Department of Electrical Engineering
University of Engineering & Technology
Peshawar, Mardan Campus

Univ. Reg. No.: MDELE

Circuits Analysis - II (EE-201) – Mid Term Examination
Summer (2017)

Time Allowed: 2hrs **Max Marks: 50**

DIRECTIONS:

1. *Be clear and precise in your answers. Do NOT include unnecessary details.*
2. *No sharing of calculators or any helping material is allowed during exam.*
3. *Don't forget to mention your registration number.*

Q: No. 1:

i) How do we find positive sequence and negative sequence currents using derivative method? (2)
ii) What will be the phase angle between two phases for a 12 phase system? (2)
iii) Why ground/neutral are not used in transmission lines? (2)
iv) Why stepped up voltages and stepped down currents are preferred in long distance transmission lines? (2)
v) What will be the end point voltage in an 11KV line if the line extends to 10km and 10V/KM are the line drops? (2)

Q: No. 2: A star configured load is connected through a 3 phase transmission line with a **230V$_{rms}$** delta connected positive sequenced source configuration having **θ_{ab} = 0°**? Considering per phase impedance of **Z_L= 1+j5 Ω** on load side and line impedance of **0 Ω**.

i) Draw the source to load 3 phase connection diagram. (1)
ii) Determine the phase voltages, currents and per phase total power **(S)** for the connected load. (4)
iii) Also find the total delivered power (S) by the system. (5)

Q: No. 3: For the circuit in **Fig. 1**;

i) Find the voltage gain (**A_v(s))** in terms of complex frequency **s=jω.** (5)
ii) What type of Filter can be designed by such combination of capacitors? (5)

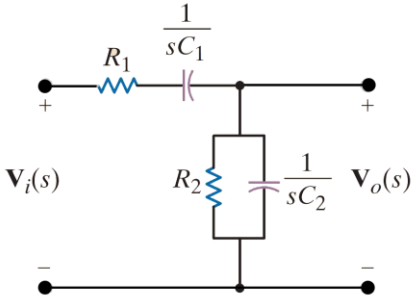

Fig. 1

Hint: Voltage and current dividend rules can find the ratios

Q: No. 4:

The half power bandwidth of a series RLC circuit is **10kHz**. If the circuit is to be designed from an inductive component of 0.2mH and a capacitive component of 1µF;

i) What will be the central tuning frequency (f_c) of the circuit? (4)
ii) What will be the lower bound (f_L) and upper bound (f_H) of the Bandwidth? (4)
iii) Determine the quality factor of the filter for **R=20Ω, 30Ω and 100Ω**. (6)

Q: No. 5: For the designed circuit in **Q: No. 4**;

i) Is the designed circuit useful in filtering out a voltage signal of **8-10kHz** from a noise band of **20Hz-20kHz**? (2)
ii) Draw the frequency vs gain plot for the designed filter. (4)

THE END