

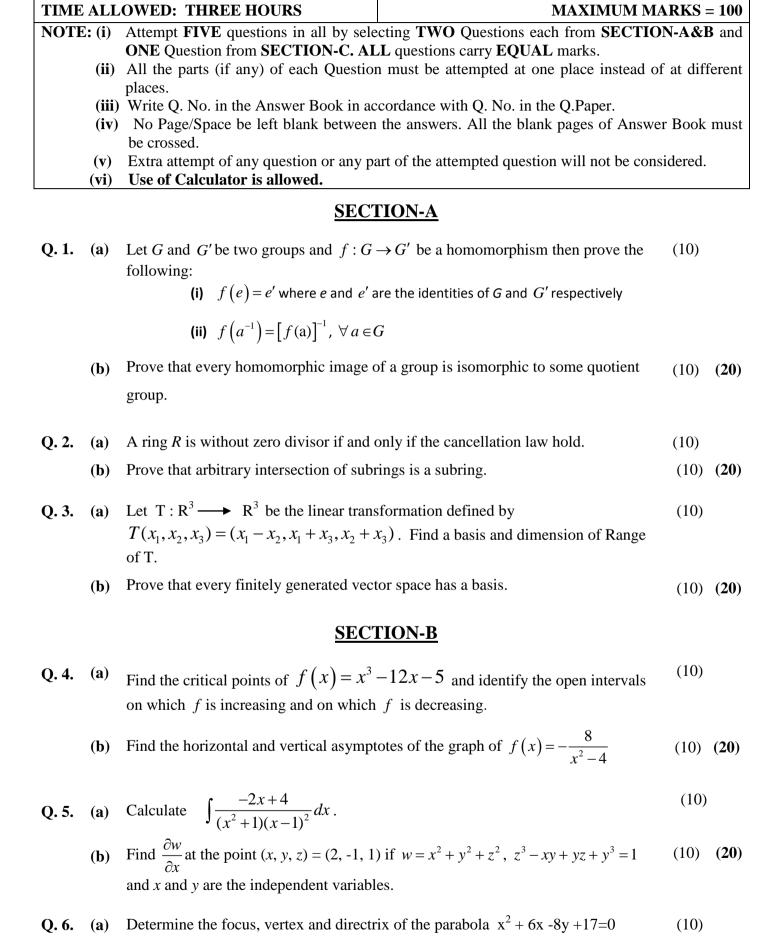
(b)

 $(3\sqrt{2},-3\sqrt{2})$

FEDERAL PUBLIC SERVICE COMMISSION COMPETITIVE EXAMINATION-2020 FOR RECRUITMENT TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT

Roll Number

PURE MATHEMATICS



Find polar coordinates of the point p whose rectangular coordinates are

(10) (20)

PURE MATHEMATICS

SECTION-C

- Q. 7. (a) Show that $(\cos \theta + i \sin \theta)^n = \cos(n \theta) + i \sin(n \theta)$ for all integers n. (10)
 - (b) Find the n, nth roots of unity. (10) (20)
- Q. 8. (a) Find the Taylor series generated by $f(x) = \frac{1}{x}$ at a = 2. Where, if anywhere, does the series converge to $\frac{1}{x}$?
 - **(b)** Show that the p-series $\sum_{n=1}^{\infty} \frac{1}{n^p}$, (*p* a real constant) converges if p > 1, and diverges if P < 1
