

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, July 2020

Course: Advanced Manufacturing Technology (MEPD 3007)

Programme: B.Tech ADE

Semester: VI

Time: As per inst.

Max. Marks: 100

Instructions:

Read the instruction carefully before attempting.

2. This question paper has two section, Section A and Section B.

3. There are total of six questions in this question paper. **One** in **Section A** and **five** in **Section B**

4. **Section A** consist of multiple choice based questions and has the total weightage of 25%.

5. **Section A** will be conducted online on BB Collaborate platform

6. **Section B** consist of long answer based questions and has the total weightage of 75%. The questions for section B shall also appear in BB Collaborate

7. The maximum time allocated to **Section A** is one Hrs.

8. **Section B** to be submitted within 24 hrs from the scheduled time (*exceptional provision due extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).

9. No submission of **Section B** shall be entertained after 24 Hrs.

10. **Section B** should be attempted after **Section A**

11. **The section B** should be attempted in blank white sheets (hand written) with all the details like programme, semester, course name, course code, name of the student, Sapid at the top (as in the format) and signature at the bottom (right hand side bottom corner)

SECTION A

S. No.		Marks	CO
1	MCQ (1x25)		
a)	A) Parts machined by ultrasonic machining is having residual stress at their surface. R) Abrasive grains thrown and hammered on the job in ultrasonic machining a) Both A and R are correct and R is a correct explanation A b) Both A and R are correct but R is not a correct explanation A c) A is correct but R is incorrect A is incorrect but R is correct	1	CO1
b)	Vacuum is provided in most of the high energy rate forming process to a) Avoid loss of energy in air b) Avoid contamination of parts by dust in air c) Avoid adiabatic heating of air d) Avoid drag force of air	1	CO1
c)	Which of the following parts cannot be produced HERF process a) Radar dishes b) IC engine Nozzle c) Tube flaring	1	CO1

	Geometry on flat surface.		
d)	For ECM of steel which of the following is used as electrolyte a) Kerosene b) Deionized water c) NaCl d) NHO3	1	CO1
e)	Which of the following statements are correct for ECM process i) Workpiece forms the positive electrode ii) Tool forms the negative electrode iii) Material removal is governed by Faraday's law of electrolysis iv) Tool wear is maximum Options: a) i, ii, iii, iv are correct b) i and iii are correct c) i and ii are correct d) i,ii and iii are correct.	1	CO1
f)	In EDM for drilling Deep holes of small diameter, the tool materials should preferably be made of a) Copper wire b) Brass wire c) Tungsten carbide wire d) Tungsten wire	1	CO1
g)	Which of the following is not a part of EBM setup a) nozzle b) Magnetic lenses c) Vacuum pump. d) Accelerating anode	1	CO1
h)	Full form of LASER is a) Light amplification by stimulated emission of radiation b) Length amplification by stimulated emission of radiation c) Light assessment by stimulated emission of radiation d) Light amplification by striking emission of radiation	1	CO1
i)	Plasma gas and shielding gas serves the sane function in PAM a) True b) False	1	CO1
j)	MRR in USM is more for a) Large abrasive grain b) Small abrasive grain c) Medium size abrasive grain d) Does not depends on abrasive grains	1	CO2
k)	10-micron diameter abrasive grain is used in AJM. If the radius to depth ratio of cavity formed by one the impact of one abrasive is 2 (in brittle material). Depth of the cavity generated is a) 0.5 micron b) 2.5 micron	1	CO2

	c) 20 micron d) 1 micron		
l)	Water jet machining is used to machine a mild steel plate having specific energy of 2000 J/mm^3 . Water coming from the nozzle of 1 mm^2 with the pressure of 1000 bars. MRR of the given process will be (no losses are there) in mm^3/sec . a) 0.22 b) 15.81 c) 17.56 d) 22.36	1	CO2
m)	Glass is being machined at a MRR of $6 \text{ mm}^3/\text{min}$ by Al_2O_3 abrasive grits having a grit dia of $150 \mu\text{m}$. If $100 \mu\text{m}$ grits were used, what would be the MRR? a) 6 b) 13.5 c) 4 d) 12	1	CO2
n)	While removing material from iron (atomic weight 56, valence 2, density 7.8 g/cc) by ECM. MRR of 4 cc/min is desired. Current required for achieving this MRR. a) 896 Amp b) 1000 Amp c) 1500Amp d) 1792 Amp	1	CO2
o)	MRR in ECM depends on a) Hardness of material b) Atomic weight of material c) Thermal conductivity of material d) Ductility of material	1	CO2
p)	MRR in EDM process does not depends on a) Supply voltage b) Thickness of workpiece c) Gap voltage d) R & C of the circuit used	1	CO2
q)	Which of the following is a correct sequence of increasing order of the MRR of the process. a) USM, LBM, EBM, EDM, ECM b) EBM, LBM, USM, ECM, EDM c) LBM, EBM, USM, ECM, EDM d) LBM, EBM, USM, EDM, ECM	1	CO2
r)	Catcher is not needed in which of the following process a) USM b) WJM c) AWJM d) AJM	1	CO3

s)	Which of the following process will give best surface finish a) USM b) AFM c) WJM d) EDM	1	CO3
t)	A) Surface finish in ECM is very high R) ECM involves the atomic level dissolution of material. a) Both A and R are correct and R is a correct explanation A b) Both A and R are correct but R is not a correct explanation A c) A is correct but R is incorrect d) A is incorrect but R is correct	1	CO3
u)	Which of the following method cannot be used for welding as well as machining a) LBM b) EBM c) PAM d) AJM	1	CO3
v)	Which of following method uses an electric arc to create a pressure pulse for the method a) EDM b) Electrohydraulic forming c) Hydraulic forming d) Electromagnetic forming	1	CO1
w)	In RC, type generator maximum supply voltage is 100 volt and breakdown voltage is 80 volts. The capacitance of the circuit is 100 microfarad. Determine the maximum spark energy in joules. a) 0.64 b) 0.32 c) 0.50 d) 1.00	1	CO3
x)	For the maximum power output from RC type generator with the resistance of 10 ohms and capacitance of 200 microfarad. The idle time will be (in microseconds). a) 1.59 b) 1 c) 1.2 d) 0.5	1	CO3
y)	Inter-electrode gap in ECG can be controlled by a) Controlling the pressure of electrolyte flow b) Controlling the applied static load c) Controlling the size of the diamond particle in the wheel d) Controlling the texture of the work piece.	1	CO3
SECTION B			
Q-2	a) Describe the methodology to find out the idle and machining time in electro discharge machining.	7+8	CO2

	<p>b) For spark machining of 5mm x 5mm square through hole in solid low carbon steel plate having thickness of ... (take the last two digits of roll number in mm). A brass tool is used with the kerosene as a dielectric. Resistance and the capacitance in the RC relaxation circuits are 50 ohms and take (last two digits of sap id in microfarad). The supply voltage is 220 volts and the gap is maintained in such a distance that discharge take place at 100+ last two digits of your sap id volts. Estimate the time required to complete the drilling operation. For steel use $MRR = 27.4 P^{1.54}$ where P is power in KW.</p>		
Q-3	<p>a) Giving no motion to the tool in ECM process will leads to drastic increment in the gap with the time. Show that how the gap will increase with the time by deducing the expression for the same.</p> <p>b) Take any steel of your choice (frequently used in automobile industries). Consider that the selected steel is made of Iron and four major alloying elements (total five elements). Make a table showing their atomic weight, valence (lowest) and weight percentage. Assume that your selected alloy is machined by ECM process using 1000AMP current. Find out the MRR of the process.</p>	7+8	CO2
Q-4	<p>Make a poster presentation (hand written) showing following thins about any one of the non-tradition manufacturing process. Use only one A-3 sheet if not available use two A-4 sheets.</p> <p>i) Basic setup ii) Variable and their affects iii) Advantage disadvantage and applications</p> <p>(instruction: you can draw also to show the things. 30% marks will be given on the creativity. In case of plagiarism between the students strict marks deduction will be there for all the students given same content.)</p>	5x3	CO1 and CO3
Q-5	<p>Make a poster presentation (hand written) showing following thins about any one of the high-energy rate forming processes. Use only one A-3 sheet if not available use two A-4 sheets.</p> <p>i) Basic setup ii) Variable and their affects iii) Advantage disadvantage and applications</p> <p>(Instruction: you can draw also to show the things. 30% marks will be given on the creativity. In case of plagiarism between the students strict marks deduction will be there for all the students given same content.)</p>	5x3	CO1 and CO3
Q-6	<p>Do a critical analysis and show the difference between any three advanced manufacturing processes. Touch all the sectors for differentiating like basic setup, methodology, variables, mechanisms etc. Create four column the first column should show the basis of differentiation and the other three would show the content about respective processes.</p>	15	CO3