KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

Marks Scored:

Level : B.E.
Year : II

Course : MEEG 217
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : 30 JUN 2023

SECTION "A"
[20 Q. × 1 = 20 marks]

Mark [X] in the most appropriate option

1. In which of the following machine, the work is usually rotated while the drill is fed into work?
   [ ] Sensitive drilling machine
   [ ] Radial Drilling machine
   [ ] Gang drilling machine
   [ ] Deep hole drilling machine

2. As the cutting speed increases, the tool cutting forces
   [ ] Remain Constant
   [ ] Increases
   [ ] Decreases
   [ ] First increase and then Decrease

3. One of the assumptions behind calculating orthogonal cutting forces is,
   [ ] that the rake angle is positive.
   [ ] that the tool is only cutting with one edge and one point.
   [ ] the shear plane is a function of before and after chip thicknesses.
   [ ] that the rake angle is null.

4. In drilling softer materials, the cutting speed is ___ as compared to harder materials.
   [ ] Same [ ] High [ ] Low [ ] None of these

5. When the temperature of a solid metal increases,
   [ ] Strength of the metal decreases but ductility increase.
   [ ] Both ductility and strength of metal decreases
   [ ] Strength of metal increases but ductility decreases
   [ ] Both ductility and strength of metal increases

6. The strength of a brazed joint
   [ ] Decreases with increase in gap between the two joining surfaces.
   [ ] Increases with increase in gap between the two joining surfaces.
   [ ] Decreases up to certain gap between the two joining surfaces beyond which it increases.
   [ ] Increases up to certain gap between the two joining surfaces beyond which it decreases.

7. Type of welding defect caused due to poor deposition of weld rod is
   [ ] Porosity [ ] under fill [ ] Undercut [ ] Crack

8. Hot rolling of mild steel is carried out
   [ ] At recrystallization temperature
   [ ] Between 100°C to 150°C
   [ ] Between recrystallization temperature
   [ ] Above recrystallization temperature

9. In Gating system, the ratio 1:2:4 represents
[ ] Sprue base area: in gate area: casting area
[ ] Sprue base area: runner area: in gate area
[ ] Pouring basin area: in gate area: runner area
[ ] Runner area: in gate area: casting area

10. Two streams of liquid metal which are not hot enough to fuse properly result into a casting defect is known as
[ ] Sand wash [ ] Swell [ ] Cold shut [ ] Scab

11. An expendable pattern is used in
[ ] Slush casting [ ] Investment casting
[ ] Squeeze casting [ ] Centrifugal casting

12. The ductile materials, during machining, produce
[ ] Continuous chips [ ] Continuous chips with built up edge
[ ] Serrated chips [ ] Built up edge

13. In an orthogonal cutting, the depth of cut is halved and the feed rate is double. If the chip thickness ratio is unaffected with the changed cutting conditions, the actual chip thickness will be
[ ] Doubled [ ] Quadrupled [ ] Halved [ ] Unchanged

14. In metal machining, the zone where the heat is generated due to friction between the moving chip and the tool face, is
[ ] Friction zone [ ] Shear zone
[ ] Work-tool contact zone [ ] Relief zone

15. The process of removing metal by a cutter which is rotated in the same direction of travel of work piece, is called
[ ] Up milling [ ] End milling [ ] Face milling [ ] Down milling

16. The hard grade grinding wheels are denoted by the letters
[ ] A to G [ ] P to Z [ ] H to O [ ] A to M

17. The lathe centers are provided with standard taper known as
[ ] Morse taper [ ] Chapman taper
[ ] Seller's tape [ ] Brown and Sharpe taper

18. The stroke of a shaping machine is 250 mm. It makes 30 double strokes per minute. The overall average speed of operation is
[ ] 3.75 m/min [ ] 15 m/min [ ] 5 m/min [ ] 7.5 m/min

19. In DC arc welding, if leads are arranged in work as Negative pole of the welding arc and electrode as Positive pole of the welding arc, the arrangement is known as
[ ] Fusion [ ] Forward welding
[ ] Reverse polarity [ ] Direct polarity

20. In single point cutting tool, when the shear angle is large
[ ] Path of shear is short and chip is thin [ ] Path of shear is large and chip is thick
[ ] Path of shear is large and chip is thick [ ] Path of shear is large and chip is thin

KATHMANDU UNIVERSITY
End Semester Examination
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30 JUN 2023

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

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

SECTION "B"

[5Q × 11 = marks]

Attempt *ALL* questions. Assume suitable data if necessary.

1.

a. What considerations is taken while choosing a lubricant for metal forming process? What is residual stress in cold working and how can we cope it in wire drawing process? What are the features of a draw die describe, it with labeled diagram? [2+3+3]

b. Calculate the Feed required to drill in a cast iron flange each of 2 cm depth, if the hole diameter is 2 cm. Assume cutting speed as 21.9 m/min. and feed 0.2 per revolution in mm. Find the required feed for the Drilling operation. [3]

2.

a. What are the Process Variables in Direct extrusion process? [3]

b. A cylinder with a diameter of 1 cm. and height of 3 cm. solidifies in three minutes in a sand casting operation. What is the solidification time if the cylinder height is doubled? What is the time if the diameter is doubled? (Take exponent n= 2). [8]

3.

a. What are methods of maximizing fatigue life of a product? [3]

b. A-20 mm in thickness of metal plate (melting point of 580^0 C) will be formed to reduce the thickness at the temperature of 23^0C. Determine whether the process is cold, warm or Hot Working. [3]

c. Two steel sheets of 1 mm thickness are resistance welded in a projection welding with a current 30000A for 0.005 second. The effective resistance of the joint can be taken as 100 Micro ohms. The joint can be considered as a cylinder of 5mm diameter and 1.5 mm height. The density of steel is 0.00786 gram/mm^3.If volume of the joint is 29.45mm^3 and heat required for melting steel is 10J/mm^3. Calculate the percentage of Heat loss to the surrounding. [5]

4. Describe various production defects in details, with labeled diagram. [4+4+3]
a. Welding Defect b. Casting Defect c. Extrusion Defect

5.

a. A strip of metal is originally 1.0 m long. It is stretched in three steps; first to a length of 1.5 m. then to 2.5 m, and finally to 3.0 m. Show that the total true strain is the sum of the true strains in each step, that is, that the strains are additive. Show that, using engineering strains, the strain for each step cannot be added to obtain the total strain. [6]

b. What are the Properties of moulding sand. Describe the cooling and solidification effect on pure metal and alloy with labeled diagram and graphical representation? [5]