Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2130305 **Date:06/01/2017**

Subject Name:Analog Circuits-I

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.**

MARKS

Q.1 **Short Questions** **14**

1 What circuit activity may shift a characteristic curve so that diode operating points are different?
(a) higher power (heat) (c) lower voltage
(b) higher resistance (d) lower current

2 In a power supply diagram, which block indicates a smooth dc output?
(a) Transformer (c) rectifier
(b) Filter (d) regulator

3 With a half-wave rectified voltage across the load resistor, load current flows for what part of a cycle?
(a) 0 degrees (c) 180 degrees
(b) 90 degrees (d) 360 degrees

4 When transistors are used in digital circuits they usually operate in the:
(a) active region (c) saturation and cutoff regions
(b) breakdown region (d) linear region

5 What is the current gain for a common-base configuration where I_E = 4.2 mA and I_C = 4.0 mA?
(a) 16.80 (c) 0.20
(b) 1.05 (d) 0.95

6 Which is beta's current ratio?
(a) I_C/I_B (c) I_B/I_E
(b) I_C/I_E (d) I_E/I_B

7 Which is the higher gain provided by a C-E configuration?
(a) Voltage (c) resistance
(b) Current (d) power

8 A "U" shaped, opposite-polarity material built near a JFET-channel center is called the:
(a) Gate (c) drain
(b) Block (d) heat sink

9 When a number of stages are connected in parallel, the overall gain is the product of the individual stage gains.
(a) True (b) false

10 A Schmitt trigger is
(a) a comparator with only one trigger point.
(b) a comparator with hysteresis.
(c) a comparator with three trigger points.
(d) none of the above.

11 In a(n) _____, when the input voltage exceeds a specified reference voltage, the output changes state.

(a) Integrator (c) differentiator
(b) summing amplifier (d) comparator

12 What is the Output of to integrator if the input is Step signal?

13 An op-amp has an open-loop gain of 90,000. V_{sat} = ±13 V. A differential voltage of 0.1V $_{p-p}$ is applied between the inputs. What is the output voltage?

(a) 13 V (c) -13 V
(b) 13 V_{p-p} (d) 26 V_{p-p}

14 Define CMRR.

Q.2 (a) How to calculate bulk resistance? **03**

(b) Explain V-I characteristics of Diode. **04**

(c) Explain Bridge rectifier in detail. **07**

OR

(c) Explain Zener diode with its applications. **07**

Q.3 (a) Draw circuit diagram of Positive and Negative Bias Series Clipper. **03**

(b) Explain Scaling amplifier with three inputs using OP-Amp. **04**

(c) Explain close–loop non-inverting configuration of OP-Amp. **07**

OR

Q.3 (a) Explain positive Clamper circuit. **03**

(b) Explain input-output characteristics of CB configuration of BJT. **04**

(c) Explain Emitter bias of Transistor. **07**

Q.4 (a) With a block diagram, explain difference between voltage shunt and series feedback. **03**

(b) Explain characteristic of JFET. **04**

(c) Describe construction and working of Depletion Mode MOSFET. **07**

OR

Q.4 (a) Differentiate between Enhancement and Depletion mode MOSFET. **03**

(b) Describe application of open-loop configuration of OP-Amp. **04**

(c) Write short note on Differentiator. **07**

Q.5 (a) In the inverting configuration of summing amplifier, Va=1V, Vb=2V, Vc=3V, Ra=Rb=Rc=3kΩ, Rf=1kΩ, and supply voltage =±15V. determine output voltage Vo. **03**

(b) In the Astable multivibrator, R_A=2.2kΩ, R_B=3.9kΩ, and C=0.1µF.Determine the positive pulse width t_c, negative pulse width t_d, and free-running frequency f_0. **04**

(c) Write short note on Sample and hold circuit. **07**

OR

Q.5 (a) In the non-inverting configuration of summing amplifier, Va=2V, Vb=4V, Vc=6V, Ra=Rb=Rc=1kΩ, Rf=4kΩ, R1=2kΩ and supply voltage =±15V. determine output voltage Vo. **03**

(b) Explain Astable Multivibrator work as Square wave generator. **04**

(c) Explain Log and Antilog amplifier using OP-Amp. **07**

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