**B. Tech. Sem –III (Electrical Engg.) 2014 COURSE) (CBCS) :**
**WINTER - 2018**

**SUBJECT : LINEAR AND DIGITAL INTEGRATED CIRCUTS**

Day: Wednesday
Date: 28/11/2018

**W-2018-2298**

Time: 10.00 AM TO 01.00 PM
Max. Marks:60

---

**N.B.**

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Draw neat diagrams **WHEREVER** necessary.

---

**Q.1** **a)** Draw open loop and closed loop frequency response of operational amplifier and explain. State typical values of gain and bandwidth for an op amp 741. **(04)**

**b)** Define : **(06)**
**i)** Input offset voltage **ii)** Bias current **iii)** CMRR

**OR**

**Q.1** **a)** Draw circuit diagram of noninverting ac amplifier with a gain of 101, with Rf & Ri values. If $v_{in} = 0.02\sin\omega t$, what is the output voltage? **(04)**

**b)** Draw circuit diagram of V to I converter and describe its operation. **(06)**

**Q.2** **a)** Draw circuit diagram of op.amp as integrator and write mathematical equation. Draw input and output waveforms when square wave of 2V 1kHz is applied at input. **(05)**

**b)** Describe the operation of zero crossing detector with circuit diagram and input, output waveforms. **(05)**

**OR**

**Q.2** **a)** Draw circuit diagram of precision full wave rectifier and describe its operation with input, output waveforms. **(05)**

**b)** Draw circuit diagram and explain sample and hold circuit. **(05)**

**Q.3** **a)** What is the difference between passive filter and active filter? Draw circuit diagram and frequency response of first order low pass and high pass filter. **(06)**

**b)** State specifications of IC 723 and draw its pin diagram. **(04)**

**OR**

**Q.3** **a)** Draw IC555 block diagram and describe its operation as astable multivibrator. Show output waveform and state frequency of operation. **(06)**

**b)** Draw three pin regulator diagram and state its specifications. **(04)**

**Q.4** **a)** Convert the following: **(04)**

*i)* $(1E.53)_{16} = (\_\_)_8$

*ii)* $(170)_{10} = (\_\_)_{16}$

*iii)* $(0.345)_{10} = (\_\_)_8$

*iv)* $(24)_8 = (\_\_)_2$

**b)** Explain 1 bit comparator with neat block diagram & truth table. **(06)**

**P.T.O.**

**OR**

**Q.4** State and prove the two D'Morgan's theorem with neat truth table. **(10)**

**Q.5 a)** Draw a neat labeled diagram of full adder using gates & explain the working using truth table. **(06)**

**b)** Why is NAND & NOR gate called as universal gate? Explain giving two examples each. **(04)**

**OR**

**Q.5 a)** Design BCD to 7 segment decoder with the help of truth table. Draw its logic diagram. **(07)**

**b)** Compare static RAM & Dynamic RAM. **(03)**

**Q.6 a)** Compare Asynchronous & synchronous counter. **(04)**

**b)** List various types of shift registers & explain each with the help of logic diagram. **(06)**

**OR**

**Q.6 a)** Draw the symbol & write the truth table of following : **(08)**
**i)** SR **ii)** JK **iii)** T **iv)** D

**b)** Explain D latch with the help of logic symbol & truth table. **(02)**

* * * * *