V.P. & R.P.T.P. SCIENCE COLLEGE VALLABH VIDYANAGAR

Third Semester B.Sc. Internal Examination

Subject: **Physics** Course: **US03CPHY22**

Date: 03 -10-2019, Thursday Time: 3:00 to 4:15 pm Total Marks:25

Q-1 Answer the following MCQ's with correct option. (1 Mark each) **(5)**

1 A good biasing circuit should establish the operating point on a load line ....
(a) near saturation region (b) near cut-off region
(c) at middle of active region (d) outside active region

2 Which of the following h-parameter represents forward current gain of a CE transistor ?
(a) h_{fe} (b) h_{ie} (c) h_{re} (d) h_{oe}

3 The voltage gain of an emitter follower is ....
(a) less than 1 (b) greater than 1 (c) equal to 1 (d) none of above

4 The JFET is a ..... device.
(a) bipolar (b) unipolar (c) tripolar (d) metaalic

5 The slope of a dc load of a CE amplifier with collector resistor R_C is equal to
(a) R_C (b) $1/R_C$ (c) $R_C/2$ (d) $2R_C$

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Answer the following questions. (5 Mark each)

Q-2 With proper example explain determination of operating point of a Fixed bias circuit. **(5)**

OR

With proper example explain determination of operating point of Voltage divider biasing circuit using approximate analysis method.

Q-3 Using equivalent circuit method, explain development of transistor equivalent circuit. **(5)**

OR

What are h parameters? Define them. Explain development of h-parameter equivalent circuit for CE transistor.

Q-4 Explain how the negative feedback in an amplifier helps to: **(5)**
(i) Stabilize the gain and (ii) Increase input impedance.

OR

Write notes on: (i) Harley Oscillator and (ii) Colpitts Oscillator

Q-5 Explain structure and basic operation of a JFET. Draw the drain curves and explain pinch-off voltage, ohmic resistance and gate-source cut-off voltage. **(5)**

OR

Discuss applications of JFET as (i) JFET Amplifiers and as (ii) an analog series and shunt switch.

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