Exam TY / Biomedical / Electronic circuits Analysis / S.H. 2012 BIO
B. Design - II

IN-RT-Exam-Oct-12-68

Con. 7830–12. 7/1/12 (Biom) KR–7259

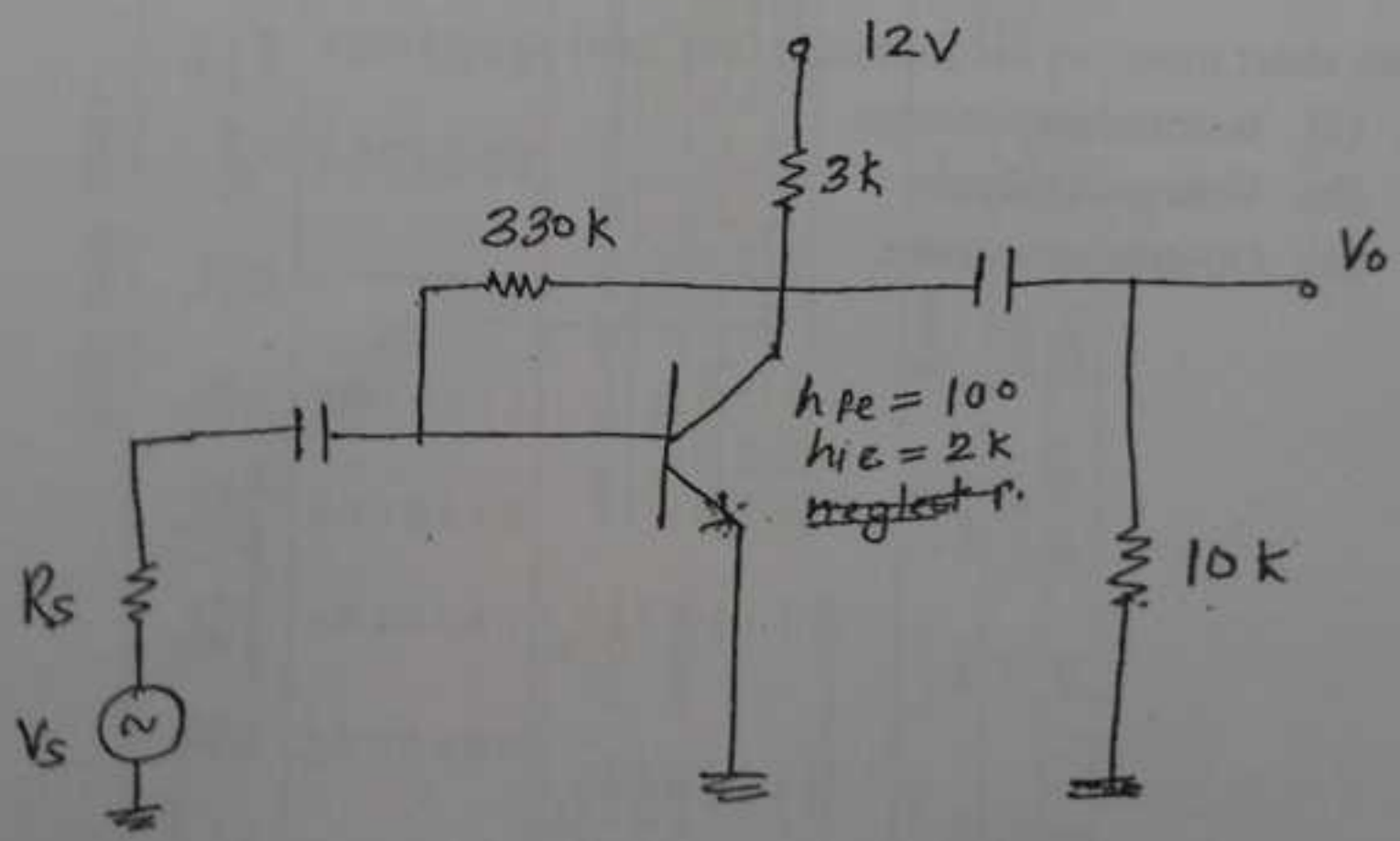
(3 Hours) [Total Marks : 100

N.B. : (1) Question No.1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume **suitable** data if **required**.

1. (a) State and explain Barkhausen criterion. 5
(b) Differentiate class A and B power amplifier 5
(c) Explain concept of virtual ground. 5

2. (a) Design class A power amplifier to provide 2 W power to the speaker of 4o W. 12
(b) Design a regulated power supply which will output +5 and –5 voltage. 5

3. (a) Compare the different types of negative feedback. 10
(b) Determine A_{vf}, R_{if}, R_{of} using –ve feedback approach. 10



4. (a) Design a linear combination of circuit using Op-amp to combine three sig and give output as, $V_0 = -2V_1 - 8V_2 - V_3$. All resistance values should be ≤ 200 K. 10

(b) In an integrator circuit $R_1 = 500\ \Omega$, $R_f = 5K$, $C = 0{\cdot}1\ \mu f$. If i/p signal period is $T = 0{\cdot}5$ ms. Then find the frequencies f_a and f_b. Also comment whether the circuit can work as an integrator. Mark f_a and f_b on integrator frequency response. 10

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5. State the circuit that can be used for the given application. Draw its circuit diagram and explain it – 20

   (a) A circuit which rectifies sine wave in mv amplitude.
   (b) A circuit which generates a sine wave signal of fixed frequency.
   (c) A circuit used to convert any form of the signal into a square wave.
   (d) A circuit which subtracts two signals.

6. (a) Derive max possible efficiency for class B transformer coupled power amplifier at max power O/P. 10

   (b) Design a suitable heat sink for the following applications :– 10

   Transistor – ZN 3055

   Actual power dissipation in transistor = 50 W

   Thermal resistance case to heat sink = θ_{C-H} = 0·5 °C/W.

   Ambient temperature = 40 °C

7. Write short notes on the following (any **two**) :– 20

   (a) Instrumentation amps.
   (b) Voltage regulators
   (c) Op-amp parameters.
