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**SUBJECT CODE NO: - Y-2033**  
**FACULTY OF SCIENCE AND TECHNOLOGY**  
**B.Sc. S.Y (Sem.-IV)**  
**Examination March / April - 2023**  
**Physics Paper-XI (General Electronics)**

[Time: 1.30 Hours]

[Max. Marks: 50]

Please check whether you have got the right question paper.

N. B

- 1) Attempt all questions.
- 2) Use of algorithmic table and calculator is allowed.

Q1 a) What is field effect transistor? Explain the construction and drain characteristics of P- channel JFET. 10

b) With neat circuit diagram explain the working of an RC coupled amplifier with special reference to frequency response. 10

**OR**

a) With neat circuit diagram, explain the working of Bistable multivibrator & explain how it works as a frequency divider. 10

b) What is amplitude modulation? Draw the wave form of Am and discuss the side bands produced in it. 10

Q2 a) What is Zener diode? Explain avalanche and Zener break down. 05

b) Find  $I_B$  and  $\beta_{d.c.}$  for a transistor if emitter current is 9 mA and collector current is 8.85 mA. 05

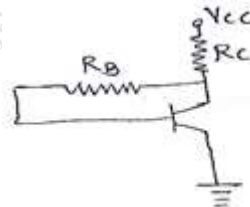
c) What is oscillator? Explain the condition for oscillations. 05

d) Calculate the Frequency of Hartley oscillator if  $L_1 = L_2 = 20$  mH and  $C = 0.008$   $\mu$ F. 05

**OR**

a) What is OP- AMP? Explain the characteristics of an ideal OP- Amp. 05

b) It is desired to set the operating point at 2V, 1mA by biasing a silicon transistor with feedback resistance  $R_B$ . If  $\beta = 100$ , find the value of  $R_B$ . 05



c) Discuss advantages of frequency modulation. 05

d) An audio signal of 2KHz is used to modulate a carrier of 600 KHz. Determine 05

- i. Side band frequencies
- ii. Band width required.

## Q3 Multiple choice question.

1. Operating point mean \_\_\_\_\_.
  - a) Zero signal  $I_E$  and  $V_{CE}$
  - b) Zero signal  $I_E$  and  $V_{BE}$
  - c) Zero signal  $I_C$  and  $V_{CE}$
  - d) None of these.
2. Common collector arrangement of transistor is generally uses for \_\_\_\_\_.
  - a) Gain matching
  - b) Impedance matching
  - c) Capacitance matching
  - d) None of these.
3. If the Pn junction is heavily doped, breakdown voltage will \_\_\_\_\_.
  - a) Increase
  - b) Decrease
  - c) Remains constant
  - d) None of these.
4. The collector leakage current is strongly depends on \_\_\_\_\_.
  - a) Voltage
  - b) Current
  - c) Temperature
  - d) Temperature
5. An inverting op – Amp has input resistance 200 k $\Omega$  , feedback resistance of 2m $\Omega$ , then gain A is \_\_\_\_\_.
  - a) -15
  - b) -10
  - c) 6
  - d) 8
6. The band width is obtain at range of frequency over which the gain is equal to greater than \_\_\_\_\_ of the maximum gain.
  - a) 70.7%
  - b) 60.7%
  - c) 75.5 %
  - d) None of these
7. In phase shift oscillator, the frequency determining elements are \_\_\_\_\_.
  - a) R and L
  - b) L and C
  - c) R and C
  - d) None of these
8. A stable multivibrator circuit can be used as \_\_\_\_\_.
  - a) Squaring circuit
  - b) Comparator circuit
  - c) Voltage to frequency converter
  - d) Frequency to voltage converter
9. Noise problem occurs in \_\_\_\_\_ modulation.
  - a) Frequency
  - b) Amplitude
  - c) Phase
  - d) None of these.
10. In frequency modulation, the amplitude of the modulating signals determines \_\_\_\_\_.
  - a) Amplitude of frequency shift
  - b) Distance of broad cast
  - c) Rate of frequency deviation
  - d) Tonal balance of transmission .