	Explain with a suitable sketch, how lubricator is used for lubrication.[4]
	c)	A pneumatic cylinder is required to move a 1000N load 150mm in 0.5s.
		What is the output power? [4]
		OR
Q4)	a)	Write short notes on the following: [10]
		i) Double acting cylinder
		ii) Air receiver
	b)	Compare hydraulic & pneumatic systems in mechatronics applications.
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	c)	Explain the working of diaphragm compressor. [4]
<b>Q</b> 5)	a)	What is relay? How is it useful in indirect switching of high voltage circuit? [8]
	b)	Explain power cables and signal cables. Where are they used in
	0)	Mechatronics automation systems? [8]
		OR OR
Q6)	a)	Explain the working of solenoid. [6]
	b)	Draw the symbol & explain the working of [10]
		i) 4/2 directional control valve (DCV)
		ii) 3/2 way spool valve.

- Q7) a) Discuss the necessity of autopilot system for boat. Explain its construction & working with a suitable sketch. [10]
  - b) Write a short note on CNC machine.

[6]

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- Q8) a) Develop an engine management system. Explain its construction, working & applications with a suitable sketch.[8]
  - b) Explain anti-lock braking system (ABS) technology. What are its major components? [8]

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