

**DIPLOMA IN ELECTRONICS AND
COMMUNICATION ENGINEERING (DECVI)/
ADVANCED LEVEL CERTIFICATE COURSE IN
ELECTRONICS AND COMMUNICATION
ENGINEERING (ACECVI)**

Term-End Examination 00901
December, 2012

BIEL-028 : CIRCUITS AND NETWORKS

Time : 2 hours

Maximum Marks : 70

Note : *First question is compulsory and Attempt any 4 questions from 2 to 8, each question carry equal marks.*

1. (a) Laplace transform of $e^{-at} \sin \omega t$ is : **7x2=14**

(i)
$$\frac{\omega}{(s + a)^2 + \omega^2}$$

(ii)
$$\frac{\omega}{(s - a)^2 + \omega^2}$$

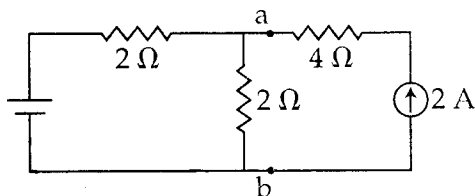
(iii)
$$\frac{\omega}{(s - a)^2 - \omega^2}$$

(iv)
$$\frac{\omega}{(s + a)^2 - \omega^2}$$

- (b) The final value of $\frac{2s}{s^2 + 8s^3 + 16s^2 + s}$ is :
- (i) infinity (ii) 2
 (iii) zero (iv) 1
- (c) When a number of 2-port networks are connected in cascade, the individual :
- (i) Z-matrices are added
 (ii) Y-matrices are added
 (iii) Chain matrices are multiplied
 (iv) h-matrices are multiplied
- (d) With the usual condition, a two-port resistive network - satisfies the condition

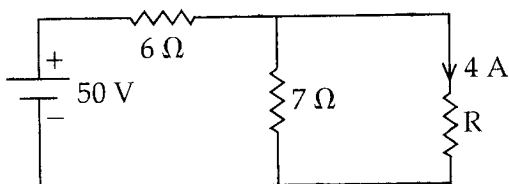
$A = D = \frac{3}{2} B = \frac{4}{3} C$. The Z_{11} of the network is :

- (i) $\frac{5}{3}$ (ii) $\frac{4}{3}$
 (iii) $\frac{2}{3}$ (iv) $\frac{1}{3}$
- (e) The voltage across the terminal 'a' and 'b' in the figure is :



- (i) 2.5 V (ii) 3.0 V
 (iii) 3.5 V (iv) 4.0 V

- (f) The value of Resistance R shown in figure :

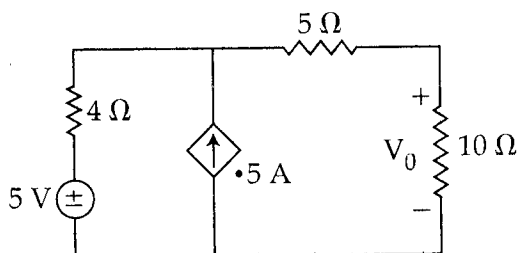


- (i) 3.5Ω (ii) 2.5Ω
 (iii) 1Ω (iv) 4.5Ω
- (g) The first and last critical frequency of an R-C driving point impedance function must respectively be :

- (i) a zero and a pole
 (ii) a zero and a zero
 (iii) a pole and a zero
 (iv) a pole and a pole

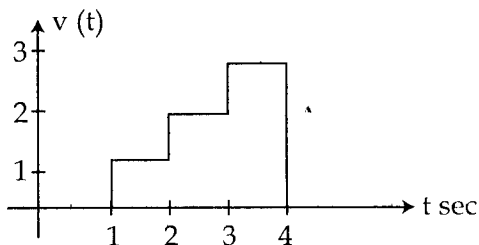
2. (a) Find the Power loss in 10Ω of circuit show in figure :

$2 \times 7 = 14$

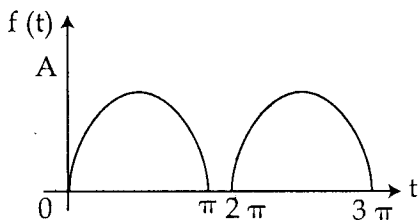


- (b) Explain super position theorem.

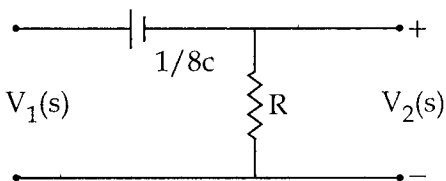
3. (a) Consider the voltage wave form shown in figure the equation of $v(t)$ in terms of step function is : $2 \times 7 = 14$



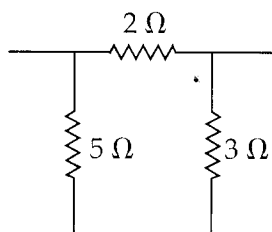
- (b) Explain the properties of Laplace transform.
4. (a) Determine the Laplace transform at the periodic rectified half sine wave as shown in figure : $2 \times 7 = 14$



- (b) Find the amplitude and phase response for the voltage ratio V_2/V_1 of the network are shown in fig :



5. (a) Explain short circuit admittance parameter for two port network. **2x7=14**
- (b) Find the Z parameters for the circuit as shown in fig.



6. (a) Explain the properties of Positive Real Function. **2x7=14**
- (b) Define and explain classification of four terminal network.
7. (a) Explain the properties of the open-circuit and short circuit parameters. **2x7=14**
- (b) What is characteristic impedance ? Explain with help of diagram of any symmetrical network.
8. Write short note of *any two* : **2x7=14**
- (a) T-Type Attenuator
 - (b) Constant K-Type low pass filter
 - (c) Series Resonance Circuit
 - (d) Thevenin Theorem
