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## Steroids and Hormones

1. Gestogenic Hormone  $\rightarrow$  Progesterone.

Ans:  $\rightarrow$  Progesterone:  $\rightarrow$  It is one of the most important members of gestones.

### Constitution

i] Molecular formula of progesterone is  $C_{22}H_{30}O_2$ .

ii] presence of two ketonic group:  $\rightarrow$  It forms dioxime with hydroxylamine.

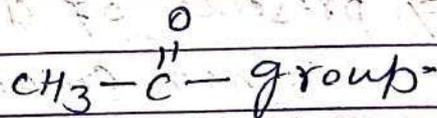
iii] presence of a double bond:  $\rightarrow$  When catalytically reduced, it takes up three molecules of hydrogen forming diol showing the presence of one double bond because two hydrogen molecules are utilised in the formation of two  $-CHOH$  groups. Thus the parent hydrocarbon of progesterone is  $C_{21}H_{36}$  which corresponds to the general formula  $(C_{21}H_{36}-6)$  for tetracyclic compounds.

iv] presence of steroid nucleus:  $\rightarrow$  X-ray analysis shows the presence of steroid nucleus

which is further confirmed by its synthesis from cholesterol and stigmasterol.

v7 presence of an  $\alpha, \beta$ -unsaturated ketonic group:  $\rightarrow$  The progesterone is very sensitive to alkali indicating the presence of  $\alpha, \beta$ -unsaturated ketonic group.

v17 presence of  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}$ -group:  $\rightarrow$  When progesterone is heated with any halogen and NaOH, it gives haloform i.e. it undergoes haloform reaction. This reaction indicates that progesterone contains:



On the basis of above discussion, the structure of progesterone is written as:-

