

FRM106, Production Technology, Preparatory Year, Spring 2020 (Prof. Dr. Ahmed El-Assal)

Write a brief essay about one of the following subjects. Select the assignment number that is coincides with your number in your section names list.

- على كل طالب ان يتخير احد الموضوعات التي يتوافق رقمه في السكشن مع احد الأرقام امام الموضوع. على الا يقل البحث عن ٥ صفحات ولا يزيد عن عشر صفحات. ويتم كتابة البحث طبقا للتعليمات المنشورة على موقع الكلية.
- يجب الا تتطابق الأبحاث والا سوف يعتبر التطابق غشاً لكل الأبحاث المتطابقة ويؤدي الى رسوب اصحابهم.

SUBJECTS FOR DISCUSSION

Numbers: 1, 8

SUBJECT 1

- Write short notes on:
 - i. Pig iron
 - ii. Grey cast iron
 - iii. White cast iron
 - iv. Ductile cast iron
 - v. Malleable cast iron.
- What is brass? Describe the composition, properties and uses of important types of brasses?
- Write short notes on the following:
 - i. Slush casting
 - ii. Pressed casting
 - iii. De Lavaud process for centrifugal casting
 - iv. Moore sand spun process for centrifugal casting.
- Write Short notes on:
 - i. Drop forging
 - ii. Press forging
 - iii. Flattening
 - iv. Smith's Forge
 - v. Pedestal grinder
 - vi. Power hammers
- Write short notes on:
 - i. Welding rods
 - ii. Fluxes
 - iii. Gas flames
 - iv. Working of pressure regulators
 - v. Working pressure of gases in H.P and L.P welding and cutting.
- Describe using appropriate drawings one of the conventional turning machine, with most common tools used and basic operations.

Numbers: 2, 9

SUBJECT 2

- Write short notes on:
 - i.* Stainless steel
 - ii.* High speed steel
 - iii.* Designation of steels.
- What is bronze? Describe the composition, properties and uses of different types of bronzes?
- List the defects generally occurring from the following, stating the precautions necessary to prevent them:
 - i.* Improper pouring technique,
 - ii.* Use of defective gating system
 - iii.* Poor or defective cores,
 - iv.* High moisture content in sand.
- Sketch and describe the following forging tools
 - i.* Anvil.
 - ii.* Swage Block,
 - iii.* Set hammers
 - iv.* Punches,
 - v.* Drift, and
 - vi.* Hardie
- Write short notes on the following:
 - i.* Hoses
 - ii.* Torch tip
 - iii.* Welding torch and its parts
 - iv.* Welding goggles
 - v.* Wire brush
 - vi.* Filler rod in gas welding
- Describe using appropriate drawings vertical milling machine, with most common tools used and basic operations.

Numbers: 3, 10

SUBJECT 3

- What is wrought iron? Discuss in brief its chemical composition, properties and applications.
- Discuss the properties and uses of the following non-ferrous metals:
 - i.* Lead
 - ii.* Tin
 - iii.* Nickel.
 - iv.* Plutonium
- Discuss briefly the causes and remedies of the following casting defects:
 - i.* Blow holes,
 - ii.* Porosity,
 - iii.* Hot tears
 - iv.* Shrinkage cavities,
 - v.* Scabs
 - vi.* Gas porosity
- Write Short notes on:
 - i.* Drop forging
 - ii.* Press forging
 - iii.* Flattening
 - iv.* Smith's Forge
 - v.* Pedestal grinder
 - vi.* Power hammers
- Write short notes on:
 - Arc crater
 - Arc blow
 - Electrode
 - Flux
- Describe using appropriate drawings a horizontal milling machine, with most common tools used and basic operations.

Numbers: 4, 11

SUBJECT 4

- What are plain carbon steels? Discuss in brief the classification of plain carbon steels and also state few applications of different plain carbon steels.
- Discuss the various types of nickel alloys?
- Write short notes on the following casting defects:
 - i.* Sand inclusions,
 - ii.* Cuts and washes,
 - iii.* Misrun and cold shuts,
 - iv.* Honey combing,
 - v.* Metal penetration,
 - vi.* Drops,
 - vii.* Warpage and
 - viii.* blow holes
- Explain with neat sketches the following forging operations:
 - i.* Upsetting,
 - ii.* Drawing down,
 - iii.* Bending,
 - iv.* Drifting,
 - v.* Punching,
 - vi.* Welding
 - vii.* Fullering
- Write short notes on the following:
 - i.* Hoses
 - ii.* Torch tip
 - iii.* Welding torch and its parts
 - iv.* Welding goggles
 - v.* Wire brush
 - vi.* Filler rod in gas welding
- Describe using appropriate drawings the quick return shaper machine, with most common tools used and basic operations.

Numbers: 5, 12

SUBJECT 5

- What are alloy steels? Discuss in brief the effects of alloying elements on steel.
- Discuss the properties and uses of the following non-ferrous metals:
 - i.* Copper
 - ii.* Zinc
 - iii.* Aluminium
 - iv.* Magnesium
- Explain the causes and remedies of the following casting defects:
 - i.* Fins
 - ii.* Shot metal
 - iii.* Shifts
 - iv.* Hard spots
 - v.* Run out
 - vi.* Rattails or buckles
 - vii.* Fusion
 - viii.* Swells
 - ix.* Crushes
- Sketch and describe the following forging tools
 - i.* Anvil.
 - ii.* Swage Block,
 - iii.* Set hammers
 - iv.* Punches,
 - v.* Drift,
 - vi.* Hardie
- Write short notes on:
 - i.* Arc crater
 - ii.* Arc blow
 - iii.* Electrode
 - iv.* Flux
- Describe using appropriate drawings a drilling machine, with most common tools used and basic operations.

Numbers: 6, 13

SUBJECT 6

- How are alloy steels classified?
- Explain the various types of Aluminium alloys giving their composition, properties and uses?
- Write short notes on the following inspection methods:
 - i.* Visual inspection
 - ii.* Pressure test
 - iii.* Penetrate testing
 - iv.* Radiography
 - v.* Magnetic particle testing
 - vi.* Ultrasonic testing.
- Write Short notes on:
 - i.* Drop forging
 - ii.* Press forging
 - iii.* Flattening
 - iv.* Smith's Forge
 - v.* Pedestal grinder
 - vi.* Power hammers
- Write short notes on:
 - i.* Welding rods
 - ii.* Fluxes
 - iii.* Gas flames
 - iv.* Working of pressure regulators
 - v.* Working pressure of gases in H.P and L.P welding and cutting.
- Describe using appropriate drawings vertical milling machine, with most common tools used and basic operations.

Numbers: 7, 14

SUBJECT 7

- What are plain carbon steels? Discuss in brief the classification of plain carbon steels and
- Which are the main metals used in nuclear energy? Describe them in brief.
- Write short notes on the following inspection methods:
 - i.* Visual inspection
 - ii.* Pressure test
 - iii.* Penetrate testing
 - iv.* Radiography
 - v.* Magnetic particle testing
 - vi.* Ultrasonic testing.
- Sketch and describe the following forging tools
 - i.* Anvil.
 - ii.* Swage Block,
 - iii.* Set hammers
 - iv.* Punches,
 - v.* Drift, and
 - vi.* Hardie
- Write short notes on the following:
 - i.* Hoses
 - ii.* Torch tip
 - iii.* Welding torch and its parts
 - iv.* Welding goggles
 - v.* Wire brush
 - vi.* Filler rod in gas welding
- Describe using appropriate drawings a lathing machine, with most common tools used and basic operations.