N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : NOVEMBER – 2024

M.Sc. – PHYSICS   **MAXIMUM MARKS: 75**

I SEMESTER   **TIME : 3 HOURS**

APPLIED ELECTRONICS

SECTION – A   (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.   (K1)

1.   The controlling parameter in MOSFET is

   (a) V_{gs} (b) I_g (c) I_s (d) V_{ds}

2.   Negative feedback in amplifier

   (a)   improves signal to noise ratio at input

   (b)   improves signal to noise ratio at output

   (c)   reduce distortion

   (d)   does not improve the signal to noise ratio at I/O

3.   Voltage gain of an OP AMP is

   (a) Infinite   (b)   very high   (c)   low   (d)   very low

4.   A differential amplifier amplifies

   (a)   input signal at higher voltage   (b)   sum of input voltage

   (c)   Difference of two signals   (d)   input signal at low voltage

5.   A light emitting diode is

   (a)   heavily doped   (b)   lightly doped

   (c)   intrinsic semiconductor   (d)   zener diode

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES.   (K2)

6.   Give the two roles of capacitors in transistor amplifiers.

7.   Mention any two advantages of negative feedback.

8.   Define operational amplifier and its pin configuration.

9.   List any two characteristics of ideal non operational amplifier.

10.   Define " radiometric intensity".

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SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K3)

11. a) Sketch the characteristics of UJT and explain why it has negative resistance region.

(OR)

b) Describe the action of emitter follower with a neat diagram.

12. a) Derive the Barkhausen criteria for self-sustained oscillations.

(OR)

b) With a neat diagram, explain the principle of working and operation of a phase shift oscillator.

13. a) What are the characteristics of an ideal Operational Amplifier? Explain.

(OR)

b) Describe with circuit the working of an Op-Amp as Schmitt trigger

14. a) Explain common mode and differential mode operation of an OP-Amp..

(OR)

b) What are known as practical operational Amplifiers? How is it different from other types OP-Amp? .

15. a) Give a note on photo electric detectors.

(OR)

b) What are thermocouple? Explain it's working with an example.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Discuss with necessary theory and circuits, the working and frequency response of an RC coupled amplifier.

(OR)

b) Draw the circuit of a common drain FET amplifier with a resistance drain circuit. Explain the methods of biasing the FET.

17. a) Explain the working of a Colpit's oscillator. Derive the expression for the frequency condition of sustained oscillations

(OR)

b) Discuss the working of a monostable multivibrator with circuit diagram. .

18. a) Discuss the working of a i) Inverting OP-Amp .ii) Non-inverting OP-Amp .

(OR)

b) Explain the action of Comparator. Show how a Comparator is used as window detector circuit.

19. a) Explain the operation of differential amplifier in common mode and differential mode.

(OR)

b) Explain differential gain and common mode gain and hence define CMRR for an Op-Amp. If the numerical value of an Op-Amp is 100000, then what is the CMRR value in dB?

20. a) Describe device structure and working of Light emitting diode.

(OR)

b) What are the classifications of radiation detections? Explain their characteristics.

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