

Roll No: -----



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech ASE
Subject (Course): Aircraft Materials
Course Code: ASEG 336
No. of pages: 2

Semester – V
Max. Marks : 100
Duration : 3 Hrs

Instructions:

- 1. The Question paper has three sections: Section A, B and C.**
- 2. Section B and C have internal choices.**

Section A (Attempt ALL questions)			
1.	Classify aluminum alloys.	[5]	CO3
2.	Describe the importance of high-temperature nickel alloys in flight structures.	[5]	CO3
3.	Identify the commonly used fibers for polymer and metal matrix composites.	[5]	CO1
4.	Define consumable and non-consumable electrodes for arc welding.	[5]	CO1
Section B (Attempt ALL questions)			
5.	Describe pultrusion process for the production of fiber reinforced plastic (FRP) composites.	[10]	CO4
6.	Describe the selection criteria of aircraft materials based on the engineering considerations.	[10]	CO1
7.	Explain general methods of fabrication of aircraft and aero engine parts.	[10]	CO4

8.	<p>Explain the heat treatment process of 1025-mild-carbon steel and its effect on material properties.</p> <p style="text-align: center;">OR</p> <p>Explain the Intergranular corrosion and its effect on steel alloys.</p>	[10]	CO4
Section C (Attempt ALL questions)			
9.	<p>Categorize resistance welding for alloys and describe resistance spot welding and resistance seam welding in detail.</p>	[20]	CO3
10.	<p>Explain Inconel, Monal and K–Monal alloys, their properties and applications to aerospace vehicles.</p> <p style="text-align: center;">OR</p> <p>Classify titanium and its alloys. Explain, extraction, melting, welding and properties of titanium alloys.</p>	[20]	CO2

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Section A (Attempt ALL questions)			
1.	Identify the alloys useful for propeller blades, propeller hubs and cowl ring.	[5]	CO3
2.	Define carbon fiber reinforced composites with examples.	[5]	CO1
3.	Identify the potential applications of titanium alloys.	[5]	CO3
4.	Describe the selection criteria of aircraft materials based on economic points.	[5]	CO1
Section B (Attempt ALL questions)			
5.	Explain rivets, jigs and fixtures for aircrafts with examples.	[10]	CO4
6.	Explain electrochemical grinding (ECG) and laser-beam machining.	[10]	CO4
7.	Describe plasma arc welding, its advantages and disadvantages.	[10]	CO3

8.	<p>Differentiate Inconel and K–Monal alloys in terms of their properties and applications to aerospace vehicles.</p> <p style="text-align: center;">OR</p> <p>Explain the titanium alloys and their basic principle of heat treatment.</p>	[10]	CO2
Section C (Attempt ALL questions)			
9.	<p>Explain alloy steels and the effect of alloying elements on the properties of these alloys.</p>	[20]	CO1
10.	<p>Describe, why pitting corrosion of aluminum alloys is a serious problem and also explain heat treatment methods of these alloys.</p> <p style="text-align: center;">OR</p> <p>Describe magnesium alloys, their properties, applications to aerospace vehicles, causes of corrosion and corrosion control methods.</p>	[20]	CO2