STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2011-12 & thereafter)

SUBJECT CODE: 11PH/MC/SE64

B.Sc. DEGREE EXAMINATION APRIL 2015
BRANCH III - PHYSICS
SIXTH SEMESTER

REG. No._____

COURSE : MAJOR – CORE
PAPER : SEMICONDUCTOR ELECTRONICS
TIME : 30 MINS. MAX. MARKS: 30

SECTION – A
TO BE ANSWERED IN THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: (30 x 1 = 30)

I Choose the Correct Answer:

1. Transistor can be classified into_____ types.
   a. two b. three c. four d. five
2. A transistor has_____ PN junctions.
   a. five b. four c. three d. two
3. The input impedance of a transistor is _____.
   a. zero b. low c. high d. infinity
4. An ideal value of stability factor is _____.
   a. zero b. one c. hundred d. infinity
5. The operating point is also called the _____.
   a. cutoff point b. end point
   c. saturation point d. quiescent point
6. Transistor biasing represents _____ conditions.
   a. d.c b. a.c. c. both d.c and a.c d. none of the above
7. R.C. coupling is used for _____ amplification.
   a. current b. sound c. power d. voltage
8. A JFET has three terminals, namely _____.
   a. anode, cathode, grid b. emitter, base, collector
   c. source, drain, gate d. $+V_{cc}$, GND, $-V_{cc}$
9. A JFET is also called _____ transistor
   a. unipolar b. bipolar c. tripolar d. unijunction
10. A UJT is a _____ terminal semiconductor device.
    a. one b. two c. three d. four
11. The output impedance of an ideal opamp is _____.
    a. 0 b. 1 c. 100 d. ∞

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12. A signal applied to the negative terminal of an op-amp will be shifted in phase_____ at the output.

a. 0° b. 90° c. 180° d. 270°

13. The closed loop gain of the voltage follower is_____.

a. 1 b. 100 c. 1000 d. ∞

14. The op-amp chip number is

a. 7400 b. 7402 c. 7486 d. 741

15. The 0V at the inverting input terminal of an op-amp is referred to as…..

a. subtractor b. comparator

c. virtual ground d. common ground

II Fill in the blanks:

16. The point of intersection of d.c and a.c load lines is the_____.

17. When no signal is applied to a transistor circuit it is said to be in the _____.

18. A FET has _____input impedance and low noise level.

19. A UJT has _____ PN junction.

20. CMRR is _____for a differential amplifier.

III State whether true or false:

21. When a.c signal is applied, the operating point moves along d.c load line.

22. A transistor is used as an amplifier.

23. The parameters of UJT are drain resistance, transconductance and amplification factor.

24. An ideal OPAMP has an infinite voltage gain.

25. The function of a D/A converter is opposite that of an A/D converter.

IV Answer briefly:

26. What is transistor biasing?

27. What is multistage transistor amplifier?

28. What is pinch off voltage?

29. Define CMRR.

30. What is ADC?

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SECTION – B

ANSWER ANY FIVE QUESTIONS: (5 x 5 = 25)

1. Mention the advantages and disadvantages of base resistor transistor biasing method.
2. Distinguish between FET and bipolar transistor.
3. The intrinsic stand off ratio for a UJT is determined to be 0.6. If the inter-base resistance is 10KΩ. What are the values of R_{B1} and R_{B2}?
4. Find the output voltage for the inverting amplifier circuit. Assume R_{in}= 20 KΩ, R_F= 200 KΩ and V_{in}=1 volt. And draw the circuit by using opamp.
5. Find the output voltage for the inverting summing amplifier circuit.

   Assume R_1= 100 KΩ, R_2= 50 KΩ, R_F= 100 KΩ and V_1=2 volts and V_2=3 volts. And draw the circuit by using opamp.
6. Solve the following simultaneous equations by using Opamp x+y=5, x-y=1.
7. Explain D/A converter using binary weighted resistor method.

SECTION – C

ANSWER ANY THREE QUESTIONS: (3 X 15 = 45)

8. Describe the voltage divider biasing method in detail.
9. With a neat circuit diagram, explain the working of RC coupled transistor amplifier.
10. Explain UJT relaxation oscillator with necessary circuit.
11. Explain how an Opamp can be used as
    (i) an adder
    (ii) an integrator
    (iii) a differentiator.
12. Explain A/D converter by using counter method.

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