18P109   (Pages: 2)   Name: …………………….

Reg. No…………………...

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2018
(Regular/Supplementary/Improvement)

(CUCSS-PG)

CC17P PHY1 C04 – ELECTRONICS

(Physics)

(2017 Admission onwards)

Time: Three Hours   Maximum: 36 Weightage

Part A
Answer *all* questions. Each question carries 1 weightage.

1. What is the importance of transconductance curve? Which are the parameters associated with this curve?

2. Explain the working of FET as a VVR.

3. Drawing the static current voltage characteristic of the tunnel diode, marking the region of its working.

4. Which are the parts of an injection laser? How they differ from other lasers?

5. What are the characteristics of Butterworth filter over other filters?

6. Write down the principle of Bode plots?

7. Give the working of a astable multivibrator using opamp.

8. What do you mean by pole and lead compensation?

9. Give any one application of a V-I converter.

10. Give the defenitions for CMRR and slewrate.

11. How do you differentiate JK and MSJK flip flops?

12. Explain the terms CMOS and NMOS.

(12 x 1 = 12 Weightage)

Part B
Answer any *two* questions. Each question carries 6 weightage.

13. Explain the working of

    (a) Common source amplifier with an application.

    (b) p-n junction solar cells with its charecteristics.

    (c) Digital MOSFET circuit.

14. Explain the theory and working of Schmidt trigger with the help of circuit diagrams and input and output wave forms.

15. Distinguish between first order and second order filters. Discuss with theory the working of first order and second order low pass filter.

16. How counters are classified? Describe the working of MOD10 counter, with proper wave diagram, truth table and circuits.

(2 x 6 = 12 Weightage)

Part C
Answer any *four* questions. Each question carries 3 weightage.

17. Give the order of magnitude of $g_m, r_d,$ and μ for a MOSFET. How depletion MOSFET differs from enhancement MOSFET?

18. Give the working principles of photoconductor, photodetector and photodiode.

19. If an input voltage of 2V DC is applied to an integrator for a time less than 4 seconds, determine the output voltage and sketch it. The RC value is 1 second.

20. Find the output voltage of a summer circuit having four input voltages +2, +3, +5 and +6 Volts applied to the inverting input. Select all the resistances as equal.

21. Determine the center frequency, maximum gain and bandwidth for the filter with R_1 68kΩ, R_2 180kΩ, R_3 2.7kΩ and capacitances C1 and C2 equal to 0.01μF.

22. What is a full adder? Draw the Karnaugh maps for the outputs of a full adder and give their realization using NAND gates.

(4 x 3 = 12 Weightage)

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