QP Code : 5743

(3 Hours) [Total Marks : 80

N.B: (1) Question No. 1 is **compulsory**
(2) Solve any **3** from remaining **5** questions.
(3) **Figures** to the **right** indicate **full marks.**
(4) Assume suitable **data if necessary** and mention the same in the answer sheet.

1. Solve any five : 20
   (i) Differentiate between synchronous counters and ripple counters.
   (ii) Differentiate between inverting and non-inverting amplifier.
   (iii) Design first order non-inverting low pass filter to provide cutoff frequency of 10KHz.
   (iv) Explain 7490 decade counter.
   (v) Design voltage regulator to provide output voltage equal to 5V and load current 1 Amp using IC 7805.
   (vi) With the help of neat circuit diagram explain any one application of PLL565.

2. (a) What is a precision rectifier ? Draw the diagram for a full wave precision rectifier. With the help of waveforms at different points in the circuit explain its working. 10

   (b) With the help of a neat circuit diagram explain working of RC phase shift Oscillator. 10

3. (a) Draw functional block diagram of IC723 and explain its working as low voltage regulator and high voltage regulator. 10

   (b) With the help of neat circuit diagrams explain how analog multiplier AD 534 can be utilised for : 10
      (i) analog division and
      (ii) Square root extraction.

4. (a) Draw and explain the functional diagram of IC555 and explain its operation in astable mode. 10

   (b) Explain working of : 10
      (i) logarithmic amplifier and
      (ii) Anti logarithmic amplifier with the help of circuit diagram.

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5. (a) With the help of a neat circuit diagram explain the working of Universal shift   10
register IC74194 as a 4bit, 4-state Ring counter with a single circulating 'I' .

(b) With the help of a neat circuit diagram explain the working of 74163   10
synchronous 4 bit binary coutner. Also illustrate the cascading connections for
74163 based coutners.

6. Write short notes on any **four** :   20
     (i)   74181 Arithmetic Logic Unit
     (ii)   Instrumentation Amplifier
     (iii)   Switching Regulator
     (iv)   Voltage to frequency converter
     (v)   Triangular wave generator.