

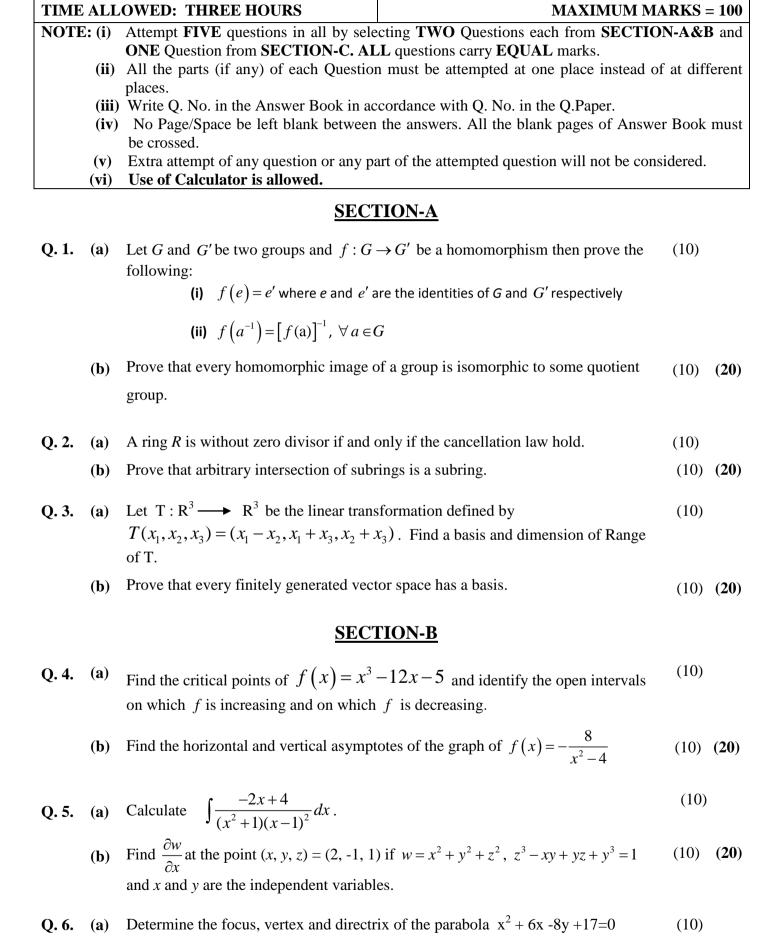
**(b)** 

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

## 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

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