

# V. P. & R. P. T. P. SCIENCE COLLEGE

Vallabh Vidyanagar

Internal Test

BSc [Semester - V] Subject: Physics Course: US05CPHY05

Title: Analog Devices and Circuits

Date: 07-10-2017, Saturday

Time: 11 am to 12.30 pm

Total Marks 25

**Q-1 Multiple Choice Questions: [One mark each] 3**

[i] Compared to a bipolar transistor, the JFET has a much higher  
(a) Voltage gain (b) Input resistance (c) Current gain (d) None of these

[ii] In CE amplifier, current gain in term of hybrid parameters is  
(a)  $A_i = \frac{-h_{fe}}{1+h_{oe} R_L}$  (b)  $A_i = \frac{h_{fe}}{1+h_{oe} R_L}$  (c)  $A_i = \frac{h_{fe}}{1-h_{oe} R_L}$  (d)  $A_i = \frac{h_{oe}}{1-h_{fe} R_L}$

[iii] The conversion efficiency of class-A transformer coupled power amplifier with resistive load is \_\_\_\_\_  
(a) 25 % (b) 50 % (c) 78.5 % (d) 70 %

**Q-2 Answer any two questions in short. [Two marks each] 4**

[A] Write full form of (i) JFET and (ii) MOSFET and (iii) CMOS.

[B] Write any four-amplifier equations of an amplifier circuit.

[C] If  $h_{fe} = 100$  and  $f_{\beta} = 300$  MHz, then calculate gain bandwidth product ( $f_T$ ).

**Q-3 Draw and discuss drain curves and transconductance curves of FET. 6**

OR

**Q-3 Discuss two types of JFET analog switch. 6**

**Q-4 Explain : (i)  $\alpha$  cut of frequency and (ii)  $\beta$  cut off frequency. 6**

OR

**Q-4 Discuss effect of coupling capacitor and bypass capacitor on low-frequency response of CE transistor amplifier. 6**

**Q-5 Describe an operation of class A push pull amplifier and discuss theory of operation of a class A push pull amplifier. 6**

OR

**Q-5 Describe an operation of class B push pull amplifier and class AB push pull amplifier. 6**

