

THIAGARAJAR POLYTECHNIC COLLEGE, SALEM

(Autonomous)

Reg. No.

April 2019 Examinations

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

Electrical Machines-II

Year/Sem: II / IV (EVEN-II)

Max. Marks : 75

Time : 3 hr.

PART-A**(5 x 2 = 10 Marks)****Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.****(ii) All questions carry equal marks.**

- 1 Write the formula for pitch factor and its value for a full pitched winding.
- 2 What is infinite busbar?
- 3 Define synchronous reactance.
- 4 If the starting current of a three phase induction motor without starter is 30 A, what is the value of starting current at i) DOL starter and ii) Star Delta starter.
- 5 Why Single phase induction motor is not self starting?
- 6 What is universal motor? State its any two applications.
- 7 What is the principle of BLDC motor?
- 8 What is pilot exciter?

PART-B**(5 x 3 = 15 Marks)****Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.****(ii) All questions carry equal marks.**

- 9 State the precautions for hydrogen cooling.
- 10 State the effects of armature reaction at i) UPF ii) zero power factor lagging and iii) zero power factor leading.
- 11 Draw the approximate equivalent circuit of three phase induction motor.
- 12 What is Cogging? How it is prevented?
- 13 Compare 3 phase synchronous motor and 3 phase induction motor on any three aspects.
- 14 Draw the 'V' curve and inverted 'V' curve of synchronous motor.
- 15 What is Synchro? Name any two types of it.
- 16 What is linear induction motor? Where it is used?

PART-C**(5 x 10 = 50 Marks)****Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.****(ii) All divisions carry equal marks.**

- 17 A Explain the constructional details of salient pole rotor and cylindrical type rotor with neat sketches. 10
(OR)
B The stator of a 3 phase, 20 pole alternator has 120 slots and 4 conductors per slot are accommodated in two layers. If the speed of the alternator is 300 rpm, Calculate the emf induced per phase. Assume flux per pole is 55 mWb and coil span is 150° electrical. 10
- 18 A Explain the synchronous impedance method of finding the voltage regulation of alternator. 10
(OR)
B Explain the synchroscope method of synchronizing three phase alternators. 10
- 19 A Explain any two rotor side speed control methods adopted to 3 phase slip ring induction motor. 10
(OR)
B Explain the construction and working of double cage induction motor. 10
- 20 A Explain the construction and working of shaded pole motor. 10
(OR)
B Explain the phenomenon of hunting and its prevention in synchronous motor. 10
- 21 A Explain the construction and working of AC servo motor. 10
(OR)
B Explain the construction and working of variable reluctance stepper motor. 10

PART-A**(5 x 2 = 10 Marks)****Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.****(ii) All questions carry equal marks.**

- 1 Define Accuracy of a measuring instrument.
- 2 What is a meggar?
- 3 List the errors in single phase Energy Meter.
- 4 List the features of a Net meter.
- 5 Name the bridge used for measuring unknown capacitance.
- 6 List the types of supports used in an instrument.
- 7 What is a synchroscope?
- 8 What is an instrument transformer?

PART-B**(5 x 3 = 15 Marks)****Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.****(ii) All questions carry equal marks.**

- 9 List the applications of measurement systems.
- 10 What are shunts? Give their requirements.
- 11 Draw the circuit for measuring of reactive power in a three phase balanced load.
- 12 List the parameters measured by a digital trivector meter.
- 13 What is the use of Time base Generator in a CRO?
- 14 What is instrument efficiency?
- 15 What is creep error and how is it adjusted?
- 16 What do you mean by burden in Current Transformers?

PART-C**(5 x 10 = 50 Marks)****Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.****(ii) All divisions carry equal marks.**

- 17 A Explain in detail the functions of the three operating forces used in an instrument. 10
(OR)
B What is the use of controlling force in an instrument and explain the methods of producing it and compare them. 10
- 18 A With a neat sketch explain the construction and operation of attraction type moving Iron Instrument and give its torque equation. 10
(OR)
(B) With neat sketch explain the construction and operation of Permanent Magnet Moving Coil Instrument and give its torque equation. 10
- 19 A Explain the construction and working principle of dynamometer type wattmeter. 10
(OR)
B Draw the construction and explain the working principles of single phase energy meter. 10
- 20 A Draw the construction and explain the working principle of single phase power factor meter. 10
(OR)
B Draw the block diagram and features of
(i) Static TOD Meter 5
ii) Automatic Power Factor Controller 5
- (21) A Draw the circuit and explain how an unknown Capacitance and unknown Inductance are measured using AC Bridges. 10
(OR)
B Draw the block diagram and explain the working of Cathode Ray Oscilloscope. 10

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DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

Transducers and Signal Conditioners

Year/Sem: II / IV (EVEN-II)

Max. Marks : 75

Time : 3 hr.

PART-A**(5 x 2 = 10 Marks)****Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.****(ii) All questions carry equal marks.**

- 1 Define Passive transducer. Give one example.
- 2 What do you meant by load cell?
- 3 Mention any two applications of Capacitive transducer.
- 4 State the basic principle of thermocouple.
- 5 Define an OP-AMP. State its applications.
- 6 What is meant by ADC and DAC?
- 7 State the advantage of Active Filter.
- 8 What is a tachogenerator? and mention the types.

PART-B**(5 x 3 = 15 Marks)****Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.****(ii) All questions carry equal marks.**

- 9 Mention and define any three basic requirements of transducers.
- 10 Differentiate between Primary and Secondary Transducer.
- 11 State the basic principle of Inductive transducers.
- 12 Write a note on piezoelectric transducer.
- 13 Mention the principle of working of solar cell.
- 14 Draw the pin diagram and list the ideal characteristics of OP-AMP.
- 15 Write note on HPF.
- 16 How the OP – AMP is used as Zero crossing Detector?

PART-C**(5 x 10 = 50 Marks)****Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.****(ii) All divisions carry equal marks.**

- 17 A Explain the operation of Bourdon tubes and Bellows for pressure measurement with relevant sketches. 10
(OR)
- B Discuss about the working of thermistor and its types. Also list the advantages, disadvantages and applications. 10
- 18 A Explain the construction, working and applications of Strain gauge with relevant sketches. 10
(OR)
- B Explain the construction and working of Inductive Proximity Sensor. 10
- 19 A With a neat sketch explain the working of Hall effect transducer. 10
(OR)
- B With a neat sketch explain the construction and working of Geiger Muller tube to measure the radiation. 10
- 20 A Explain how an OP-AMP can be used as an integrator. 10
(OR)
- B Explain with a neat block diagram, the AC and DC signal conditioning system. 10
- 21 A With a neat circuit, explain the operation of positive clipper and negative clipper circuit using OP-AMP. 10
(OR)
- B Explain the operation of successive approximation ADC with necessary diagram. 10

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DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

DIGITAL ELECTRONICS

Year/Sem: II / IV (EVEN-II)

Max. Marks : 75

Time : 3 hr.

PART-A**(5 x 2 = 10 Marks)**

**Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.
(ii) All questions carry equal marks.**

- 1 State De-Morgan's theorem.
- 2 Define tristate logic.
- 3 Find 1's and 2's complement of 10101 binary number.
- 4 What is parity bit?
- 5 Define flip-flop.
- 6 Differentiate Synchronous and Asynchronous counter.
- 7 What is volatile memory?
- 8 Name the flags used in microprocessor 8085.

PART-B**(5 x 3 = 15 Marks)**

**Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.
(ii) All questions carry equal marks.**

- 9 Draw the symbol and truth table of EX-NOR gate.
- 10 Realize AND, OR gates using NAND gate.
- 11 Briefly explain parity generator with logic diagram.
- 12 Draw the logic circuit for Mod 7 counter.
- 13 Draw the logic diagram and truth table of JKFF.
- 14 Differentiate static memory and dynamic memory.
- 15 Explain interrupt signals used in 8085.
- 16 Name the general purpose registers used in 8085 microprocessor.

PART-C**(5 x 10 = 50 Marks)**

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question.

(ii) All divisions carry equal marks.

- 17 A Draw and explain the realization of AND, OR and NOT gates using 1. NAND Gate 10
2. NOR Gate only.
- (OR)**
- B Simplify the following function using K map $F = \Sigma (0, 2, 4, 6, 8, 10, 12, 14)$. 10
- 18 A i) Explain the operation of Half subtractor. 5
ii) Explain 3 to 8 decoder. 5
- (OR)**
- B i) Draw the circuit diagram for 4 bit BCD adder. 5
ii) Explain the working operation of multiplexer with logic diagram. 5
- 19 A Explain 4 bit binary ripple up counter with diagram and wave forms. 10
- (OR)**
- B i) Draw the logic diagram of T FF and explain its operation. 5
ii) Explain PIPO shift register. 5
- 20 A Explain ROM organizations with neat diagram. 10
- (OR)**
- B Explain the read/write operation of static RAM. 10
- 21 A Explain the architecture of 8085 with neat diagram. 10
- (OR)**
- B Draw and explain the timing diagram of MOV r1, r2 instruction. 10
