PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 1

Sem & AY: Odd Sem. 2019-20	Date: 30.9.2019
Course Code: MEC 207	Time: 2:30PM to 3:30PM
Course Name: PRODUCTION TECHINQUE 2	Max Marks: 40
Program & Sem: B.Tech (MEC) & V	Weightage: 20%

Instructions:

i. Read the description carefully
ii. Restrict your answer based on the marks allotted

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries five marks. (4Qx5M=20M)

1. What are the pattern materials? Describe. (C.O.NO.1) [Knowledge]
2. What are the ingredients of moulding sand? Describe. (C.O.NO.1) [Knowledge]
3. Write the classifications and capabilities of the furnaces. (C.O.NO.2) [Knowledge]
4. How does core making different from moulding? Describe the functions of cores (C.O.NO.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer both the Questions. Each Question carries six marks. (2Qx6M=12M)

5. Huge pipes can be manufactured using centrifugal casting techniques, explain the process. (C.O.NO.1) [Knowledge]
6. Melting rate in electric arc furnace is high compare to other process for melting ferrous materials, explain the direct electric arc furnace. (C.O.NO.2) [Knowledge]

Part C [Problem Solving Questions]

Answer the Question. The Question carries eight marks. (1Qx8M=8M)

7. Illustrate the steps involved investment casting. (C.O.NO.1) [Knowledge]

SCHOOL OF ENGINEERING

Semester: 5

Course Code: MEC 207

Course Name: Production Technique 2

Branch & Sem: MEC & 5

Date: 30/9/19

Time: 2:30 pm-3:30 pm

Max Marks: 40

Weightage: 20%

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels			Thought provoking type [Marks allotted] Bloom's Levels			Problem Solving type [Marks allotted]			Total Marks
			K			C			A			
1	CO1	Module 1	5									5
2	CO1	Module 1	5									5
3	CO2	Module 2	5									5
4	CO1	Module 1	5									5
5	CO1	Module 1				6						6
6	CO2	Module 2				6						6
7	CO1	Module 1							8			8
8	CO1	Module 1							8			
	Total Marks											40

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

I here certify that All the questions are set as per the above Sachidananda K B]

Annexure- II: Format of Answer Scheme

SCHOOL OF ENGINEERING

SOLUTION

Semester: 5

Course Code: MEC 207

Course Name: Production Technique 2

Date: 30/9/19

Time: 2:30 pm – 3:30 pm

Max Marks: 40

Weightage: 20%

Part A (4Q x 5M = 20 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	**1.Wood, 2.Metal, 3.Plastic 4. Wax, 5. Quick setting compounds.**	**List- 1M Description of Minimum 4 materials-4M**	**3**
2	**1. Silica sand, 2. Clay 3. Moisture, 4. Additives**	**List- 1M Description of each materials-4M**	**3**
3	**1. Crucible type 2. Electric arc furnace 3. Resistance furnace, 4. Cupola**	**List- 1M Capabilities of each materials-4M**	**3**
4	**Concept of core making**	**Concept of core making-1M Any 4 functions of Core-4M**	**3**

Part B (2Q x 6M = 12 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
5	Centrifugal casting technique	Neat Sketch showing the major parts- 3M Construction and working-2M Advantages Limitations- 1M	15
6	Direct electric arc furnace	Neat Sketch showing the major parts- 3M Construction and working- 2M Advantages Limitations- 1M	15

Part C (1Q x 8M = 8 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
7	Investment casting	Neat Sketch showing the major parts- 4M Construction and working- 2M Advantages, Limitations and applications- 2M	15

8	Shell casting	Neat Sketch showing the major parts- 4M Construction and working- 2M Advantages, Limitations and applications- 2M	15

Roll No.													

GAIN MORE KNOWLEDGE
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PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST –2

Semester: V
Course Code: MEC207
Course Name: PRODUCTION TECHNOLOGIES-2
Program & Sem: B.TECH, MECH ENGINEERING

Date: 18-11-2019
Time: 2.30 to 3.30 PM
Max Marks: 40 MARKS
Weightage: 20%

Instructions:

(i) ***Sketches should be drawn neatly wherever required.***
(ii) ***Answer to all questions are compulsory.***

Part A

Answer the following Questions. Each question carries 5 marks. (4Qx5M= 20 M)

1. Define solidification and briefly explain any three variables of solidification. **(CO-2) [KNOWLEDGE]**
2. Define welding and classify the various fusion welding methods. **(CO-1) [KNOWLEDGE]**
3. Explain the directional solidification process with a neat sketch. **(CO-2) [KNOWLEDGE]**
4. Explain the working of stir casting method of casting aluminium alloy with a neat sketch **(CO-3) [KNOWLEDGE]**

Part B

Answer the following two Questions. Each question carries 8 marks (2Qx8M=16M)

5. Explain the induction degassing method with a neat sketch. **(CO-3) [KNOWLEDGE]**
6. With a neat sketch explain the working of explosive welding. **(CO-3) [KNOWLEDGE]**

Part C

Answer the following Question. Each question carries 4 marks. (1Qx4M=4M)

7. Calculate the melting efficiency for an arc welding process of steel material having a cross sectional area of the weld bead is $20mm^2$. The power supplied is found to be 20 Volts and 200 Amperes. Given that the welding speed is 5mm/s, heat required to melt the molten metal is $10J/mm^3$ and heat transfer efficiency is 0.85. Comment the result evaluated. **(CO-3) [APPLICATION]**

SCHOOL OF ENGINEERING

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

Semester: V

Course Code: MEC 207

Course Name: PRODUCTION TECHNOLOGIES-2

Date: 18-11-2019

Time: 2.30PM to 3.30 PM

Max Marks: 40

Weightage: 20%

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels			Thought provoking type [Marks allotted] Bloom's Levels			Problem Solving type [Marks allotted]			Total Marks
			K			K			A			
1	CO-2	MODULE-2		5								
2	CO-1	MODULE-3		5								
3	CO-2	MODULE-2		5								
4	CO-3	MODULE-3		5								
5	CO-3	MODULE-2					8					
6	CO-3	MODULE-3					8					
7	CO-3	MODULE-3								4		
	Total Marks			**20**			**16**			**4**		

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

Annexure- II: Format of Answer Scheme

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

SCHOOL OF ENGINEERING

SOLUTION

Semester: V
Course Code: MEC207
Course Name: PRODUCTION TECHNOLOGIES-2
Program & Sem: B.TECH, MECH ENGINEERING

Date: 18-11-2019
Time: 2.30 PM to 3.30PM
Max Marks: 40 MARKS
Weightage: 20%

Part A **(4Q x 5M = 20Marks)**

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	Definition of Solidification Explaining any three solidification variables in brief	**2Marks** **3 Marks**	**1 Mins** **2 Mins**
2	Definition of welding Writing the classification tree or listing out various fusion welding methods	**1Marks** **4 Marks**	**1 Mins** **2 Mins**
3	Labelled diagram showing directional solidification process Describing the related process	**2 Marks** **3 Marks**	**2 Mins** **2 Mins**
4	Labelled diagram showing stir casting process Description of the process	**2 Marks** **3 Marks**	**4 Mins** **2 Mins**

Part B **(2Q x 8M = 16Marks)**

Q No	Solution	Scheme of Marking	Max. Time required for each Question
5	Diagram of the Induction furnace with labelling Explanation pertaining to the (Construction and working)	3 Marks 5 Marks	4 Mins 5 Mins
6	Diagram of the explosive welding with labelling Explanation pertaining to the (Construction and working)	3 Marks 5 Marks	4 Mins 5Mins

Part C **(1Q x 4M = 4Marks)**

Q No	Solution	Scheme of Marking	Max. Time required for each Question
7	$\eta_m = \frac{H_m}{\frac{VI}{A_b \times u} \times \eta_h} = \frac{10.}{\left(\frac{20 \times 200.}{20 \times 5} \times 0.85\right)} = 29.41\ \%$ The magnitude of the welding efficiency is less because of the metallurgical losses	1 Mark for the formula 2 Marks for the solution 1 Mark for the comment	6 Mins

Roll No.												

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END TERM FINAL EXAMINATION

Semester: Odd Semester 2019-2020 | **Date**: 26 December 2019

Course Code: MEC 207 | **Time**: 9:30 AM to 12:30 PM

Course Name: PRODUCTION TECHNIQUE - II | **Max Marks**: 80

Program & Sem : B.Tech (MEC) & V | **Weightage**: 40%

Instructions:

(i) All questions are mandatory

(ii) Read all questions carefully and try to manage time according to the marks

Part A [Memory Recall Questions]

Answer all the Questions. **(8Qx2M=16M)**

1. a) List any four pattern materials used in sand casting method. (C.O NO.1) [Knowledge]

   b) In case of sand moulding, doing more ramming will leads to.....strength and .....permeability. Fill in the blanks (C.O NO.1) [Knowledge]

   c) Solidification pattern of a molten metal during casting largely affects its properties. List any two variables affecting solidification process. (C.O NO.2) [Knowledge]

   d) Liquid to solid transformation in solidification happens over.....temperature for pure metals and ..... temperature for alloys. (C.O NO.3) [Knowledge]

   e) Name any two shielding gases used in arc welding techniques. (C.O NO.3) [Knowledge]

   f) Name any two welding techniques which produces leak proof joint. (one arc welding and one resistance welding technique) (C.O NO.3) [Knowledge]

   g) List any two difference between soldering and brazing (C.O NO.3) [Knowledge]

   h) Write any two reasons for undercutting welding defect. (C.O NO.4) [Knowledge]

2. Match the following **(4Qx1M=4M)**

a) Symmetrical shape	p) MIG	[1M] (C.O.No.1) [Knowledge]
b) Batch production	q) TIG	[1M] (C.O.No.1) [Knowledge]
c) Consumable electrode	r) Investment Casting	[1M] (C.O.No.3) [Knowledge]
d) Non Consumable electrode	s) Loam moulding	[1M] (C.O.No.3) [Knowledge]

GAIN MORE KNOWLEDGE
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SCHOOL OF ENGINEERING

END TERM FINAL EXAMINATION

Extract of question distribution [outcome wise & level wise]

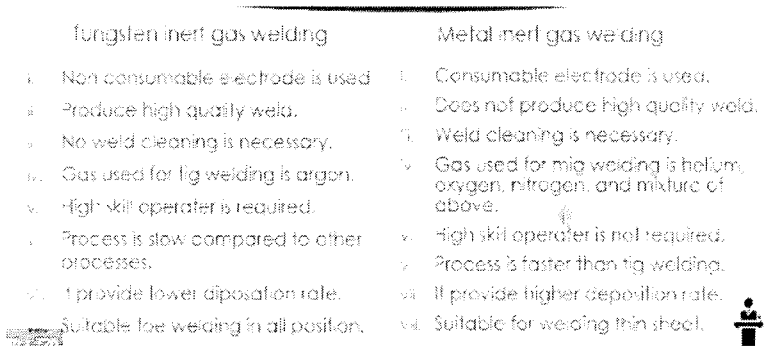
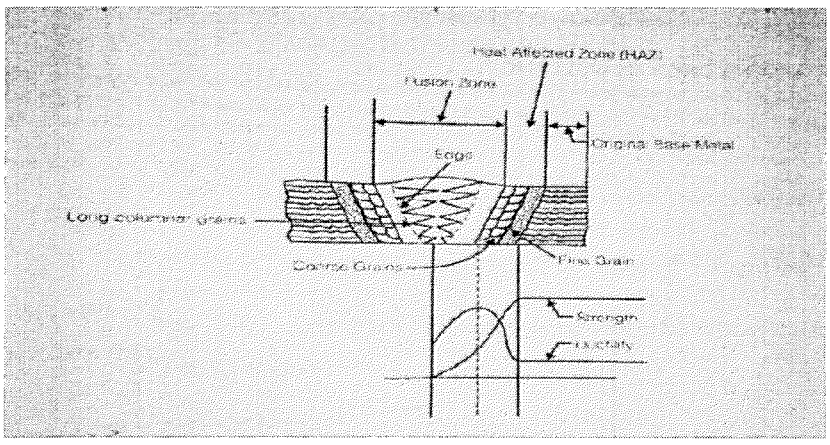
Q.NO.	C.O.NO (% age of CO)	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels	Thought provoking type [Marks allotted] Bloom's Levels	Problem Solving type [Marks allotted]	Total Marks
			K	C	A	
PART A Q. NO1 Q. NO 2	CO 01 CO 02 CO 03 CO 04	All the 4 modules	20 [4+4+6+6]			20
PART B Q.NO.3	CO 01	MODULE 01 CASTING	-	05	-	05
PART B Q.NO.4	CO 02	MODULE 02 Furnaces and Solidification	-	05	-	05
PART B Q.NO.5	CO 03	MODULE 02 Furnaces and Solidification	-	05	-	05
PART B Q.NO.6	CO 03	MODULE 03 Welding	05	-	-	05
PART B	CO 04	MODULE 04	-	05	-	05

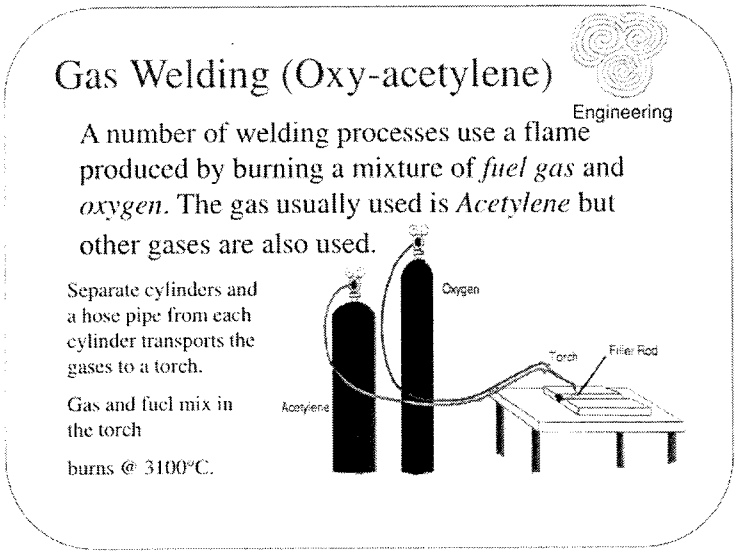
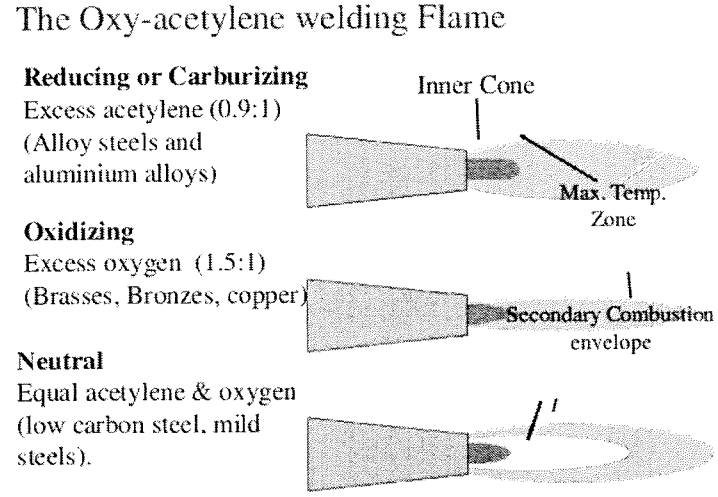
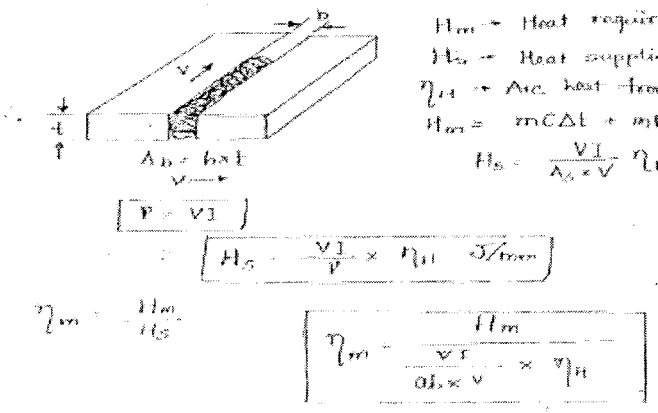
Part A (8Q x 2M+1Q×1M =20 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	a) Wood, Metal, Resin, Plastic, Wax b) More strength Less permeability c) Pouring temperature, alloy composition , chills, chaplets inclusions, cavity design, gate etc d)fixed and range of temperature e)argon, helium, CO2 etc f) Submerged arc welding and seam welding g) any two difference btw soldering and brazing h) steep electrode angle, larger linear speed, high current setting etc	**0.5 marks for each** 1 marks each 1 marks each 1 marks each	15 mins
2)	Symmetrical-loam moulding Batch production- investment casting Consumable electrode-MIG Non consumable electrode-TIG	1 marks each	5 mins

Part B (2Q x 6M = 12Marks)

Q No	Solution	Scheme of Marking	Max. Tim for each

	Difference between TIG and MIG  	Working -2M Application and advantages -1M	10 mins
8)	Heat affected zone (HAZ) ❖ This Zone is the region that experiences a peak temperature that is well below the solidus temperature while high enough that can change the microstructure of the material. ❖ The amount of change in microstructure in HAZ depends on the amount of heat input, peak temp reached, time at the elevated temp, and the rate of cooling. ❖ As a result of these changes in microstructure of the HAZ, this remains the weakest section in the whole weldment.	5 Marks for 5 differences.	10 mins
9)	 	2 marks for figure and 3 marks for explanation	10 mins

12)	  a) any two functions of flux coating in SMAW b)	limitation, applications Figure- 5 marks (gas welding setup and 3 flames) 5 marks for explanation 4 marks for functions	20 mins
13)	 plate thickness is 3.6 mm		20 mins