Take Test: Module A sample questions

Test Information

Description

Instructions

Multiple Attempts This Test allows multiple attempts.

Force Completion This Test can be saved and resumed later.

Your answers are saved automatically.

QUESTION 1

4 points Save Answer

Please match the following descriptions to the Materials, Resources and Processes, for the production of polyethylene bags.

- \- Hydrocarbon reservoirs
- \- Crude oil
- \- Ethylene
- \- Polyethylene sheets
- \- Drilling
- \- Refining
- \- Extrusion and blowing

A. Bulk Material
B. Process that converts raw material to bulk chemical
C. Engineering Material
D. Natural resources
E. Process that converts the engineering material to the end product
F. Process that converts resource to raw material
G. Raw material

QUESTION 2

4 points Save Answer

A composite material is made from metal fibres in an epoxy matrix. Give the following data for elastic modulus, estimate the volume fraction of metal fibres required to make up a composite elastic modulus of 42 GPa.

Yield strenth of epoxy matrix is 1.1 GPa

Yield strength of metal fibres is 68 GPa

Give your answer to 2 decimal places.

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Question Completion Status:

Material	Yield Strength (MPa)	Ultimate Tensile Strength (MPa)	Elongation at Fracture (%)	Fracture Strength (MPa)	Young's Modulus (GPa)
A	840	840	0.1	830	390
B	12	36	200	32	1.4
C	425	460	8	445	75
D	125	150	25	130	75
E	170	360	20	295	121
F	775	1060	9.4	950	200

- Material C
- Material D
- Material A
- Material F
- Material B

I. is very likely the hardened version of Material D?

II. is the strongest?

III. is most likely to have the highest melting point?

IV. is the closest to a rubbery polymer?

V. exhibits an almost identical elastic region to Material C, up to the lowest yield point of both?

QUESTION 4

4 points Save Answer

In geophysics, which physical property ***cannot*** be detected using electromagnetic, magnetic or seismic methods?

- Thermal conductivity
- Electrical conductivity
- Bulk density
- Magnetic susceptibility
- Acoustic velocity

QUESTION 5

5 points Save Answer

Calculate how much energy is required to grind an ore from an F_{80} 294 microns down to a P_{80} 34 microns, if the Bond Word Index of the ore was 14.48 kWh/t. Give your answer in kWh/t to 1 decimal place.

QUESTION 6

3 points Save Answer

Which of the following statement(s) is ***correct***?

- [ ] Nanomaterials have low embodied energy and carbon footprint because they are small.

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Question Completion Status:

- [ ] The surface area of a material decreases when converting it to nano-particles.

QUESTION 7 **4 points** Save Answer

Which of the following statement(s) is ***correct***?

- [ ] 3D printing is also called additive manufacturing
- [ ] 3D printing is an alternative manufacturing process that uses only renewable resources to make end products.
- [ ] 3D printing is generally a fast process, compared to conventional manufacturing methods.
- [ ] An object can be created by 3D printing by adding layers of material.
- [ ] 3D printing is an alternative manufacturing process that converts raw/bulk materials to end products.

QUESTION 8 **3 points** Save Answer

Which of the following statements is true (may be more than one answer)

- [ ] Hydrogen has the highest heating value of all fuels.
- [ ] A thermal battery stores heat energy.
- [ ] Transport powered by fossil fuels emits no greenhouse gases.
- [ ] Hydrogen has zero carbon footprint in its life cycle as a fuel.
- [ ] Hydrogen can be made by gasification of biomass.

QUESTION 9 **4 points** Save Answer

A cradle-to-grave Life Cycle Analysis (LCA) consists of 5 distinct steps. Order the following from 1 to 5:

- \- Product manufacture
- \- Raw materials acquisition
- \- Product disposal
- \- Material manufacture
- \- Product use

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Question Completion Status:

Your team has 3 sets of seismic data from 3 locations and has to decide which one to recommend for drilling.

	Site 1	Site 2	Site 3
$Z_{bottom\ layer}$	5×10^6	4.5×10^6	5.7×10^6
$Z_{top\ layer}$	1.5×10^6	2.5×10^6	1.2×10^6

Order the sites according to which one you think has the most likelihood of finding a resource underneath.

- Site 1
- Site 2
- Site 3

QUESTION 11

4 points Save Answer

Distillation is the separation of crude oil fractions, based on differences in their boiling points. Order the following fractions from the lowest boiling, to the highest boiling.

- Butane (C_4H_{10})
- Heptane (C_7H_{16})
- Kerosene ($C_{14}H_{30}$)
- Asphalt
- Lubricating Oils

A. > 500 °C
B. <30 °C
C. 30-180 °C
D. > 350 °C
E. 180-260 °C

QUESTION 12

4 points Save Answer

Your team has 3 sets of seismic data from 3 locations and has to decide which one to recommend for drilling.

Acoustic Impedance Z	Site 1	Site 2	Site 3
$Z_{top\ layer}$	4.4×10^6	6.9×10^6	2.3×10^6
$Z_{bottom\ layer}$	8.5×10^6	8.8×10^6	9.4×10^6

Write down the largest reflection coefficient *R*, to 2 decimal places, below.

QUESTION 13

4 points Save Answer

Epoxy matrix and metal fibres make up a composite material. Estimate the volume fraction of metal fibres required to make up a composite elastic modulus of 41 GPa. Take the elastic modulus of epoxy matrix to be 4.7 GPa, and the elastic modulus of

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Question Completion Status:

Click Save and Submit to save and submit. Click Save All Answers to save all answers.