B.E. DEGREE EXAMINATIONS: APRIL / MAY 2009

Fourth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U07EE402 Electronic Circuits

Time: Three Hours   Maximum Marks: 100

Answer ALL the Questions:-

PART A (20 x 1 = 20 Marks)

1. A BJT operating in the active region has the magnitude at the reverse bias is increases, the effective base width
    a) Remains unaltered   b) increases
    c) decreases   d) may increase or decrease depending on the nature of transistor material

2. When a BJT is fully switches ON, it is said to be
    a) shorted   b) saturated   c) open   d) cutoff

3. Input resistance of FET common source amplifier in its low frequency small signal operation is
    a) very small   b) medium   c) high   d) almost infinite

4. In class AB amplifier with sinusoidal input signal, output current flow for
    a) full cycle   b) more than half cycle   c) half cycle   d) less than half cycle

5. In a single tuned tapped capacitance coupled amplifier, tapping on the coil is used to
    a) permit use of smaller coil   b) permit use of smaller tuning capacitor
    c) permit maximum transfer of power   d) permit adjustment of 3 dB band width

6. The difference between the two input voltage signals
    a) differential amplifier   b) feed back amplifier
    c) small signal amplifier   d) small and large signal amplifiers

7. If I_{B1} = 85 µA and I_{B2} = 750 µA through the base resistor of differential amplifier. Its input offset and input bias currents are
    a) 600 µA and 500 µA   b) 625 µA and 625.5 µA
    c) 400 µA and 500 µA   d) 665 µA and 471.5 µA

8. The multistage amplifier with tuned circuti which are tuned at different frequencies
    a) stagger tuned amplifier   b) double tuned amplifier
    c) single tuned amplifier   d) synchronously tuned amplifier

9. In negative feedback amplifier use of series mixing causes the input resistance to
    a) decrease   b) increase   c) zero   d) unaltered

10. The common source amplifier using unbypassed resistor in the source lead is a negative feedback amplifier using
    a) current series feedback   b) voltage series feedback
    c) current shunt feedback   d) voltage shunt feedback

11. Crystal oscillator uses

    a) silicon crystal   b) germanium crystal

    c) crystal diode   d) piezo – electric quartz crystal

12. In Hartley Oscillator, $L_1 = 15$ mH, C = 50 pF, M= 5 µH, f =168 KHz. Calculate L_2

    a) 2.9394 mH   b) 3.9394 mH   c) 15.9394 mH   d) 2.9394 H

13. Non sinusoidal waveforms generate

    a) oscillator   b) UJT   c) clamper   d) multivibrator

14. The d.c. inserter circuit is

    a) clamper circuit   b) multivibrator circuit

    c) clipper circuit   d) schmitt trigger circuit

15. Voltage comparator is a

    a) clipper circuit   b) clamper circuit   c) diode circuit   d) schmitt trigger circuit

16. A negative shunt clipper has ± 5V input and it produce ± 4.5 V maximum out put when the load current is 2 mA. Determine suitable input resistance.

    a) 250 Ω   b) 250 KΩ   c) 2.5 Ω   d) 25Ω

17. The basic reason why a full wave rectifier has twice the efficiency of a half wave rectifier is that

    a) it makes use of a transformer

    b) its ripple factor is much less

    c) it utilises both half - cycle of the input

    d) its output frequency is double the line frequency

18. The output of a half – wave rectifier is suitable only for

    a) running car radios   b) running ac motors

    c) charging batteries   d) running tape recorders

19. In a rectifier, large the value of shunt capacitor filter

    a) large the peak to peak value of ripple voltage

    b) large the peak current in rectifying diode

    c) longer the time that current pulse flows through the diode.

    d) smaller the d.c. voltage across the load

20. Which rectifier requires four diodes

    a) Half – wave voltage doubler

    b) Full - wave voltage doubler

    c) Full – wave bridge circuit

    d) Voltage Quadrupler

PART B (5 x 16 = 80 Marks)

21. a) i. Sketch a npn transistor CE amplifier circuit that uses fixed bias. Include a capacitor coupled signal source and load resistor. Explain the circuit operation.

                                                      (10)

    ii.For the FET binary circuit then in Fig 1., determine quiescent point V_{ds}, V_d, V_g, and V_s.

                                                      (6)

+ 16 V

$2\ k\Omega$

D

$I_{DSS} = 10\ mA$

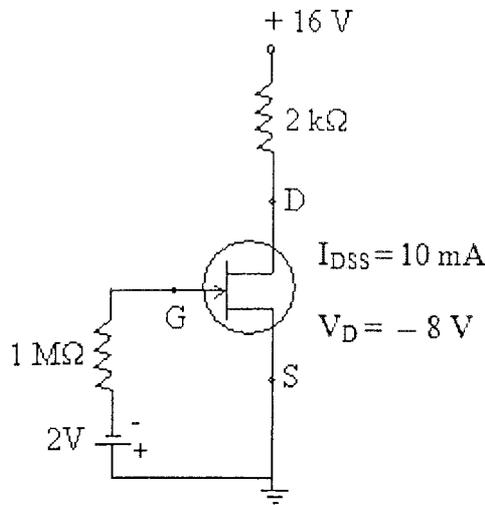$V_D = -8\ V$

G

$1\ M\Omega$

S

2V

Fig 1

(OR)

21. b) With a neat sketch explain the working of push pull class B amplifier and derive the equation for efficiency. How cross over distortion can be rectified? (16)

22. a) Draw the circuit diagram of a differential amplifier. Explain the operation in difference mode and common mode. (16)

(OR)

22. b) With a neat diagram explain the characteristics of signal tuning amplifier. Also explain the expressions for Gain. What are the advantages? (16)

23. a) Discuss in detail the characteristics of negative feed back amplifier. (16)

(OR)

23. b) Draw and explain the Hartley oscillator circuit and mention the Crystal oscillator applications. (16)

24. a) Calculate the component values of mono stable multi vibrator and developing an output pulse of 500μs, duration. Assume the h_{fe} (min), $I_{ce} = 5ma$, $V_{cc} = 10v$, and $V_{bb} = -4v$ (16)

(OR)

24. b) Explain the various types of clipper and clamper circuit with its examples. (16)

25. a) Describe the working principles of full wave rectifier with LC filter and derive its ripple factor. (16)

(OR)

25. b) Give a short note on (i) Series voltage regulator (ii) . SMPS (8+8)

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