This question paper contains 4 printed pages.]

8475 *Your Roll No. .....*

B. Tech. (EEE) / I **A**

Paper EEE–105

ADVANCED ELECTRONICS

Time : 3 Hours *Maximum Marks : 70*

(Write your Roll No. on the top immediately on receipt of this question paper.)

*Answer any **five** questions.*

Assume suitable missing data, if any.

1. (a) Define the parameters : Amplification factor, drain resistance and mutual conductance for JFET and derive the relationship among these factors. 7

(b) A transistor amplifier circuit shown in fig-1 has the following parameters hie = 1500 Ω, hfe = 100, hre = 4×10^{-4} hoe = 4×10^{-4} mho. Determine the ac input resistance of the amplifier and voltage gain. 7

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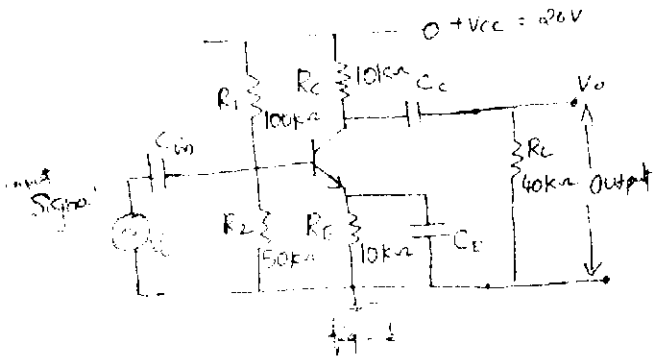

Fig - 1

2. (a) Draw a self bias BJT circuit and derive the expression for δ (I_{CO}) and δ (V_{BE}). Suggest a method for improving the stability of the circuit. 7

(b) Explain the construction and working of a MOSFET with the help of a neat diagram. Draw the input and output characteristic of an Enhancement MOSFET in common source configuration. 7

3. (a) Explain different feedback configuration with example. 7

(b) Explain in detail the working of R-C phase shift oscillator and derive the expression for frequency of oscillation. 7

4. (a) Using a neat sketch derive the expression for voltage gain, current gain and output resistance of a High frequency voltage Amplifier (BJT). (You can use either h-parameter model or π-model.) 7

(b) Explain the advantages of a negative feedback amplifier over positive feedback amplifier. 3

(c) An amplifier has gain A = 60 dB and output impedance Zo = 12.6 K Ω. It is required to modify its output impedance to 600 Ω by applying negative feedback. Determine (a) the value of feedback factor (b) the percentage change in the overall gain for 10% change in gain of the basic amplifier. 4

5. (a) The efficiency of class C amplifier is much higher than class-A amplifier prove the above statement. 7

(b) Explain the working of a push-pull amplifier with the help of a neat sketch. Also explain its advantages. 7

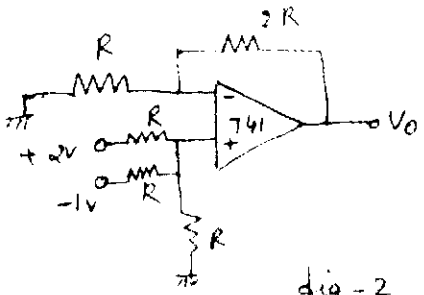

Fig - 2

6. (a) Fig-2 shows a non inverting op-amp summer with V_1 = 2V and V_2 = 1V. Calculate output voltage V_0. Derive the equations used. 7

(b) Draw the circuit diagram of a low pass filter and high pass filter using op-amp and explain its working. 7

7. Write short notes on any two : 7×2=14

(i) 555 timer

(ii) Common base input and output characteristic

(iii) Schmitt trigger

(iv) Emitter coupled differential amplifier