

KATHMANDU UNIVERSITY
End Semester Examination
March/April, 2017

Marks Scored:

Level : B.E.
Year : II

Course : MEEG 217
Semester: I

Exam Roll No. : Time : 30 mins.

F. M. : 10

Registration No. :

Date : APR 02 2017

SECTION "A"

[20 Q. × 1=20 marks]

Choose the most appropriate answer and mark [X].

1. In machine tools where different components are made of different components, the assembly may jam, or become too loose and vibrate, when the temperature changes. Their design must account and compensate for the materials used their
 ductility density fatigue thermal expansion
2. Which one of the following casting processes is the most widely used
 centrifugal casting die casting
 sand casting investment casting
3. Investment casting is also known by which one of the following names
 fast-payback molding full-mold process,
 lost-foam process lost-wax process
4. The purpose of a riser is to
 deliver molten metal into the mold cavity
 act as a reservoir for the molten metal
 feed the molten metal to the casting in order to compensate for the shrinkage
 deliver the molten metal from pouring basin to gate
5. In which of the following process, heat is created by blacksmith fire
 forge welding spot welding
 projection welding seam welding
6. Oxy-acetylene flame is used to weld
 steel copper alloys stainless steel cast iron
7. In metal cutting operations discontinuous chips are produced while machining
 brittle material ductile material hard material soft material
8. Extrusion is a process of
 pushing the heated billet of metal through an orifice
 producing a hole by a punch
 making cup shaped parts from the sheet metal
 none of the above
9. Knurling is an operation of
 cutting smooth collars under cutting
 roughing the surface for hand grip none of the above

10. Counter-boring is the operation of
 enlarging the end of a hole cylindrically
 cone-shaped enlargement of the end of a hole
 smoothing and squaring the surface around a hole
 sizing and finishing a hole
11. A connecting rod is made by
 casting drawing forging extrusion
12. Pre-heating before welding is done to
 make the steel softer burn away oil, grease, etc, from the plate surface
 prevent plate distortion prevent cold cracks
13. Seamless tube can be produced by
 two high rolling mill ring rolling combined with stretch forming
 piercing steam hammering forging
14. Tool life of the cutting tool is most affected by
 cutting speed tool geometry
 cutting feed and depth microstructure of material being cut
15. Which of the following tool is used for turning?
 multi point cutting tool single point cutting tool
 hand tool end cutting tool
16. A tool has a life of 9 min when cutting at 250 m/min. Calculate the cutting speed for the same tool to have a tool life of 160 min. Take Taylor tool life parameter $n = 0.22$.
 133 m/min 153 m/min 163 m/min 173 m/min
17. Tool life of 9 min was obtained during straight turning of a 24 mm diameter steel bar at 300 rpm with HSS tool. When the same bar was turned at 250 rpm, the tool life increased to 48.5 min. What will be the tool life at a speed of 280 rpm?
 13 min 17 min 21 min 27 min
18. A mild steel work-piece is being machined by two different tools A and B under identical machining conditions. The tool life equations for these tools are: For tool A: $VT^{0.32} = 42.5$ & for tool B: $VT^{0.45} = 88.6$ Where 'V' and 'T' are in m/sec and sec respectively. Determine the cutting speed above which tool B will give better tool life.
 1 m/sec 3 m/sec 5 m/sec 7 m/sec
19. The sand in its natural or moist state is called as
 green sand loam sand dry sand none of the above
20. The patterns which are made in two or more pieces are called as
 solid patters split patterns
 loose piece patterns none of the above

Level : B.E.
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Time : 2 hrs. 30 mins.

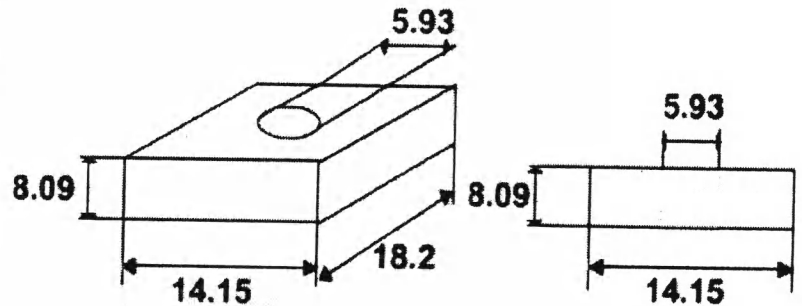
Course : MEEG 217
Semester: I
F. M. : 55

Attempt all questions. Supply figures wherever necessary. Assume data, if missing.

SECTION "B"

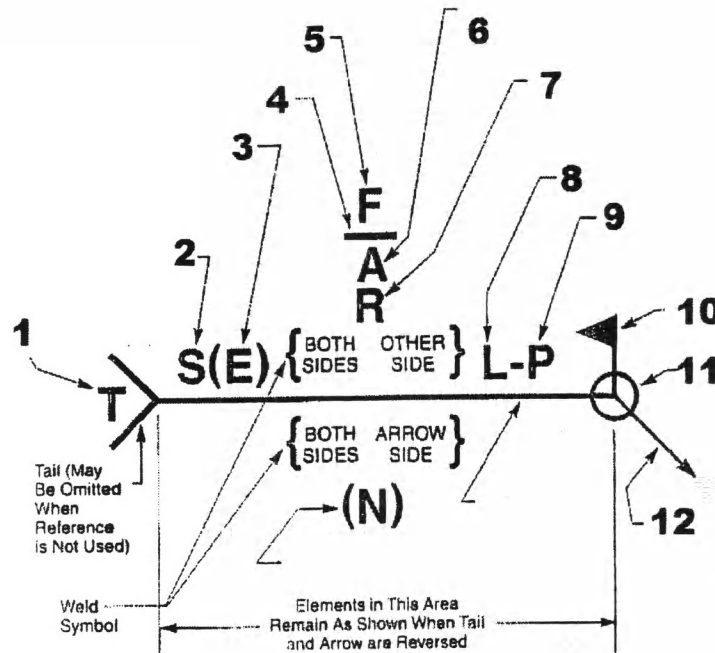
1. What are the common allowances provided on pattern and why? The casting shown is to be made in cast iron using a wooden pattern. Assuming only machining allowance, calculate the dimension of the pattern. *All Dimensions are in Inches* [2+2=4]

Metal	Dimension (inch)	Allowance (inch)
Cast Steel	Up to 6	0.12
	6 to 20	0.25
	20 to 40	0.3
Cast Iron	Up to 12	0.12
	12 to 20	0.2
	20 to 40	0.25
Non ferrous	Up to 8	0.09
	8 to 12	0.12
	12 to 40	0.16



2. Define the following terms with neat sketch as used in sand casting
(i) Core (ii) Core-prints (iii) Sprue (iv) Runner (v) Riser [5×1=5]
3. Differentiate between shaper and planer. [4]
4. Discuss the principle of metal arc welding. What are its salient features? Mention its advantages and applications. [4]
5. Differentiate between hot and cold working of metals. Mention two advantage and disadvantages of each of these techniques. [4]
6. Define rolling process. Using schematic diagram and state the difference between cluster mills and continuous rolling. [4]
7. Describe the various kinds of patterns in use. What is the function of core in casting? [4]
8. Define the following terms: *Drawing, Embossing & coining* [3]

9. Draw labeled diagram of three types of flame used in Oxy-acetylene gas welding. Also give their uses. [4]
10. Explain soldering process. How it differs from brazing and welding? Write the uses of soldering and brazing. [4]
11. Briefly explain the projection welding process. Also give its advantages and disadvantages. [3]
12. Figure below shows the standard location of the elements of a welding symbol of *American Welding Society Welding Symbol Chart*. Complete the missing information pointed arrowheads 1 to 12. [0.5x12=6]



13. Calculate the time required to machine a work-piece 180 mm long 70 mm diameter to 175 mm long, 60 mm diameter. The work-piece rotates at 450 r. p. m., feed is 0.3 mm/rev and maximum depth of cut is 2 mm. Assume total approach and overall travel distance as 6 mm for turning operation. [6]