

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MSc DEGREE EXAMINATION MAY 2019
(Second Semester)**

Branch - APPLIED ELECTRONICS

PROGRAMMABLE LOGIC CONTROLLER

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks!)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 x 1 = 10)

- 1 PLC is an acronym of _____ Logic Controller.
 (i) Programmable (ii) Peripheral
 (iii) Periodic (iv) Pneumatic
- 2 Which one of the following is an input device?
 (i) Motor (ii) Light *
 (iii) Valve (iv) Sensor
- 3 Ladder Logic Programming consists primarily of _____.
 (i) Virtual relay contacts and coils
 (ii) Logic gate symbols with connecting lines
 (iii) Function blocks with connecting lines
 (iv) Text-based code
- 4 An OR function implemented in ladder logic uses
 (i) Normally-closed contacts in series
 (ii) Normally-open contacts in series
 (iii) A single normally-closed contact
 (iv) the entire program takes to execute
- 5 In a PLC, the scan time refers to the amount of time in which _____.
 (i) the technician enters the program
 (ii) timers and counters are indexed
 (iii) one "rung" of ladder logic takes to complete
 (iv) the entire program takes to execute
- 6 In PLC programming, a retentive function is one that
 (i) Defaults to the "on" state (ii) Comes last in the program
 (iii) Defaults to the "off" state (iv) Is not reset after a power cycle
- 7 _____ is a repetition of some element of a program that is repeated as long as some condition prevails.
 (i) Loop (ii) if-else
 (iii) Pseudo code (iv) Sequence
- 8 The term _____ is used for a timing check that is carried out by the PLC.
 (i) Counter (ii) Watchdog
 (iii) Relay (iv) All the above
- 9 SCADA is _____.
 (i) System (ii) Process
 (iii) Software (iv) Direct Control
- 10 The term SCADA, this stands for _____.
 (i) Supervisory control and data acquisition system
 (ii) Supervisory control and data access system
 (iii) Supervisory control and data ascending system
 (iv) **Supervisory control and data acquisition system**

SECTION - B (35 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

- 11 a Draw the block diagram of PLC and explain briefly.
OR
b Write a note on input and output devices.
- 12 a Design a ladder diagram to generate square wave.
OR
b Explain the working of battery backed relay.
- 13 a Give a short note on 'ON' and 'OFF' time delay.
OR
b Discuss the operation of pulse on timer.
- 14 a How we can develop the program for designing systems? Explain.
OR
b Write a short note on fault finding with an example.
- 15 a Explain the function of hardware and software in SCADA systems.
OR
b Describe the function of RTU.

SECTION - C (30 Marks)

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

- 16 Draw and explain the basic architecture of PLC.
- 17 Write the Ladder program for the following logic function
(i) AND (ii) NAND (iii) NOT.
- 18 Explain in detail about Retentive on delay timer (RTO) with timing diagram.
- 19 Give a detailed account on valve sequencing and conveyor belt control process.
- 20 List out and briefly explain the fundamental units of SCADA.

Z-Z-Z

END