

D 10684

(Pages : 3)

Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Physics/Applied Physics

PHY 5B 09/APH 5B 09—ELECTRONICS (ANALOG AND DIGITAL)

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

The symbols used in this question paper have their usual meanings.

Section A

*Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Define ripple factor of a rectifier. What is its value for a full wave rectifier ?
2. Explain the working of a π -filter.
3. Mention the merits of R-C coupled amplifiers.
4. Explain the decibel system of expressing power gain.
5. What is the role of a coupling capacitor in a multistage transistor amplifier ?
6. List down the advantages of negative feedback.
7. Define Common Mode Rejection Ratio (CMRR).
8. Explain the principle of an op-amp differentiator.
9. Convert the following decimal numbers into its binary equivalents.
 - (a) 13.7.
 - (b) 0.85.
10. Subtract 1010 from 1101 using 1's complement method.
11. Why NAND gate is called 'a' universal gate ?
12. What is meant by toggle condition in JK flip flops ?

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least five questions.

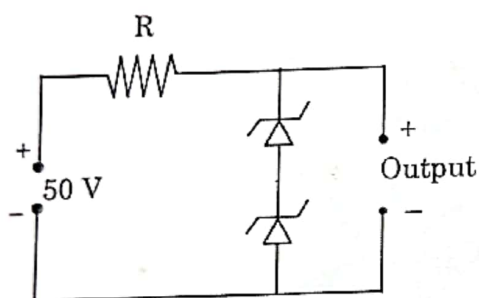
Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. The circuit uses two zener diodes, each rated 15 V, 200 mA. If the circuit is connected to a 50 Volt unregulated d.c. supply. Determine

- The regulated output voltage.
- The value of series resistance R.



14. Draw the input and output characteristics of Common Emitter (CE) configuration. What are the inferences?
15. For the transistor amplifier shown in figure :

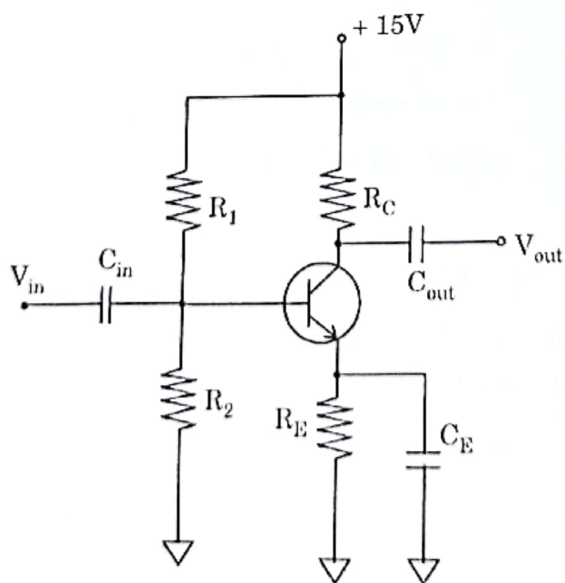
$$R_1 = 10 \text{ k}\Omega$$

$$R_2 = 5 \text{ k}\Omega$$

$$R_C = 1 \text{ k}\Omega$$

$$R_E = 2 \text{ k}\Omega$$

$$V_{BE} = 0.7 \text{ Volt}$$



- (i) Draw the d.c. loadline.
(ii) Determine the operating point.
16. With a negative voltage feedback, an amplifier gives an output of 10 V with an input of 0.5 V. When feedback is removed, it requires 0.25 V input for the same output. Calculate : (i) Gain without feedback ; (ii) Gain with feedback ; and (iii) Feedback fraction.
17. A phase shift oscillator uses $0.01 \mu\text{F}$ capacitors. Find the value of Resistance R to produce a frequency of 800 Hz.
18. Describe the principle of a summing amplifier using op-amp.
19. Compute the following using 2's complement method :
(a) $25 - 18$. (b) $9 - 12$.

(5 × 5 = 25 mark)

Section C (Essay Type)

Answer any **one** question.

The question carries 11 marks.

20. Describe voltage divider biasing in detail. Explain how stability is achieved in this method.
21. Explain the principle of a full adder with suitable diagrams and truth table.

(1 × 11 = 11 marks)