

<b>Name:</b>	 <b>UPES</b> UNIVERSITY WITH A PURPOSE
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**Online End Semester Examination, Dec 2020**

<b>Course: Utilization &amp; Industrial electronics</b>	<b>Semester: VII</b>
<b>Program: B. Tech. Electrical</b>	<b>Time 03 hrs.</b>
<b>Course Code: EPEG 4002</b>	<b>Max. Marks: 100</b>

**SECTION A**

- 1. Each Question will carry 5 Marks**
- 2. Instruction: Complete the statement / Select the correct answer(s)**

S. No.	Question	CO
Q 1	he voltage - current characteristics of the arc welding must be a. Exponentially rising b. Drooping c. Straight line d. Parabolic	CO4
Q2	_____ are the advantages of high frequency heating.	CO4
Q3	The magnitude for the tractive effort which is required for the propulsion of the train depends on a. The adhesive weight b. Friction between the driving wheel and the track c. Both (a) and (b) d. Neither (a) nor (b)	CO3
Q4	In a diesel electric traction, if the current in the traction motor increases then the generator field a. Demagnetizes and voltage decreases b. Magnetizes and voltage increases c. Magnetizes and voltage decreases d. Demagnetizes and voltage increases	CO2
Q5	DC _____ motor is suitable for electrical traction application, and also where _____ is required.	CO1
Q6	_____ are the requirement of good heating element.	CO1

**SECTION B**

- 1. Each question will carry 10 marks**
- 2. Instruction: Write short / brief notes**

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Q 7	A piece of insulating material is to be heated by dielectric heating. The size of the piece is 100 sq cm. area and 2.5 cm thick. A frequency of 25 MHz is used and the power absorbed is 350 W. Calculate the voltage necessary for heating and current that flows in the material. The material has relative permittivity of 5 and P.F. of .05.	CO4
Q 8	Explain the Arc stability in relation with electric welding?	CO1
Q 9	Large area 50m. square is illuminated by 4 lamps fixed at the corners each of 1200 C.P. Calculate illumination at the base of each lamp and at the center of the square.	CO5
Q 10	Illustrate the principle of dielectric heating and obtain the principle of dielectric power loss.	CO4
Q 11	Derive the cosine law of illumination and cubic cosine law of illumination.	CO5
<b>Section C</b>		
<p><b>1. Each Question carries 20 Marks.</b>  <b>2. Instruction: Write long answer.</b></p>		
Q12	<p>An electric train weighing 300 tonnes runs 10% up gradient with following time curve:</p> <ul style="list-style-type: none"> <li>(i) Uniform acceleration of 1.5 kmphs for 30 seconds</li> <li>(ii) Constant speed for 40 seconds.</li> <li>(iii) Coasting for 30 seconds.</li> <li>(iv) Braking at 2.5 kmphs to rest.</li> </ul> <p>Calculate the specific energy consumption if tractive resistance is 45 N/tonne, overall efficiency of transmission and motor 75%.</p> <p>Also write a python program for the given example.</p> <p style="text-align: center;">OR</p> <p>Compare DC and AC system of railway electrification from the point of main line and sub urban main line railway service. Also discuss the third rail concept for railway electrification and its limitation in context of Indian scenario.</p>	CO3