

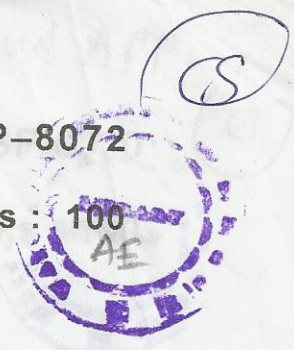
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Con. 5644-09.

SP-8072

(3 Hours)

[Total Marks : 100]



- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions from the remaining **six** questions.
 (3) **Figures** to the **right** indicate **full** marks.
 (4) Assume **suitable** data wherever **necessary**.
 (5) Draw neat labelled **diagrams** wherever **necessary**.

1. Describe the human gait cycle using suitable diagrams and explain the importance of various stages. 20
2. (a) Explain using suitable block diagram working of a heart-lung machine. 10
 (b) Explain any two types of oxygenators using suitable diagrams. 10
3. (a) Explain the principle of three point pressure in designing of a device. 10
 (b) Explain patient rehabilitation concept and how it helps the patients who are physically challenged. 10
4. (a) Explain use of splints in upper limbs. 10
 (b) Explain the fabrication procedure of a PTB socket. 10
5. Explain the principle of total contact socket with respect to a AK quadrilateral socket. 20
6. (a) Classify the spinal orthosis and describe any one in detail with neat diagrams. 8
 (b) Explain the different kinds of levers existing in the human body and give one example for each type. 12
7. Write short notes on any **four** :- 20
 - (a) Hollow fiber dialyser
 - (b) Artificial heart valves
 - (c) SACH foot
 - (d) Milwaukee Brace
 - (e) Block diagram of AKD
 - (f) Standard stress strain curve
 - (g) AE orthosis.

4. (a) Design a low pass, second order RRC filter using equal component design using $f_c = 1\text{KHz}$ and $Q = 5$. What is its dc gain? 10
 (b) Draw functional diagram of PLL 565 and explain its working. 10
5. (a) Draw circuit diagram for inverting Schmitt Trigger. Explain working and write an equation for V_{LTP} and V_{UTP} . 10
 (b) Design phase shift oscillator with $f_o = 4\text{KHz}$. 10

Answer any two of the following