

(i) Printed Pages: 2

Roll No.

(ii) Questions : 7

Sub. Code :

0	5	4	5
---	---	---	---

Exam. Code :

0	0	0	6
---	---	---	---

B.A./B.Sc. (General) 6th Semester

(2042)

PHYSICS

Paper—B : Electronics and Solid State Devices-II

Time Allowed : Three Hours]

[Maximum Marks : 44

Note :— Attempt **five** questions in all, including Question No. 7 (Unit-III) which is compulsory and selecting *two* questions each from Units I and II. Use of non-programmable calculator is allowed.

UNIT—I

1. (a) Bring out the difference between enhancement MOSFET and depletion MOSFET. Describe the characteristics of MOSFET. 6
(b) "A BJT is a current controlled device while a FET is a voltage controlled device." Justify. 3
2. (a) Discuss the action of an emitter follower. How much feedback percentage is present in an emitter follower ? 6
(b) An amplifier has a current gain of 200 and a bandwidth of 400 kHz without feedback. If negative current feedback ($\beta=0.01$) is applied, what is the bandwidth of the amplifier ? 3
3. Draw the circuit of Wein-bridge oscillator. Explain its principle and working and find an expression for the frequency of oscillations. 9

UNIT—II

4. (a) Draw and explain the characteristics of an ideal OPAMP. Discuss its application as a voltage comparator. 6
(b) An amplifier with an open loop gain of 25 is subjected to a negative feedback of 10%. If the open loop gain increases by 5%, find the percentage change in the gain with feedback. 3
5. How an IC555 is connected as astable multivibrator ? Explain its working. Also derive the relations for total time, frequency and duty cycle. 9
6. (a) What do you mean by frequency modulation ? Derive an expression for FM wave with sinusoidal modulation and find the expression for frequency modulation index. 6
(b) What is the power developed by an AM wave in a load of 200 ohm, when peak voltage of the carrier is 120 V and modulation factor is 0.5 ? 3

UNIT—III

Note :— Attempt any *eight* of the following.

7. (a) List the parameters of FET. How are they related to each other ?
(b) What is the need for modulation ?
(c) What are the applications of emitter follower ?
(d) Simplify the expression.
(e) Why is radio reception better at nights ?
(f) What are the advantages of negative feedback ?
(g) Define common mode rejection ratio.
(h) What is selective fading ?
(i) What is XNOR gate ? Draw its logic symbol.
(j) What is the Barkhausen criterion for sustained oscillations ? $8 \times 1 = 8$