B.E & B.TECH. DEGREE EXAMINATIONS: OCTOBER / NOVEMBER-2008

Second Semester

U07PH206: PHYSICS-II

(Common for Computer Science Engineering & Information Technology)

Time: Three Hours   Maximum marks: 100

PART A (20 x 1 = 20 Marks)
Answer ALL Questions:-

1. The equivalent resistance of the resistors 20Ω and 30Ω connected in parallel is

   a) 12 Ω   b) 6 Ω   c) 50 Ω   d) 10 Ω

2. There is a voltage drop of 100 volts across a resistance of 100 Ω. How much Power will be consumed

   a) 1000W   b) 100W   c) 10W   d) 0.1W

3. The property of opposition to change in current is

   a) Resistance   b) conductance   c) Inductance   d) capacitance

4. How many modes are there in fig: 1?
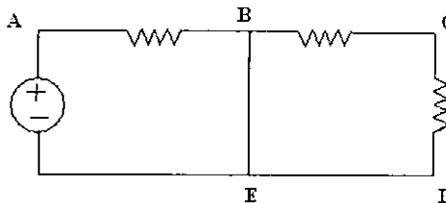   a) 6   b) 5   c) 3   d) 4

Fig: 1

5. Maximum power is transferred from source to load when the load resistance R_S is equal to the source resistance R_L is
   a) equal to the source resistance R_L
   b) zero
   c) greater than R_L
   d) lesser than R_L

6. Thevenin's theorem states that a circuit with two terminals can be replaced by an equivalent circuit consisting of a voltage source
   a) in parallel with a resistance
   b) in serious with a resistance
   c) in parallel with a current source
   d) in serious with a current source
   e)

7. The relation between the line voltage and phase voltage in star connection is

   a) $V_L = \sqrt{3}\, V_{PH}$ b) $V_L = V_{PH}$ c) $V_L = \sqrt{2} V_{PH}$ d) $V_L = 2\, V_{PH}$

8. When two impedances are connected in parallel, their equivalent impedance is given by

a)Z_1Z_2 b)Z_1+Z_2 c) $(Z_1-Z_2)/(Z_1+Z_2)$ d)$Z_1Z_2/(Z_1+Z_2)$

9. Which statement is incorrect?
   a) A zener diode is a heavily doped p-n junction diode
   b) A zener diode has sharp breakdown voltage
   c) A zener diode is always forward biased
   d) In the breakdown region, the voltage across zener diode is constant

10. Law of mass action is given by
    a)$n_i=np$ b)$n_i^2=np/n_o$ c)$n_i^2=np$ d)$n_on_i=np$

11. When a p-n junction is reverse biased, the barrier potential

    a) becomes zero b) remains constant c) is increased d) is decreased

12. Mass of the hole is
    a) infinite   b) zero   c) = electron mass   d) = Proton mass

13. An inductor in a filter circuit allows -----------------

    a) direct current but blocks alternating current
    b) alternating current but blocks direct current
    c) both direct and alternating currents
    d) neither direct current nor alternating current

14. The current that flows in the collector in the absence of the input signal is

    a) zero signal collector current
    b) saturation collector current
    c) A.C. collector current
    d) cut off collector current

15. A waveshaping network which has no stable state is

    a) a schmitt trigger
    b) an astable multivibrator
    c) a monostable multivibrator
    d) a pulse position modulator

16. What is β of a transistor when α is 0.98
    a) 98   b) 0.98   c) 0.49   d) 49

17. In a binary ladder network of a DAC, the value of the smaller resistance is
    5KΩ, what is the resistance value of the other resistance?

    a) 5KΩ   b) 10KΩ   c) 0.5KΩ   d) 50KΩ

18. A selective network which passes all the frequencies higher than cut off
    Frequencies and attenuates all other frequencies is called as

    a) a low pass filter   b) a high pass filter
    c) a band pass filter   d) a band stop filter

19. The gain of an ideal OPAMP is
    a) unity   b) zero   c) 100   d) infinite

20. Which one of the following is called as a voltage follower?
    a) inverting amplifier   b) scale changer
    c) non inverting amplifier   d) summing amplifier

PART B (5 x 16 = 80 Marks)

21.a) i) State Kirchhoff's current law and voltage law with suitable figures.   (3+3)

    ii) Obtain all the currents and voltages in fig: 2   (10)

Fig: 2

(OR)

b) i) Explain voltage division rule and current division rule.   (4+4)

    ii) In fig: 3, use current and voltage division to obtain an expression for V_5 (8)

Fig: 3

22. a) State Norton's theorem and find the Thevenin and Norton equivalent
    circuits for the network to the left of the terminals A – B of fig: 4   (4+12)

Fig: 4

(OR)

b) Describe in detail three phase Y-Y connection and three phase Δ connection   (8+8)

23. a) Explain in detail the working principles and characteristics of MOSFET in
    depletion mode and enhancement mode

(OR)

b)i) How is the solids classified based on band theory? (6)
   ii)What is a Zener diode? Explain its V-I characteristics and application as
     voltage regulator with suitable circuit diagram. (2+8)

24. a) With necessary diagrams, describe the following circuits
    i) Full wave bridge rectifier (8)
    ii) Common base transistor circuit (8)

(OR)

b) Draw neat circuit diagrams of RC phase shift oscillator and Hartley
   oscillator and show how oscillations are sustained in these circuits. (8+8)

25. a) Discuss the following applications of OPAMP
    i) Integrator
    ii) Relaxation oscillator (8+8)

(OR)

b) Show how operational amplifier can be employed as subtractor and R-2R
   Ladder digital to analog converter. (8+8)