Total No. of Printed Pages: 3

SUBJECT CODE NO: - Y-2171

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc. (PATTERN-2013) (S.Y SEM IV)

Examination April / May - 2024

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 Logarithmic table and calculator is allowed.

Q.1 a) Explain with neat circuit diagram, input and output characteristics of common base configuration of transistor. **10**

b) What is op- Amp? Explain how Op-Amp works as a subtractor. **10**

OR

a) What is phase shifting network? With neat circuit diagram, explain the working of phase shift oscillator. **10**

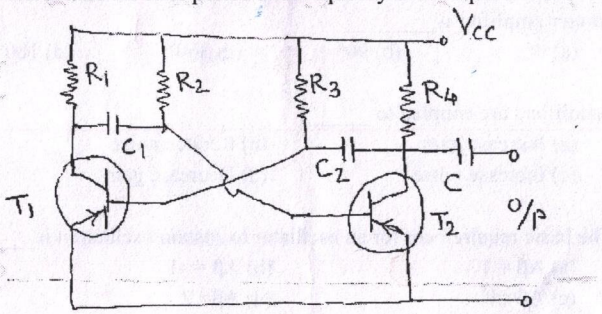
b) What is phase modulation? Derive an expression for phase modulated wave. **10**

Q.2 a) Distinguish between Bipolar junction transistor (BJT) and Field effect transistor (FET). **5**

b) For an N-channel JFET, I_{DSS} = 8.2MA, and V_p =-3V And V_{GS}= -1 V. Find the Value of I_D. **5**

c) What is feedback? Explain positive feedback. **5**

d) In the astable multivibrator, $R_2 = R_3 = 10\ k\Omega$ and $C_1 = C_2 = 0.01\ \mu f$ Determine the time period and frequency of the square wave. **5**



OR

a) Discuss merits and demerits of RC coupled amplifier. **5**

b) A transistor uses potential divider method of biasing. calculate the collector current if voltage across R_2=4Y, V_{BE} = 0.7V and R_E = 2KΩ, **5**

c) What are the limitations of amplitude modulation? **5**

d) A sinusoidal carrier voltage of frequency 1 MHz and amplitude 200 V is amplitude modulated by sinusoidal Voltage of frequency of 4 kHz producing 40% modulation, calculate the frequency and amplitude of lower and upper sideband terms. **5**

Q.3 Multiple choice questions. **10**

1) A zener diode should have _____
   (a) Narrow depletion region (b) Lightly doped p and n region
   (c) Heavily doped p and n region (d) Both a and c.

2) As the temperature of a transistor goes up, the base-emitter resistance___
   (a) Increases (b) Decreases
   (c) Remains constant. (d) None of these

3) A MOSFET is sometimes called as_____JFET.
   (a) Open gate (b) Short gate
   (c) Insulated gate (d) None of these.

4) The value of stability factor for a base resistor bias method is _____
   (a) (1-β) (b) (1+ β) R_B
   (c) (1+ β) (d) (1+ β) Rc

5) The phase difference between the output and input voltage of a common emitter amplifier is_____
   (a) 0° (b) 90° (c) 360° (d) 180°

6) Amplifiers are coupled to _____
   (a) Increase gain (b) Reduce noise
   (c) Increase noise (d) Decrease gain

7) The basic requirement for an oscillator to sustain oscillation is____
   (a) Aβ = 1 (b) Aβ = -1
   (c) Aβ= 0 (d) Aβ= 2

8) In the Hartly oscillator circuit if L_1 = 100 μH, L_2= 1 MH and mutual inductance between the coils, M = 20 μH, then total inductance is_____

(a) 1140 μH (b) 1250 μH

(c) 1030 μH (d) None of these

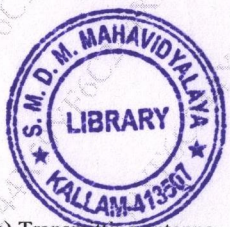
9) In amplitude modulated wave equation, the sum of carrier frequency and signal frequency is called _____

(a) Lower side band frequency.

(b) Upper side band frequency

(c) Carrier frequency,

(d) None of these.



10) Demodulation is done in _____

(a) Receiving antenna (b) Transmitting antenna

(c) Transmitter (d) Radio receiver.