UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2018

Course: Advance Manufacturing Process **Semester: VI**
Program: B.Tech PIE & ADE
Course Code: ADEG 371 **Max. Marks: 100**
Time: 03 hrs.
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	State the working principal of explosive forming.	4	CO4
Q 2	State the two unique application of LBM, along with advantage and limitation.	4	CO4
Q 3	Differentiate between electrolytes used in STEM and ECM.	4	CO2
Q 4	Draw the schematic arrangement of EBM.	4	CO4
Q 5	Differentiate between ECG, ESD and conventional grinding.	4	CO3
	SECTION B		
Q 6	A wire EDM operation is to be performed on a slab of 18.75mm thick Aluminum using a brass wire electrode diameter 0.125mm. It is anticipated that overcut will be 0.025 mm. using the current of 7A, what is the expected feed rate that can be used in operations. The melting point of Aluminum is 660^0 C.	10	CO3
Q 7	Calculate the material removal rate in Anodic dissolution process of Chromium if the current density is 250(amp/cm^3). Assume atomic weight of chromium is 52 grams, vacancy of Cr at which the solute is 2 and density of Cr is 7.2gm/cc.	10	CO2
Q 8	Explain the working of PAM with a neat sketch and process parameters.	10	CO4
Q 9	Explain in brief the word "Unconventional" in unconventional machining process and explain its various applications. OR Give a comparison of unconventional processes in terms of process, metal removal rate, and application.	10	CO1
	SECTION-C		

Q 10	Find out the approximate time required to machine a hole of diameter =6mm in a WC plate (flow strength of work material = 6.9×10^9 N/m2) of thickness equals to one and half time of hole diameter. The mean abrasive grain size is 0.015 mm diameter. The feed force = 3.5 N. the amplitude of tool oscillation is 25 microns and the frequency = 25 kHz. The tool material is copper having flow strength = 1.5×10^9 N/m2, the slurry contains one part of abrasive to one part of water. K1 = 0.3, K2 = 1.8×10^{-6} and K3 = 0.6 and abrasive slurry density = 3.8 gm/cc. Also calculate the ratio of volume removed by throwing mechanism to the volume removed by hammering mechanism.	**20**	**CO1**
Q 11	a) Explain the working principal of wire EDM, describe the various system involved in it. b) Discuss the function of an electrolyte with the desirable properties while selecting the electrolyte. OR a) Compare honing and electrochemical honing on the basis of MRR and surface finish. b) Discuss the effect of following process parameters of EDM on MRR and Surface finish:- (i) Current (ii) Spark frequency (iii) Gap between electrode and workpiece (iv) Pulse duration	**20**	**CO2 & CO3**