CLASS: BE   SEMESTER : VII/ADD
BRANCH: EEE   SESSION : MO/19

SUBJECT: EE8221 UTILISATION OF ELECTRICAL POWER

TIME: 3:00 HOURS   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

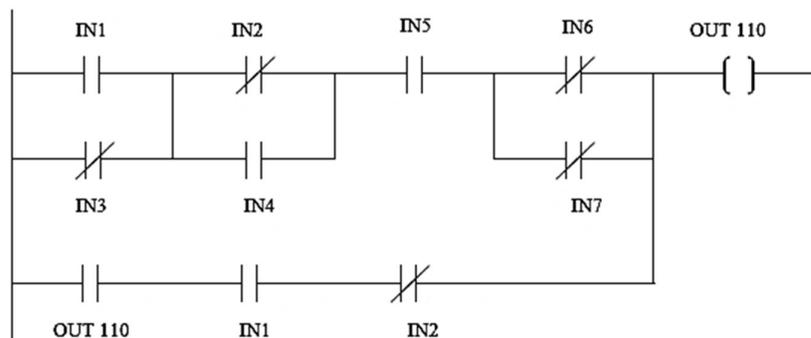|		
Q.1(a)	Explain how coefficient of adhesion depends on nature of motor speed - torque characteristic.	[2]
Q.1(b)	Explain the duty cycle of an electric train with the help of speed - time, torque - time and power - time diagrams.	[4]
Q.1(c)	Draw the trapezoidal speed - time curve for an electric train and using it find the specific energy consumption for an electric train. Consider braking operation also.	[6]
Q.2(a)	In 25 kV ac traction using semiconductor converter controlled dc motors why a converter with sequence control is employed.	[2]
Q.2(b)	Explain the operation of diesel engine driven three phase alternator supplying dc motors.	[4]
Q.2(c)	Explain the operation of PWM VSI squirrel cage induction motor drive which makes use of a synchronous link converter(SLC) for regenerative braking.	[6]
Q.3(a)	What are the requirements of a good heating material?	[2]
Q.3(b)	Explain butt welding and percussion welding.	[4]
Q.3(c)	Explain the operation of a core type induction furnace. Explain what is pinch effect.	[6]
Q.4(a)	Explain what is plane angle and solid angle.	[2]
Q.4(b)	What are polar curves. Derive the relation for MSCP.	[4]
Q.4(c)	Describe the construction and principle of operation and application of a fluorescent lamp.	[6]
Q.5(a)	Draw the timing diagram and schematic symbols for a delay on time delay relay. Explain	[2]
Q.5(b)	Explain the two handed operation with anti tie down and anti repeat of a machine. Draw its ladder diagram.	[4]
Q.5(c)	Explain the single cycle operation of a machine using a cam operated limit switch. Draw its ladder diagram.	[6]
Q.6(a)	Explain the difference between physical components and program components.	[2]
Q.6(b)	Write down the truth table for an R-S flip flop and draw its ladder diagram. Explain	[4]
Q.6(c)	Draw the AND OR lamp circuit. Draw its ladder diagram with the control transformer and fuse. Write down the mnemonic programming code for the ladder diagram shown in Figure 1.	[6]

FIG.1

Q.7(a)	Draw the detailed diagram of an electromagnetic type contactor and label the parts.	[2]
Q.7(b)	Explain the auxiliary contact interlocking method for control of an induction motor. Draw the control circuit.	[4]
Q.7(c)	Draw the power circuit and control circuit for a three phase induction motor fed from either of two supply sources. Explain.	[6]