Electrical Engineering Department
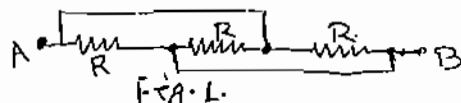## TTL771 Electronics and Controls for Textile Industry
Major Test

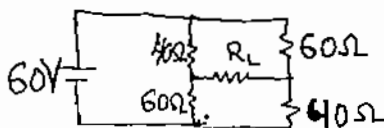Time allowed- 2 hour   Maximum Marks- 35

Answer all questions

Q.1 (a) Compute the equivalent resistance between A and B of the circuit of Fig.1.   (2)


Fig. 1.

(b) Use Thevenin's theorem to replace the three-loop equivalent circuit of Fig.2 by a single loop in which the identity of R_L is preserved.   (3)

Fig. 2.

Q.2: A periodic voltage V_1 of Fig.3 is applied to the input of the circuit presented in Fig.4. Show the input signal and the output signal in the same graph.   (5)

Fig. 3.   Fig. 4.
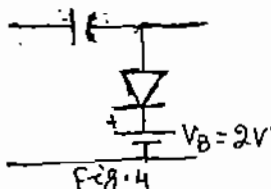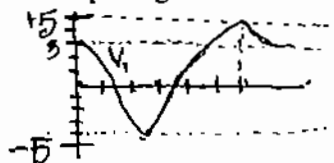
Q.3 The signal of Fig. 5 is applied to the circuit shown. Predict the reading of the meter if it is a dc ammeter.   (5)

Fig. 5.
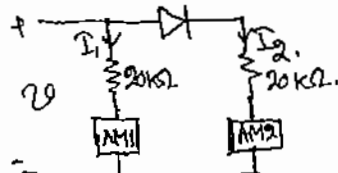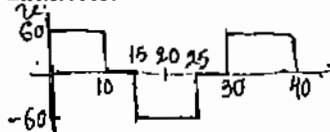
Q.4. For the circuit of Fig.6 find the voltage V_L and V_1. Assume R_L to be very high.   (5)

Fig. 6

Q.5. Draw the circuit for a low pass and a high pass filter using OPAMP. What is cutoff frequency and how it is calculated.   (5)

Q.6. A 250 V, 50 hp, 1000 rpm d.c. shunt motor drives a load that requires a constant torque regardless of the speed of operation. The armature circuit resistance is 0.04 . When this motor delivers rated power, the armature current is 160 A.
(a) If the flux is reduced to 70% of its original value, find the new value of armature current.
(b) What is the new speed.   (2.5+2.5)

Q.7. A separately excited dc motor has the following nameplate data: 100 hp, 440 V, 2000 rpm.
(a) Determine the rated torque
(b) Determine the current at rated output if the efficiency of the motor is 90% at rated output.   (2.5+2.5)