

**UNIVERSITY OF PUNE**  
**[4361]-12**  
**F. E.(Common)Examination - 2013**  
**BASIC ELECTRONICS ENGINEERING**  
**(2008 Pattern)**

[Total No. of Questions: 6]  
[Time : 2 Hours]

[Total No. of Printed Pages :3]  
[Max. Marks : 50]

- (1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 .
- (2) Answers all questions in *same answer-book*.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of electronics pocket calculator is allowed.
- (6) Assume suitable data, if necessary.

- Q1 a) A bridge rectifier is applied with input from a step down transformer [8]  
having turns ratio 8:1 and input 230V, 50Hz. If  $R_f = 1\Omega$ ,  $R_s = 10\Omega$  and  
 $R_L = 2\text{ K}\Omega$ . Find: I. DC power output II. PIV across each diode  
III. Percentage efficiency IV. Percentage regulation at full load.
- b) Explain how transistor can be used as an amplifier with the help of [6]  
load line approach.
- c) State the various methods of turning on SCR. [4]

**OR**

- Q2 a) With the help of neat circuit diagram, explain how will you use the [8]  
Zener diode as a voltage regulator. What is maximum and minimum limit  
for the load current?

b) Sketch JFET drain and transfer characteristics and indicate following [6]  
parameters: I. Pinch off voltage      II. Drain self saturating current

III.  $V_{GS(OFF)}$       IV. Region of operation

c) Draw and explain V-I characteristics of Triac. [4]

Q3 a) Draw a neat diagram of three-input inverting summing amplifier using [8]  
op-amp and obtain the expression of its output voltage.

b) Realize three-input gate using two-input gates for the following gate: [8]

I. AND      II. OR      III. NAND      IV. NOR

**OR**

Q4 a) A sinusoidal signal with peak value 6mV with 2kHz frequency is [8]  
applied to the input of ideal op-amp integrator with  $R_1 = 100 \text{ k}\Omega$  and  
 $C_f = 1 \mu \text{ F}$ .

Find the output voltage.

b) Prove the following using DeMorgan's theorem. [8]

1)  $AB+CD = \overline{(\overline{A}\overline{B})} \cdot \overline{(\overline{C}\overline{D})}$

2)  $(A+B)(C+D) = \overline{(\overline{A}\overline{B}) + (\overline{C}\overline{D})}$

Q5 a) Explain the following characteristics of transducer: [4]

I. Accuracy      II. Ruggedness      III. Linearity      IV. Repeatability

b) Explain the principal of operation of Strain Gauge. [4]

c) Explain Super-heterodyne receiver with the help of block diagram. [8]

**OR**

- Q6 a) What is RTD? Draw its constructional diagram and explain its operation. [8]
- b) Explain wired communication and wireless communication. [4]
- c) Explain problem with pair cables. State different types of twisted pair cable. [4]