

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2019

First Degree Programme under CBCSS

Physics

Core Course VII

PY 1543 – ELECTRONICS

(2014 Admission onwards)

Time : 3 Hours

Max. Marks : 80

SECTION A

Very short answer type questions (Answer all 10 questions of 1 mark each)

1. What is an ideal diode?
2. Which are the most commonly used semiconductors and why?
3. Define power rating of a transistor.
4. What is stability factor of a transistor?
5. Define distortion of a power amplifier.
6. Equation gain of amplifier with negative feedback.
7. The frequency of oscillation of colpitts oscillator is _____.
8. What is modulation factor?
9. Why UJT is called double based diode?
10. What is the input stage of amp?

(10 × 1 = 10 Marks)

SECTION – B

*Short answer type questions (Answer any **eight** questions of **2** marks each)*

11. What is a voltage follower? And draw its circuit diagram.
12. Explain the features of an ideal amplifier.
13. Draw the equivalent circuit of SCR.
14. What are the advantages of LED?
15. Write a short note on demodulation.
16. Draw the frequency spectrum of AM wave,
17. What are the advantages and disadvantages of wein-bridge oscillator'?
18. What are the effects of negative feedback on amplifiers?
19. Explain the working of practical power amplifier with the help of block diagram.
20. Explain the transistor biasing and its need.
21. With the help of circuit diagram. explain the working of full wave bridge rectifier.
22. Write short note on zener breakdown.

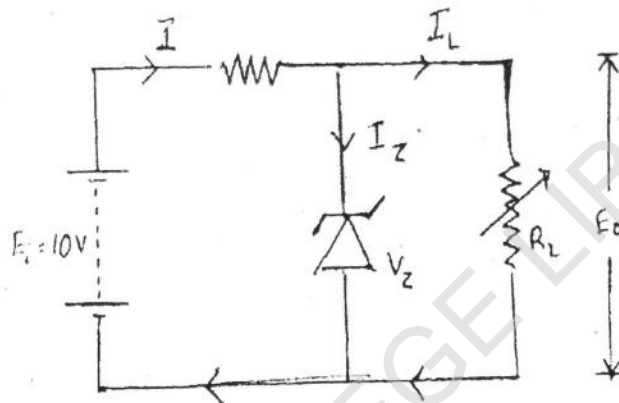
(8 × 2 = 16 Marks)

SECTION – C

*Answer any **six** questions. Each question carries **4** marks*

23. An ac. supply of 240V is applied to a half wave rectifier through a transformer of turn ratio 20:1. Find (i) The output d.c. voltage, (ii) The peak inverse voltage assume the diode to be ideal
24. Four diode used in a bridge rectifier circuit have forward resistance which may be considered at $1\ \Omega$ and infinite reverse resistance. The a.c. input voltage is 240V r.m.s and load resistance is $480\ \Omega$. Calculate (i) mean load current and (ii) power dissipated in each diode.

25. A power supply A deliver 20V dc with ripple of 0.5 V r.m.s while the power supply B delivers 25 V d.c with a ripple of 10 mV r.m.s; which is better power supply.
26. A 6.4V zener is used in the circuit as shown in figure and load current is to vary from 12 to 100 mA. Find the value of series resistance R to maintain a voltage of 7.2V across the load. The input voltage is constant at 10V and the minimum zener current is 10mA.



27. What value of series resistor is required to limit the current through a LED to 30mA with a forward voltage drop of 1.8V when connected to a 12 V supply?
28. Calculate the value of I_g in a transistor for which $\beta = 80$ and $I_B = 20\mu A$.
29. For a certain transistor. $I_B = 20\mu A$. $I_C = 2mA$. $\beta = 80$. Calculate the leakage current I_{CBO}
30. A transistor uses potential divider method of biasing $R_1 = 100k\Omega$. $R_2 = 20k\Omega$ and $R_E = 1k\Omega$. Find the value of I_C ; given $V_{BE} = 0.3V$
31. Find the capacitance of the capacitor required to build an LC oscillator that uses an inductor of $L = 1mH$ to produce a sine wave of frequency 1GHz.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Each question carries **15** marks

32. With the help of circuit diagram explain the principle and working of half wave rectifier and full wave bridge rectifier. Compare its efficiency and ripple factor with proper equations.
33. With the help of circuit diagram explain the operation of a transistor as an amplifier and also explain the necessity for negative feedback.
34. Describe the various methods used for transistor biasing. State their advantages and disadvantages.
35. Discuss the essentials of an oscillator and also discuss the circuit operation of tuned collector oscillator.

(2 × 15 = 30 Marks)