1 a.

b.

2 a.

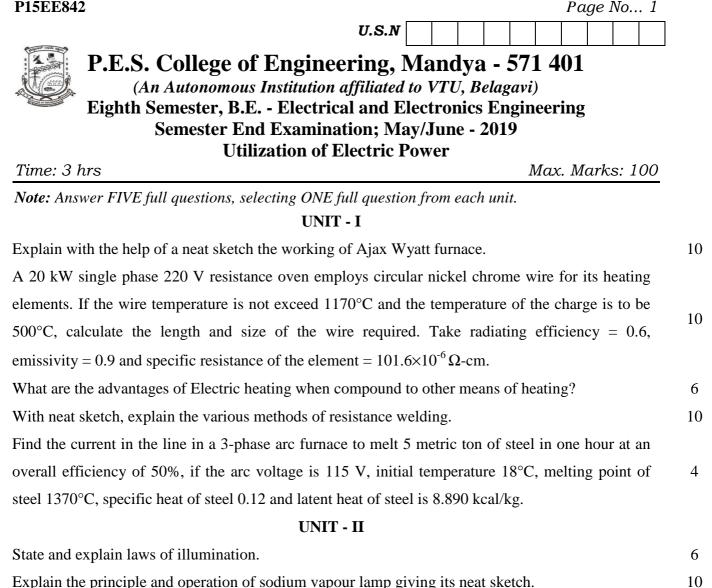
b.

с.

3 a.

b.

5 a.



- What are the different lighting schemes? Explain them briefly. c.
- 4 a. What are the factors to be considered in factor lighting design?
  - Give the list of flood schemes and discuss. b.

Explain the following:

Two lamps of 250 candle powers and 400 candle powers are on two lamp posts 100 m apart. The c. posts have different heights of 15 m and 30 m. Calculate the illumination mid-way between the 8 lamp posts.

## **UNIT - III**

0		
	i) Direct steam engine system	10
	ii) Direct internal combustion engine system of traction with merits and demerits.	
b.	Explain the different systems of Traction and mention its advantages and disadvantages.	10
6 a.	What is meant by composite system of track electrification? Briefly explain.	7
b.	Explain the necessary qualities of an ideal traction system.	8
c.	Explain the Battery-Electric drive system of traction with merits and demerits.	5

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UNIT - IV				
7 a.	Draw and explain typical time curve for an electric train movement.	7		
b.	Derive the expression for maximum speed assuming Trapezoidal speed time curve.	8		
c.	Write a note on coefficient of adhesion.	5		
8 a.	Define the following :			
	i) Crest speed	4		
	ii) Schedule speed			
b.	Derive the expression for Tractive effort.	8		
c.	A train has a scheduled speed of 65 km/hr between the stops which are 6 km apart. Determine the			
	maximum speed over the run, if the duration of the stop is of 30 s. The values of acceleration and	0		
	retardation are 2 km/hr/s and 3 km/hr/s respectively. Assume simplified trapezoidal speed	8		
	time curve.			
UNIT - V				
9 a.	Explain how energy saving is achieved by series parallel control?	10		

b.	Give the explanation regarding AC series motor with its vector diagram.	10
10 a.	Give the constructional features and its speed thrust graph for a Linear Induction Motor.	10
b.	Explain the following :	
	i) Plugging	10

ii) Rheostatic braking

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