

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV(NEW) EXAMINATION – WINTER 2022****Subject Code:3141002****Date:13-12-2022****Subject Name:Analog Circuit Design****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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| Q.1 | (a) Define following terms.
CMRR, PSRR, Slew Rate. | 03 |
| | (b) Explain Voltage Transfer Curve of OP-AMP. | 04 |
| | (c) Write and explain differential amplifier using two OP-AMP. | 07 |
| Q.2 | (a) List OP-AMP's ideal characteristics. | 03 |
| | (b) Derive gain expression for voltage series F/B amplifier using OP-AMP. | 04 |
| | (c) Explain inverting differentiator circuit using OP-AMP. | 07 |
| | OR | |
| | (c) Explain instrumentation amplifier circuit operation using OP-AMP. | 07 |
| Q.3 | (a) Explain circuit made up of OP-AMP that does average of inputs. | 03 |
| | (b) Explain Schmitt trigger circuit using OP-AMP. | 04 |
| | (c) Explain 2 nd order low pass filter using OP-AMP with derivations. | 07 |
| | OR | |
| Q.3 | (a) Define following terms.
Lock Range for PLL, Capture Range for PLL, Frequency Stability for Oscillators. | 03 |
| | (b) Explain class B power amplifier. | 04 |
| | (c) Draw and explain triangular wave generator using OP-AMP. | 07 |
| Q.4 | (a) Explain floating load V to I converter using OP-AMP. | 03 |
| | (b) Explain phase shift oscillator using OP-AMP in detail. | 04 |
| | (c) Explain CE short-circuit current gain with resistive load R_L . | 07 |
| | OR | |
| Q.4 | (a) Explain sample hold circuit using OP-AMP. | 03 |
| | (b) Draw and explain class AB power amplifier. | 04 |
| | (c) Derive expression for trans-conductance g_m in Hybrid – Π model. | 07 |
| Q.5 | (a) Design Monostable multivibrator using timer IC for $T_P = 11$ millisecond, take $C = 0.1$ microfarad. | 03 |
| | (b) Write short note on voltage regulator. | 04 |
| | (c) Explain A-stable multivibrator using timer IC. | 07 |
| | OR | |
| Q.5 | (a) Explain half wave rectifier circuit using OP-AMP. | 03 |
| | (b) Design A-stable multivibrator using IC 555 for $T_{on} = 75\%$ of T , take $F = 1$ KHz, $C = 0.1$ microfarad. | 04 |
| | (c) Explain monostable multivibrator using IC 555. | 07 |
