



**Exam Rules:**

1) Students will send their each signed answer papers (preferable in PDF format, otherwise as an image file) to own group lecturer via their e-mails **with the extension std.yildiz.edu.tr** **within 15 minutes after the end of the exam duration**. Emails that are not sent within the specified time or sent from addresses that do not have std.yildiz.edu.tr extension will not be considered.

2) Students will write "group number, student number, name and surname" respectively, on the subject tab of the e-mail they send.

3) The following informations must exist in the exam paper: Name and Surname, Course group number, Student number, Signature (signed **by a pen with blue ink**)

**QUESTIONS**

1.) For which values of  $x \in \mathbb{R}$ , does the power series  $\sum_{n=1}^{\infty} \frac{(x-4)^n}{2^n \cdot \sqrt[5]{n^3+7}}$  converge absolutely,

converge conditionally and diverge? **(40P)**

2.)  $\sum_{n=1}^{\infty} \left( \frac{2}{3^{n+1}} + \frac{(-1)^n}{5^n} \right) = ?$  **(25P)**

3.) **a)** Write the definite polar integral(s) which gives the area of the region that lies **inside** the cardioid  $r = 1 - \cos \theta$  and **outside** the circle  $r = \cos \theta$ .

(Sketch the graph) (DO NOT evaluate the definite integral(s) )

**b)** Write the definite polar integral(s) which gives the area of the region that lies **outside** the cardioid  $r = 1 - \cos \theta$  and **inside** the circle  $r = \cos \theta$ .

(Sketch the graph) (DO NOT evaluate the definite integral(s) )