KUMARAGURU college of technology
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Register Number:……..….

M.E DEGREE EXAMINATIONS: JAN 2015

(Regulation 2014)

First Semester

POWER ELECTRONICS AND DRIVES

P14PETE01: Industrial Control Electronics

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In a circuit breaker, arc is initiated by the process of, [K_1]

   a) Thermal emission b) Field emission

   c) Ionizing the oil d) Either (a) or (b)

2. Advantages of PLCs over Electromechanical relays [K_2]
   A. PLCs are more reliable and faster in operation
   B. They require high electrical power
   C. They are compact and can be expanded easily

   a) A&B are TRUE and C is FALSE b) A&C are TRUE and B is FALSE

   c) All are TRUE except A&C d) All are TRUE except A

3. The schematic arrangement of an on-line UPS as follows,(i) Power main (ii) Inverter (iii) Battery (iv) Transfer switch. [K_2]

   a) i-ii-iii-iv b) i-iii-ii-iv

   c) ii-i-iv-iii d) iv-iii-ii-i

4. Match the appropriate item from the RHS with those on the LHS. [K_2]

(A) Transducer	(P)Max well
(B) Op-Amp	(Q) Poynting's vector
(C) Displacement current	(R) Comparator
(D) Power flow	(S) Signal conversion
	(T) Gauss's law

   a) A-S,B-R,C-P,D-T b) A-T,B-S,C-P,D-Q

   c) A-S,B-R,C-P,D-Q d) A-T,B-S,C-P,D-R

5. In a typical NC system the motion and machining instructions and the related numerical data, together called as [K_2]

   a) Part program b) Syntax information

c) Segment length d) Coolant flow

6. Match the appropriate item from the RHS with those on the LHS. [K_2]

(A) Trolley	(P) Material storage
(B) Tractor	(Q) Easy Process
(C) Automation	(R) Material handling/moving
(D) yard	(S) Carry Small components

a) A-S,B-R,C-P,D-Q b) A-P,B-S,C-R,D-Q

c) A-S,B-R,C-Q,D-P d) A-Q,B-S,C-P,D-R

7. One of the following equipment is an example of opto electronic device [K_1]

a) Cranes b) SCR

c) Photo transistor d) Megger

8. The application of Fibre optic communication is [K_2]

a) Slow in process b) Applicable in vibrated places

c) Fast data Transfer d) Less power losses

9. (i)The main drawback of a digital factory, process monitoring is difficult. [K_2]
(ii) Increased Production in automated Industry .the above two statements are

a) Both are relevant and true b) Both are relevant (i) true and (ii) false

c) Both are relevant (i) false and (ii) true d) Both are irrelevant and false

10. A typical steel industry product life cycle as follows,(i) Raw material Collection (ii) Molding [K_3]
(iii) Melding the raw materials (iv) Quality checking.

a) i-ii-iii-iv b) i-iii-ii-iv

c) ii-i-iv-iii d) iv-iii-ii-i

PART B (10 x 2 = 20 Marks)

11. List the objectives of Industrial instrumentation. [K_1]
12. State the merits of tap changing transformer. [K_2]
13. Distinguish between Logic Control and Analog Control. [K_3]
14. Identify the major functions performed by a PLC. [K_2]
15. List the major types of CNC machines. [K_1]
16. Define numeric control system. [K_1]
17. State the principle of photo diode. [K_2]
18. List the main advantages of opto devices. [K_2]
19. List the major roles of process monitoring system. [K_1]
20. How is the process of automation involved in a Thermal plant. [K_2]

PART C (6 x 5 = 30 Marks)

21.	Describe the working of SMPS in industrial instrumentation.	[K_2]
22.	Compare the solid- state circuit breaker with ordinary circuit breaker.	[K_3]
23.	Explain the intelligent system monitoring and supervision control.	[K_2]
24.	Explain the difference between cranes and hoists.	[K_2]
25.	Explain how are the opto electronic devices working.	[K_2]
26.	Develop the automation system for a water treatment plant.	[K_3]

PART D (4 x 10 = 40 Marks)

27.	Design and develop the on-line and off-line UPS topologies.	[K_3]
28.	Describe the open loop and closed loop CNC system.	[K_2]
29.	Explain the ladder logic and I/O processing of PLC system.	[K_2]
30.	Explain the industrial control electronics applicable in a cement plant.	[K_2]

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