18U509   (Pages: 2)   Name………………………

Reg. No……………………

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2020

(CUCBCSS-UG)

(Regular/Supplementary/Improvement)

CC15U PH5 B09 - ELECTRONICS (ANALOG & DIGITAL)

(Physics- Core Course)

(2015 Admission onwards)

Time : Three Hours   Maximum : 80 Marks

Section A

Answer *all* questions in a word or a phase. Each question carries 1 mark.

1. The ripple factor of a full wave rectifier is ------------

2. A zener diode is used in ------------bias for voltage regulation.

3. The most commonly used transistor configuration is ------------

4. What is the point of intersection of dc and ac load line?

5. In a negative feedback amplifier, voltage gain ------------

True or False.

6. The electrical equivalent of mass is capacitance.

7. In an AM wave, majority of power is in carrier wave.

8. In digital modulation, pulse code modulation is used.

9. All binary numbers can't be converted to decimal numbers.

10. Octal is not a positional number system.

(10 × 1 = 10 Marks)

Section B

Answer *all* questions in two or three sentences. Each question carries 2 marks.

11. Discuss the working of capacitor input filter.

12. Explain how a voltage quadrupler works.

13. Draw the circuit diagram of a common emitter configuration.

14. What is the advantage of expressing gain in decibels?

15. What is the need of the modulation?

16. Convert the decimal 45 into binary equivalent.

17. State and illustrate De-Morgan's theorems.

(7 × 2 = 14 Marks)

Section C

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

18. Explain the working of a full wave rectifier.

19. Deduce the expression for power gain, current gain and voltage gain.

20. Discuss the function of transformer in a transformer coupled amplifiers.

21. What is the advantage of frequency modulation over amplitude modulation?

22. Explain the working of E-MOSFET.

23. Explain the BCD representation with examples.

24. What is the raising condition in a JK flip flop? How it is rectified?

<div align="right">**(5 × 4 = 20 Marks)**</div>

Section D
Answer any *four* questions. Each question carries 4 marks.

25. A 6V zener diode is connected with a voltage source of 10V and a resistance R. The current through the load resistance R_L varies from 10 to 100 mA. Find the value of series resistance R for maintaining a voltage of 7V across the load R_L. The minimum zener current is 8 mA.

26. Draw the dc load line for common emitter configuration having $V_{cc} = 10V$, $R_c = 5$ kΩ. What will be the Q point if the zero signal base current is 15 μA and $\beta = 50$?

27. What is the gain in dB for an increase of power from 30W to 60W?

28. After amplitude modulation, the r.m.s value of carrier wave change from 80V to 65V. Calculate the modulation index.

29. When the drain current of a JFET changes from 0.9 mA to 1.2 mA, V_{gs} changes from -2.6V to -2.3V. Find the value of transconductance.

30. Subtract 8 from 9 using two complement method in 8 bit format.

31. With gated diagram, discuss the working of a full adder.

<div align="right">**(4 × 4 = 16 Marks)**</div>

Section E
Answer any *two* questions. Each question carries 10 marks.

32. What is the requirement of biasing in a transistor amplifier? Explain different types of biasing techniques.

33. What are the essentials of a transistor oscillator? Discuss the working of a 1) Colpitt's oscillator and 2) crystal oscillator.

34. What are the advantages of an OPAMP? Explain the working of an OPAMP integrator and differentiator.

35. Explain Karnaugh Map. Explain pair's quad and octet with examples.

<div align="right">**(2 × 10 = 20 Marks)**</div>

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