E 1499 (Pages : 3) Reg. No.....

Name.....

# B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2015

## Third Semester

Core Course—ELECTRONICS

(Common for B.Sc. Physics Model I, B.Sc. Physics Model II B.Sc. Physics EEM, B.Sc. Physics—Instrumentation)

[For 2011 and 2012 admission students]

Time : Three Hours Maximum Weight : 25

### Part A

*Answer* **all** *questions.*
*Objective type questions. Weight* 1 *for each bunch.*

BUNCH I

Choose the most appropriate alternative :

1. A p-n junction connected to an external voltage source is called a ———— p-n junction.
   (a) forward biased. (b) reverse biased.
   (c) biased. (d) none of these.
2. Wave shaping is used to generate ————.
   (a) one wave from the other. (b) Integration.
   (c) suppression. (d) non of these.
3. The voltage gain in a CC circuit is ————.
   (a) infinite. (b) one.
   (c) less than one. (d) greater than one
4. Negative feedback is the injection of a fraction of output in opposite phase to the ———— signal.
   (a) common. (b) input.
   (c) output. (d) none of these.

BUNCH II

5. The voltage at which the diode starts conducting is called ———— voltage.
   (a) cutoff. (b) knee.
   (c) diode. (d) none of these.
6. A clipping circuit has a provision for the adjustment of a clipping level is called a ———— clipper.
   (a) biased. (b) negative.
   (c) positive. (d) none of these.

Turn over

7. A ———— amplifier is one in which collector current flows for the entire a.c. cycle.

(a) Class B. (b) Class C.

(c) Class A. (d) none of these.

8. A transistor amplifier with proper positive feedback can act as ————.

(a) a Clipper. (b) a clamper.

(c) a power amplifier. (d) an oscillator.

BUNCH III

9. A voltage multiplier is a circuit which gives a greater d.c. output than ———— input voltage.

(a) a.c.. (b) d.c.

(c) a.c. and d.c. (d) reverse.

10. The ———— is always forward biased with respect to base in a transistor.

(a) base. (b) collector.

(c) emitter. (d) none of these.

11. FET is a ————Transistor.

(a) bipolar. (b) multipolar.

(c) unipolar. (d) none of these.

12. For an ideal operational amplifier the output impedance is ————.

(a) low. (b) high.

(c) very low. (d) zero.

BUNCH IV

13. Ripple frequency is ———— the frequency of the input.

(a) less than. (b) equal to.

(c) greater than. (d) none of these.

14. The output ———— of a CB circuit is very large.

(a) resistance. (b) current.

(c) amplification. (d) none of these.

15. MOSFET can operate with positive or negative ———— voltage.

(a) source. (b) drain.

(c) gate. (d) none of these.

16. An adder is the same as ———— amplifier with more than one input terminal.

(a) an inverting. (b) a non-inverting

(c) a feedback. (d) none of these

$(4 \times 1 = 4)$

## Part B

*Answer any* **five** *questions.*
*Weight* 1 *each.*

17. Explain the filtering action of a L and C.
18. In what aspects zener diodes differ from an ordinary diode ?
19. What is a clamper ? Explain.
20. Explain thermal runaway process.
21. What is voltage divider biasing ?
22. How does a MOSFET differ from a FET ? Explain.
23. What is an op-amp ?
24. What is demodulation ? Explain.

$(5 \times 1 = 5)$

## Part C

*Answer any* **four** *questions.*
*Weight* 2 *each.*

25. A power supply provides 100 mA at 20 V d.c. It uses a capacitance filtering and is driven from a 50 Hz source. Find the ripple factor for full wave rectification if C = 1000 $\mu$F.
26. Calculate the a.c. voltage required in order to supply 50 V d.c. to a resistance load of 800 ohms. The resistance of the diode is 25 ohm.
27. For a transistor $\beta$ = 45 and voltage drop across 1 kilo-ohm which is connected in the collector circuit is 1 volt. Find the base current for CE connection.
28. A power amplifier supplies 50 W to an 8 ohm speaker. Find the ac output voltage and ac output current.
29. When a negative feedback is applied the gain of the amplifier is reduced by 60%. Find the feedback ratio if the overall gain without feedback is 150.
30. An AM radio transmitter radiate 20 kW at modulated index 75%. Find carrier power.

$(4 \times 2 = 8)$

## Part D

*Answer any* **two** *questions.*
*Weight* 4 *each.*

31. Discuss the action of a voltage tripler and quadruples.
32. Give the practical circuit of a transistor amplifier and discuss the functions of each element. Distinguish between de load line and a.c. load line.
33. Describe the functioning of an op-amp as an adder. Explain the significance of virtual ground in a basic inverter amplifier.

$(2 \times 4 = 8)$