

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-IV Remedial Examination Nov/ Dec. 2010****Subject code: 141101****Subject Name: Advance Electronics****Date: 03 / 12 / 2010****Time: 03.00 pm – 05.30 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain briefly the following terms: **07**
 (1) Common mode rejection ratio (2) “Barkhausen criteria” for oscillator circuit.
- (b) With neat circuit explain the two inputs TTL NAND gate using TOTAM POLE output **07**
 also mention the advantages and disadvantages of TOTAM POLE output.
- Q.2** (a) Define the following terms: : **07**
 (1) Input bias current (2) Input offset voltage (3) PSRR (4) Noise margin
 (5) fan-in (6) Propagation delay (7) Figure of merit for logic families
- (b) Design the following circuits : **07**
 (1) Design R-C Phase shift oscillator to produce sinusoidal output of 1Khz.
 (2) Design colpitt’s oscillator to get frequency of 100Khz with an active device BJT having $h_{fe}=45$ and assume $\beta=50$ and $V_{cc}=10\text{volt}$.
- OR**
- (b) Define slew rate and describe the technique to measure slew rate. **07**
- Q.3** (a) Describe the operation of Emitter coupled differential amplifier. **07**
 (b) Describe the principle of crystal oscillator along with AC equivalent circuit and get the diagram of variation in x_j with ω . **07**
- OR**
- Q.3** (a) Describe the comparison of IC logic families. **07**
 (b) Derive the equation to get frequency of Wien bridge oscillator. **07**
- Q.4** (a) Solve the examples : **07**
 (1) Calculate the analog output of the 4-bit DAC if digital output is 1011 assume $V_{fs}=5\text{volt}$
 (2) 5-bit R-2R ladder network with $0=0\text{volt}$ and $1=10\text{V}$ Find (1) Analog output due to LSB change (2) Full scale output voltage
- (b) Obtain the expressions : **07**
 (1) Obtain the expression for transfer gain for negative feedback.
 (2) Obtain the expression of input resistance and output resistance of an amplifier for voltage shunt feedback.
- OR**
- Q.4** (a) Mention the types of ADC and describe successive approximation type of ADC. **07**
 (b) Draw the equivalent circuit : **07**
 (1) Hybrid Π common emitter model (2) Equivalent circuit of Ideal Op-amp
- Q.5** (a) Classify the amplifiers types based on position of operating point and also explain the distortion in amplifiers **07**
 (b) Explain with neat circuit diagram Tristate TTL devices. **07**
- OR**
- Q.5** (a) Describe the effect of bypass capacitor and coupling capacitor in multi stage common emitter amplifier. **07**
 (b) Describe the effect of negative feedback on amplifier bandwidth. **07**
