

the amplifier is positive going pulse then D_3 will be ON. In C_3 charging up to peak value. R_3 & C_3 combination is used to set some time constant value.

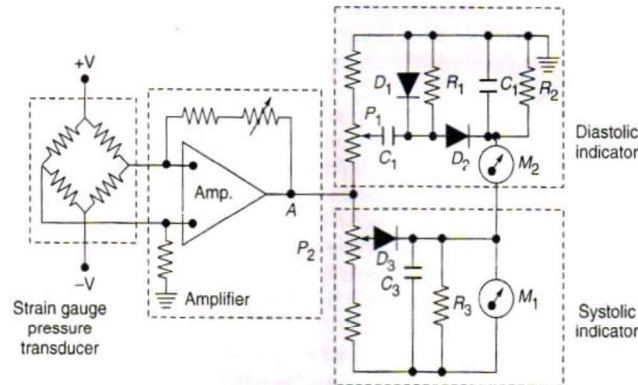


Fig 2.11.2(b) Circuit diagram for measurement of systolic and diastolic blood pressure

Which is used to stable display. Clamping circuit is available C_1 & D_1 used to develop voltage is equal to peak to peak value of the pressure pulse. This Voltage appeared across R_1 resistance. D_2 diode is ON so C_2 charged up to the peak value. Diastolic pressure is displayed using the indicator M_2

$$M_2 \text{ reading} = \text{peak systolic value} - \text{peak to peak pressure value.}$$

TWO MARKS

1) What are the typical values of blood pressure and pulse rate of an adult?

Systolic (maximum) blood pressure in the normal adult is in the range of 95 to 145 mm Hg, with 120 mm Hg being average. Diastolic (lowest pressure between beats) blood pressure ranges from 60 to 90 mm Hg, 80 mm Hg being average.

2) What are systolic and diastolic pressures?

The heart's pumping cycle is divided into two major parts systole and diastole. Systole is defined as the period of contraction of the heart muscles specifically the ventricular muscle at which time blood is pumped into the pulmonary artery and the aorta. Systolic pressure is 120 mm Hg (average value). Diastole is the period of dilation of the heart cavities as they fill with blood. Diastolic pressure is 80 mm Hg (average value).

3) What is the reason for decrease of cardiac output?

The reason for decrease of cardiac output may be due to low blood pressure, reduced tissue oxygenation, poor renal function, shock and acidosis.

4) Define – Cardiac Output

Cardiac output is defined as the amount of blood delivered by the heart to the aorta per minute. In case of adults during each beat, the amount of blood pumped ranges from 70 to 100 ml. for normal adults the cardiac output is about 4- 6 liters/ minute.

5) State the principle behind the indicator dilution method.

The indicator dilution method is based on the principle that a known amount of dye or radio isotope as an indicator is introduced with respect to time at the measurement site, so the volume flow of blood can be estimated.

6) What is residual volume?

Residual volume is the volume of gas remaining in the lungs at the end of maximum expiration.

7) Define – Tidal Volume

Tidal volume is also called as normal depth volume of breathing or is the volume of gas inspired or expired during each normal quiet respiration cycle.

8) What is total lung capacity?

The total lung capacity is the amount of gas contained in the lungs at the end of maximal inspiration.

9) Define – Vital Capacity

The vital capacity (VC) is the maximum volume of gas that can be expelled from the lungs after a maximal inspiration.

10) What is electrophoresis?

Electrophoresis is a method for separating and analyzing macromolecular substances such as plasma proteins. The method is based on the fact that, the molecules carry electric charges and therefore migrate in a electric field.

11) How is cardiac output is used?

Using implanted electromagnetic fine probe on the aorta, find the cardiac output per minute directly can be found by multiplying the stroke volume with the heart beat rate per minute.

12) What are the uses of gas analyzers?

Gas analyzers are used to determine the quantitative composition of inspired and expired gas to assess the lung function.

13) What are the uses of blood flow meters?

Blood flow meters are used to monitor the blood flow in various blood vessels and to measure cardiac output.

14) What are the applications of flame photometer?

Flame photometer is used to analyze urine or blood in order to determine the concentration of potassium (K), sodium (Na), calcium (Ca) and lithium (Li).

15) What are blood cells?

The blood cells have important functions in our body. The red blood cell is used for the transport of oxygen and carbon dioxide. The white blood cells are part of the body's defense against infections and foreign substances. The platelet is involved in the clotting of blood.

16) What is the purpose PO2 electrode is used?

PO2 electrode is used to determine the oxygen tension in the blood. It is a piece of platinum wire embedded in an insulating glass holder with the end of wire exposed to the electrolyte into which the oxygen from the solution under measurement is allowed to diffuse through the membrane.

17) How is auto analyzer useful in medical field?

Auto analyzer is used to measure blood chemistry and display that on a graphic recorder.

18) What are korotkoff sounds?

In the Blood pressure (BP) measurement, when the systolic pressure exceeds the cuff pressure, then the doctor can hear some crashing, snapping sounds through the stethoscope. These sounds are called as korotkoff sounds.

19) What is cardiac output? What are the methods of measurement of cardiac output?

Cardiac output is the amount of blood delivered by the heart to the aorta per minute. For normal adult, the cardiac output is 4- 6 litres/min. The cardiac output is measured by using three methods. They are Fick's Method, Indicator dilution method, Measurement of cardiac output by impedance change.

20) What are the two methods of pulse measurement?

The methods used for measuring pulse are transmittance and reflectance methods.

16 MARKS

1. Explain in detail about chemical electrode.(12)
2. Explain the working principle of autoanalyser (8)
3. Explain the working principle of blood flow meter. (16)
4. Define the term residual volume, tital volume, vital capacity and total lung capacity(6)
5. Discuss the various methods for determining cardiac output. (16)
6. Explain about Respiratory measurement Technique. (16)
7. Explain about blood pressure measurement. (10)
8. Discuss in detail about temperature measurements.(6)
9. Describe the operation of the blood cell counter. (16)
10. Explain the following(16)
 - a.colorimeter, b.flame photometer, c.spectrophotometer, d.Filter flurometer
 - e.Chromatography