Code No: RT31026 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November -2018

LINEAR & DIGITAL IC APPLICATIONS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) Explain the significance of level translator [3M]

b) Define CMRR and PSRR**.** [3M]

c) What is an instrumentation amplifier? [4M]

d) Draw the block diagram of a PLL? [4M]

e) What are the advantages of active filters over passive filters? [4M]

f) Define the terms Conversion time, Percentage resolution related to ADC. [4M]

PART -B

2 a) Draw the circuit diagram of a basic differential amplifier and explain its transfer characteristics. [8M]

b) Draw the circuit diagram of dual input unbalanced output differential amplifier and derive the expression for dc analysis. [8M]

3 a) Discuss briefly about the DC characteristics of an operational amplifier? [8M]

b) Define the terms: SVRR, Input bias current, Input offset voltage, Gain bandwidth product. [8M]

4 a) With a neat sketch explain the principle of operation of Antilog amplifier. [8M]

b) Design a differentiator to differentiate an input signal that varies in frequency from 100Hz to 10 KHz. If a sine wave of 1.2V Peak at 10 KHz is applied to the differentiator of part, draw its output wave form. [8M]

5 a) Why the name was given to 555 Timer. Draw monostable multivibrator using 555 Timer and explain the operation. [8M]

b) Design an Astable multivibrator having an output frequency 15 KHz with duty cycle of 40%. [8M]

6 a) With neat circuit diagram explain the operation of 2^{nd} order butter worth HPF and derive an expression for voltage gain. [8M]

b) Design a Band Pass filter with fc = 1 KHz, Q = 3 and A_f = 10. Draw the circuit with all the components. [8M]

7 a) Draw the schematic circuit diagram of dual-slope A/D converter and explain its operation. Derive expression for output voltage. [8M]

b) Define important performance specifications of Digital to Analog converters and list their typical values. [8M]

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Code No: RT31036 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2018

METROLOGY

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) State the condition when the shaft based system is used for limits and fits. [3M]
b) Write short notes on 'Standards'. [4M]
c) What are the applications of tool makers microscope? [4M]
d) List the advantages of electronic comparators. [3M]
e) What are the applications of flange micro meter? [4M]
f) Name the various instruments required for performing the alignment tests on machine tool. [4M]

PART –B

2 a) Define fit and describe various types of fits in brief? [8M]
b) Determine and sketch the limits of tolerance and allowance for a 42 mm shaft and hole pair designated as H 8 - g10. The basic size lies in the range of 30 – 50 mm. The multipliers for grades 8 and 10 are 25 and 64 respectively. The fundamental deviation for g shaft is (- 2.5 $D^{0.34}$) microns. The standard tolerance unit is i = 0.45 $(D)^{1/3}$+ 0.001D in microns. [8M]

3 a) Explain the construction and working of a Vernier Caliper. [8M]
b) State and explain the Taylor's principle of gauge design with neat sketch of Plug gauge and Snap gauges. [8M]

4 a) With a neat sketch explain the working principle of Auto Collimator. [8M]
b) Explicate the uses of interferometer in measuring flatness of surfaces. [8M]

5 a) Explain the construction and working of Sigma mechanical comparator with a neat sketch. [10M]
b) State and explain the methods of measuring primary texture of a surface. [6M]

6 a) What are the various errors in screw threads? Discuss sources of these errors and precautions need to minimize or completely eliminate these errors. [8M]
b) Explain with a schematic sketch' the method of checking the in volute gear tooth profile. [8M]

7 a) State various applications of straight edges. [6M]
b) What are the various alignment tests performed on vertical milling machine and discuss any two of them in detail. [10M]

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