KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks scored:

Level : B.E.
Year : II

Course : MEEG 217
Semester : I

Exam Roll No. :

Time: 30 mins.

F.M : 20

Registration No. :

Date 12 MAR 2019

SECTION "A"
[20 Q. × 1 = 20 marks]

Choose and mark "X" in the most appropriate answer.

1. In DC Welding, the straight polarity (electrode negative) results in
   [ ] lower penetration [ ] lower deposition rate
   [ ] less heating of work piece [ ] smaller weld pool

2. Penetration in welding is increased by
   [ ] increasing welding current and welding speed
   [ ] increasing welding current and decreasing welding speed
   [ ] decreasing welding current and welding speed
   [ ] decreasing welding current and increasing welding speed

3. Which one among the following processes uses non-consumable electrode?
   [ ] Gas metal arc welding [ ] Submerged arc welding
   [ ] Tungsten inert gas welding [ ] Flux coated arc welding

4. The time taken to drill a hole through a 25mm thick plate with the drill rotating at 300rpm and moving at a feed rate of 0.25mm/rev is
   [ ] 10 sec [ ] 20 sec [ ] 60 sec [ ] 100 sec

5. Friction at the tool chip interface can be reduced by
   [ ] decreasing the rake angle [ ] increasing the depth of cut
   [ ] decreasing the cutting speed [ ] increasing the cutting speed

6. During orthogonal cutting of MS with a 10 degree rake angle the tool chip thickness ratio was obtained as 0.4. Then the shear angle will be
   [ ] 6.9 [ ] 20.2 [ ] 22.9 [ ] 50.4

7. The hardness of grinding wheel is determined by
   [ ] Hardness of abrasive grains
   [ ] Ability of the bond to retain the abrasives
   [ ] Hardness of the bond
   [ ] Ability of the grinding wheel to penetrate the work-piece

8. Converging of passage is used for feeding the liquid molten metal into the mould to
   [ ] increase the rate of feeding
   [ ] quickly break off the protruding portion of the casting
   [ ] decrease wastage of cast metal
   [ ] avoid aspiration of air

9. Hot Rolling of mild steel is carried out at
[ ] at recrystallization temperature
[ ] between 100 to 150° C
[ ] below Recrystallization temperature
[ ] above Recrystallization temperature

10. In a Rolling process, the state of stress of the material undergoing deformation is
[ ] Pure Compression
[ ] Pure Shear
[ ] Compression and Shear
[ ] Tension and Shear

11. The hot tearing in a metal casting is due to
[ ] High Fluidity
[ ] High Melting Temperature
[ ] Wide range of Solidification Temperature
[ ] Low co efficient of Thermal Expansion

12. In a Gating system, the ratio 1 : 2 : 4 represents
[ ] Sprue Base Area: Runner Area: Ingate Area
[ ] Sprue Base Area: Ingate Area: Runner Area
[ ] Runner Area: Sprue Base Area: Ingate Area
[ ] Sprue Base Area: Runner Area: Casting Area

13. The Solidification time of a casting is proportional to $(V/A)^{2}$, where V is the volume of the casting and A is the total casting surface area losing heat. Two cubes of same material and size are cast using sand casting processes. The top face of one of the cubes is completely insulated. The ratio of the solidification time for the cube with top face insulated to that of the other cube is
[ ] 25/36 [ ] 36/25 [ ] 1 [ ] 6/5

14. Within the Heat Affected Zone in a fusion welding process, the work material undergoes
[ ] microstructural changes but does not melt
[ ] neither melting nor microstructural changes
[ ] both melting and microstructural changes after solidification
[ ] melting and retains the original microstructure after solidification

15. Extrusion is a process of
[ ] pushing the heated billet of metal through an orifice
[ ] producing a hole by a punch
[ ] making a cup shaped parts from the sheet metal
[ ] roughing the surface for Hand grip

16. Preheating before welding is done to
[ ] make the steel softer
[ ] burn away oil, grease etc from the plate
[ ] prevent plate distortion
[ ] prevent cold cracks

17. What term defines Plastic Instability in Tension
[ ] dP = constant [ ] $dP = 0$ [ ] $dP < 0$ [ ] $dP > 0$

18. In highly ductile materials, toughness _____ with the strain hardening.
[ ] increases [ ] decreases
[ ] remains unchanged [ ] first increases and Decreases

19. In Metal Cutting Operation, discontinuous chips are produced while machining is
[ ] Brittle material [ ] Ductile material
[ ] Hard material [ ] Soft material

20. Which of the following casting technique is the best technique for casting tubes and hollow pipes?
[ ] Die Casting [ ] Slush Casting
[ ] Centrifugal Casting [ ] Investment Casting

KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

12 MAR 2019

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

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

SECTION "B"
[11 Q. × 5 = 55 marks]

Attempt ALL questions. Supply figures wherever necessary. Assume suitable data if necessary.

1. What is Manufacturing Process, Discuss Important considerations to be made while selecting Manufacturing Processes and while selecting Materials for improving manufacturing process?

2. A paper clip is made of wire 1 mm in diameter. If the original material from which the wire is made is a rod 15 mm in diameter, calculate the longitudinal and diametrical engineering and true strains that the wire has undergone.

3. Discuss Instability in Tension, Prove that the value of true strains at the onset of necking is equal to strain hardening exponent.

4. A Steel block of length 40 mm and width 60 mm is being milled using a slab milling cutter with 50 mm diameter. The feed of the table is 15 mm/min. The milling cutter rotates at 50 RPM in clockwise direction and width of cut is equal to the width of the work-piece. The thickness of the work-piece. The thickness of the work-piece is 25 mm. The depth of cut of 2 mm is used then find out cutting speed and volumetric material removal rate (MRR).

5. Derive a Merchant Theory using suitable diagrams and determine the different forces act while Metal Cutting.

6. Discuss the Working principles of Shaper and Planar and differentiate them.

7. What are the defects that occur during an arc welding process? List out the most common arc welding defects and explain each of them mentioning their cause and remedy.

8. How a prediction of Solidification Time is attained, explain. And Discuss shrinkage in Solidification and Cooling.

9. Discuss about Casting and List types of Expendable Mold Casting Process. And Explain Shell Mold Casting and Investment Casting.

10. Classify Extrusion Processes in Metal Forming Process and explain the processes based on direction and working temperature.

11. Write Short Notes on
    a. Strain Hardening
    b. Chevron Cracking in Extrusion
    c. Straight and Reverse Polarity
    d. Spot Welding
    e. True Stress and True Strain