Marks Scored:

KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2018

Level : B.E.
Year : II

Course : MEEG 217
Semester: I

Exam Roll No. :
Registration No.:

Time: 30 mins.

F. M. : 20
Date MAR 1 1 2018

SECTION "A"
[20Q × 1 = 20 marks]

Choose the most appropriate answer and mark [X]

1. Two plates of the same metal having equal thickness are to be butt welded with electric arc. When the plate thickness changes, welding is achieved by
[ ] adjusting the current [ ] adjusting the duration of current
[ ] changing the electrode size [ ] changing the electrode coating

2. Which of the following process is used to convert larger sections, such as ingots into smaller sections?
[ ] hot forging [ ] hot spinning [ ] hot extrusion [ ] hot rolling

3. Which of the following open die forging operation reduces the height of a forging and increases its diameter?
[ ] cogging [ ] upsetting [ ] expanding [ ] hollow forging

4. Bolts are produced by
[ ] upset forging [ ] hammer forging [ ] press forging [ ] hot bar forging

5. Good surface finish and better dimensional accuracy can be achieved in
[ ] cold working process [ ] hot working process
[ ] hot and cold working processes [ ] welding process

6. As compared to the arc welding, the gas welding takes
[ ] considerably less time for the metal to heat up
[ ] considerably more time for the metal to heat up
[ ] approximately same time for the metal to heat up as arc welding
[ ] unpredictable

7. Which flame is suitable for cutting operations?
[ ] oxidizing flame [ ] carburizing flame [ ] neutral flame [ ] normal flame

8. Which welding process is used to join two thick plates in one single pass?
[ ] Oxy-acetylene welding [ ] Gas tungsten arc welding (TIG)
[ ] Gas metal arc welding (MIG) [ ] Electro slag welding

9. The method of joining metal surface by introducing a non-ferrous alloy with melting point around above 450 ^{0}C is known as
[ ] Soldering [ ] Brazing [ ] Welding [ ] Fusion welding

10. Metal in machining operation is removed by
[ ] tearing chips [ ] distortion of metal
[ ] shearing the metal across a zone [ ] cutting the metal across a zone

11. If the metals are ductile and the cutting speed is high, then
[ ] continuous chips are formed [ ] discontinuous chips are formed
[ ] serrated chips are formed [ ] continuous chips with built-up edges are formed

12. Reaming is a process used for
[ ] creating a circular hole in metals [ ] cutting a slot on the existing hole surface
[ ] finishing an existing hole surface [ ] making non-circular holes in metals

13. In a shapermachine, themechanismfor tool feed is
[ ] Geneva mechanism [ ] Whitworth mechanism
[ ] Ratchet and Pawl mechanism [ ] Ward-Leonard system

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. The gating ratio 2: 8: 1 for copper in gating system design refers to the ratio of areas of
[ ] Sprue: Runner: Ingate [ ] Runner: Ingate: Sprue
[ ] Ingate: Runner: Sprue [ ] Runner: Sprue: Ingate

16. Chills are used in moulds to
[ ] reduce the possibility of blowholes
[ ] achieve directional solidification
[ ] reduce freezing time
[ ] smoothen metal flow for reducing splatter

17. Misrun is a casting defect which occurs due to
[ ] very high pouring temperature of the metal
[ ] insufficient fluidity of the molten metal
[ ] absorption of gases by the liquid metal
[ ] improper alignment of the mould flasks

18. The purpose of riser in casting process is to
[ ] feed the molten metal to the casting in order to compensate for shrinkage
[ ] deliver the molten metal from the pouring basin
[ ] act as a reservoir for the molten metal
[ ] deliver the molten metal from the pouring basin to the gate

19. The property of sand due to which gas and steam escapes from sand is
[ ] cohesiveness [ ] flow ability [ ] collapsibility [ ] permeability

20. Which method is used for non-symmetrical castings?
[ ] true centrifugal casting [ ] semi centrifugal casting
[ ] centrifuge casting [ ] slush casting

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SECTION "B"

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

1. What is the mechanism of chip formation? Explain in detail about the types of chip formation in machining process. [2+4]

2. List all types of milling operations and explain in detail. [4]

3. Define re-crystallization temperature. Differentiate hot working and cold working of metals. List its advantages, disadvantages and applications. [1+2+2]

4. What is forging and list the types. Also make a detailed comparison of forging processes with machining and casting processes. [1+4]

5. Classify welding processes and explain the principle of electric arc welding with it salient features. [1+4]

6. Explain MIG welding process in detail. List its advantages, disadvantages and applications. [4]

7. Describe with neat sketch, the various operations in mould making with use of core. What is the function of core in casting? [4]

8. Describe solidification process in detail for pure metal and alloys. Explain how to determine solidification time using Chvorinov's rule. [2+3]

9. Discuss [2×6]
   a. Sprue design
   b. Types of gating system in casting
   c. Types of flames in welding
   d. Difference between Shaper and Planar
   e. Mold shift and scab
   f. Flowability, Permeability, Cohesiveness and Refractoriness

10. Give a reason: [1×5]
   a. How a directional solidification is achieved, and when it is required.
   b. How a buoyancy force created by a molten metal in mould affects core and how it must be controlled.
   c. How straight and reverse polarity were chosen in welding.
   d. How a grain structure in metal ingots transform,when hot rolled.
   e. Why wheel dressing is done in grinding wheels.