Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

RA3CO09 Industrial Electronics

Programme: B.Tech. Branch/Specialisation: RA

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The effect of cascading several amplifiers is to- **1**
(a) Reduce the overall gain
(b) Reduce the overall frequency response
(c) Increase the overall gain and reduce the frequency response
(d) Decrease the overall gain and increase the frequency response

ii. What is the disadvantage of a class B push-pull amplifier? **1**
(a) The efficiency reduces
(b) The figure of merit increases
(c) The Q-power dissipation is very large
(d) The cross-over distortion occurs

iii. The flip flops are categorized into ____ types. **1**
(a) One (b) Two (c) Three (d) Four

iv. How many possible conversions are there to convert SR flip flop to other flip flops? **1**
(a) One (b) Two (c) Three (d) Four

v. The turn off time is longer than turn on time because- **1**
(a) The anode and cathode junctions get reverse biased while gate junction is still forward biased
(b) There is flow of reverse current
(c) The gate pulse has applied
(d) The forward break over voltage is high

vi. A Diac is a semi-conductor device which acts as a- **1**
(a) 2 terminal unidirectional switch
(b) 2 terminal bidirectional switch
(c) 3 terminal bidirectional switches
(d) 4 terminal multi-directional switches

vii. A rectifier can be called as- **1**
(a) Amplitude detector (b) Signal detector
(c) Current controlled device (d) Voltage controlled device

viii If the firing angle becomes negative, then the rectifier begins to work as- **1**
(a) A rectifier (b) An inverter
(c) A chopper (d) A regulator

ix. A power supply which has voltage regulation of ____ is unregulated power supply. **1**
(a) 0 % (b) 5 % (c) 10 % (d) 8%

x. Which one is a type of linear voltage regulator? **1**
(a) Series (b) Parallel (c) Step-up (d) Step-down

Q.2 i. Compare class A and class B amplifier. (Any six) **3**
ii. Define and explain transformer coupled and push-pull amplifier with diagram. **7**
OR iii. Explain OP-AMP as a pulse generator with diagram. **7**

Q.3 i. What is edge triggering? **3**
ii. Explain Flip-flops – SR & JK with diagram, Truth table in detail. **7**
OR iii. Explain various digital logic gates with truth table in details. **7**

Q.4 i. Explain the operation of SCR using two transistor analysis? **3**
ii. What are the various triggering methods of thyristors? Explain them in detail. **7**
OR iii. Explain the basic working principle of IGBT in details. **7**

Q.5 i. Explain series and parallel inverters. **3**
ii. Explain various control strategies used for controlling of chopper circuits. **7**
OR iii. What is a switch mode converter? What is flyback converter explain in detail? **7**

Q.6 i. Compare linear and switched power supply. (Any six) **3**
ii. Explain different performance parameters of power supplies. **7**
OR iii. Explain in detail SMPS with diagram. **7**

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Marking Scheme

RA3CO09 Industrial Electronics

Q.1 i. The effect of cascading several amplifiers is to- **1**
(c) Increase the overall gain and reduce the frequency response

ii. What is the disadvantage of a class B push-pull amplifier? **1**
(d) The cross-over distortion occurs

iii. The flip flops are categorized into ____ types. **1**
(d) Four

iv. How many possible conversions are there to convert SR flip flop to other flip flops? **1**
(c) Three

v. The turn off time is longer than turn on time because- **1**
(a) The anode and cathode junctions get reverse biased while gate junction is still forward biased

vi. A Diac is a semi-conductor device which acts as a- **1**
(b) 2 terminal bidirectional switch

vii. A rectifier can be called as- **1**
(a) Amplitude detector

viii. If the firing angle becomes negative, then the rectifier begins to work as- **1**
(a) A rectifier

ix. A power supply which has voltage regulation of ____ is unregulated power supply. **1**
(c) 10 %

x. Which one is a type of linear voltage regulator? **1**
(a) Series

Q.2	i.	Compare class A and class B amplifier. (Any six)		**3**
		0.5 mark for each	(0.5 mark * 6)	
	ii.	Transformer coupled and push-pull amplifier		**7**
		Definition 1 mark for each (1 mark * 2)	2 marks	
		Explanation	3.5 marks	
		Diagram	1.5 marks	
OR	iii.	OP-AMP as a pulse generator	5 marks	**7**
		Diagram	2 marks	

Q.3	i.	Edge triggering		**3**
	ii.	Flip-flops – SR & JK with diagram, Truth table		**7**
		3.5 marks for each	(3.5 marks *2)	
OR	iii.	Digital logic gates with truth table		**7**
		As per the explanation		

Q.4	i.	Operation of SCR using two transistor analysis	2 marks	**3**
		Diagram	1 mark	
	ii.	Triggering methods of thyristors	2 marks	**7**
		Explanation of them	5 marks	
OR	iii.	Working principle of IGBT	5 marks	**7**
		Diagram and symbol	2 marks	

Q.5	i.	Series inverters	1.5 marks	**3**
		Parallel inverters	1.5 marks	
	ii.	Two control strategies with name	2 marks	**7**
		Explanation 2.5 mark for each (2.5 marks * 2)	5 marks	
OR	iii.	Switch mode converter	2 marks	**7**
		Flyback converter	2 marks	
		Explanation with diagram	3 marks	

Q.6	i.	Compare linear and switched power supply. (Any six)		**3**
		0.5 mark for each	(0.5 mark * 6)	
	ii.	Different performance parameters of power supplies		**7**
		As per the explanation		
OR	iii.	SMPS	4 marks	**7**
		Diagram	3 marks	

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