

JET-2022 Chemical Sample Construct

- **Domain**

1. One of the advantages of solid fuel is _____

a) low calorific value	c) ash formation
b) requirement of excess air	d) ease of transport

2. One of the disadvantages of solid fuel is _____

a) clinker formation	c) storage
b) moderate ignition temperature	d) transportation

3. Crude oil is in the form of _____

a) emulsion of oil and brine	c) emulsion of brine and impurities
b) emulsion of oil and impurities	d) emulsion of impurities and moisture

4. To remove sulphur compounds from petroleum, it is treated with _____

a) copper nitrate	c) magnesium chloride
b) copper oxide	d) sodium chloride

5. $C_2H_4 + 1/2 O_2 \rightarrow C_2H_4O$ (Ethylene oxide). This reaction will take place under the presence of a catalyst. Find out the %atom economy.

a) 0.25	c) 0.75
b) 0.5	d) 1

6. In the petrochemical industry, both in the conventional method and green synthesis what is the first product obtained?

a) 2-ethyl benzene	c) Methyl methacrylate
b) Ethanol	d) 2-methyl propyl benzene

7. The quantity of water available for the actual use is _____

a) 0.1	c) 0.005
b) 0.05	d) 0.01

8. Lake water contains more _____ due to the biological oxidation of the organic matter.

a) Oxygen	c) Nitrogen
b) Carbon dioxide	d) Carbon monoxide

9. The low density polyethylene has a melting point.

a) 84OC	c) 86OC
b) 85OC	d) 87OC

10. Plasticized poly vinyl chloride can be used for _____

a) High-frequency insulator parts	c) Coated wires
b) Bottle caps	d) Electrical insulation

11. Compression moulding is applicable to _____

a) Thermoplastic resins	c) Both thermoplastic and thermosetting resins
b) Thermo setting resins	d) Neither thermoplastics nor thermosetting resins

12. Plastic resin is used in the paint industry as _____

a) Catalyst	c) Inhibitor
b) Ion exchanger	d) Coolant

13. Which of the following is the example of the syndiotactic polymers?

a) Polypropylene	c) Gutta-percha
b) Polyvinyl chloride	d) Polylactic acids

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14. Which of the following is used for making rechargeable batteries?
 - a) Polypyrene
 - b) Polyester
 - c) Polyaniline
 - d) Polyacrylonitrile
15. Bakelite is _____
 - a) Gel
 - b) Gas
 - c) Solid
 - d) Liquid
16. Most oil and gas reservoirs are found in which of the following formations?
 - a) Sandstone and Shale
 - b) Sandstone and Evaporites
 - c) Carbonate and Shale
 - d) Carbonate and Sandstone
17. For a spontaneous process, free energy
 - a) is zero
 - b) increases
 - c) decreases whereas the entropy increases
 - d) and entropy both decrease
18. For a stable phase at constant pressure and temperature, the fugacity of each component in a binary system _____ as its mole fraction increases.
 - a) decreases
 - b) increases
 - c) remains same
 - d) decreases linearly
19. Internal energy of an element at 1 ATM and 25° C is _____ kcal/kg. Mole.
 - a) 0
 - b) 273
 - c) 25
 - d) None of these
20. The value of Cp & Cv respectively for monoatomic gases in Kcal/kg Mole. °K are
 - a) 5 & 3
 - b) 3.987 & 1.987
 - c) 1.987 & 0.66
 - d) 0.66 & 1.987
21. Speisses is a mixture of the following:
 - a) Arsenides of heavy metals.
 - b) Antimonides of heavy metals.
 - c) Arsenides & antimonides of heavy metals.
 - d) Iron, cobalt, and nickel.
22. Autocollimator is used to check
 - a) flatness
 - b) angle
 - c) rotor balancing
 - d) roughness
23. A high temperature lubricants used may undergo _____
 - a) vulcanization
 - b) volatilization
 - c) lubrication
 - d) combustion
24. For heavy cutting, the effective lubricants are _____
 - a) coconut oils
 - b) cutting oils
 - c) kerosene
 - d) diesel
25. What are the lubricants used for railway tracks?
 - a) graphite
 - b) grease
 - c) coconut oil
 - d) vegetable oil
26. The lubricants for transformers must have the quality of good _____
 - a) dielectric strength
 - b) less oiliness
 - c) no resistance to oxygen
 - d) low load capacity
27. Which porosity should be high to be a good producing reservoir and contribute to fluid flow through its porous media?
 - a) Effective porosity
 - b) Absolute porosity
 - c) Primary porosity
 - d) Secondary porosity

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28. What will happen if we drill a salt dome?
- We'll get hydrocarbons
 - We'll get Water
 - It may collapse
 - Salt will be produced.
29. The compressibility factor of a gas is given by (where V_1 = actual volume of the gas V_2 = gas volume predicted by ideal gas law)
- V_1/V_2
 - V_2/V_1
 - $V_1 \cdot V_2$
 - $V_1 \times V_2$
30. If we increase the pressure on a substance (which is at its triple point), then the triple point
- increases
 - decreases
 - remains unchanged
 - may increase or decrease; depending on the substance
31. _____ equation predicts the activity co-efficient from experimental data.
- Lewis-Randall
 - Margules
 - Van Laar
 - both(b)&(c)
32. If the heat of solution of an ideal gas in a liquid is negative, then its solubility at a given partial pressure varies with the temperature as
- solubility increases as temperature increases.
 - solubility increases as temperature decreases.
 - solubility is independent of temperature.
solubility increases or decreases with temperature
 - depending on the Gibbs free energy change of solution.
33. Which of the following is the dynamic characteristics of an instrument?
- Reproducibility
 - Sensitivity
 - Dead zone
 - Fidelity
34. Typical specifications for design stipulates the gain margin and phase margin to be respectively
- > 1.7 and $> 30^\circ$
 - < 1.7 and $> 30^\circ$
 - < 1.7 and $< 30^\circ$
 - > 1.7 and $< 30^\circ$
35. Thermal conductivity measurement comprises the working principle of a
- CO₂ analyser
 - polarimeter
 - spectrometer
 - chromatograph
36. The function of a transducer is to
- modify the input signal.
 - amplify the input signal.
 - convert the primary signal into a more useful quantity, usually an electric impulse.
 - codify/decode the input signal.
37. Pick out the wrong statement.
- 'Reduced temperature' of a substance is the ratio of its existing temperature to its critical temperature, both expressed on a Celsius scale.
 - 'Reduced pressure' is the ratio of the existing pressure of a substance to its critical pressure.
 - 'Reduced volume' is the ratio of the existing molal volume of a substance to its critical molal volume.
 - none of these.
38. Vapor pressure of water at 100°C is about _____ bar.
- 0.1013
 - 1.013
 - 10.13
 - 101.3
39. A compound was found to have nitrogen and oxygen in the ratio 28 gm and 80 gm respectively. The formula of the compound is
- N₂O₄
 - N₂O₅
 - N₂O₃
 - none of these

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40. Measurement of the amount of dry gas collected over water from volume of moist gas is based on the
- | | |
|---------------------------------------|---------------------------|
| a) Charle's law. | c) Avogadro's hypothesis. |
| b) Dalton's law of partial pressures. | d) Boyle's law. |
41. Aerodynamic noise resulting from the turbulent gas flow is the most prevalent source of valve noise in fluid flow control. It is caused due to
- | | |
|---------------------|------------------------|
| a) Reynold stresses | c) both (a) & (b) |
| b) shear forces | d) neither (a) nor (b) |
42. Smoke is produced due to
- | | |
|--|--|
| a) insufficient supply of combustion air and insufficient time for combustion. | c) poor design & overloading of the furnace. |
| b) poor quality of fuel and improper mixing of fuel & combustion air. | d) all (a), (b) and (c). |

• **IoT**

43. In TQM, how many elements are there in Quality statements?
- | | |
|------|------|
| a) 1 | c) 3 |
| b) 2 | d) 4 |
44. KPI stands for?
- | | |
|------------------------------|--------------------------------|
| a) Knowledge Piece Indicator | c) Key Performance indicator |
| b) Key Potential Information | d) Knowledge Piece Information |
45. _____ algorithms enable the computers to learn from data, and even improve themselves, without being explicitly programmed.
- | | |
|---------------------|----------------------------|
| a) Deep Learning | c) Artificial Intelligence |
| b) Machine Learning | d) None of the above |
46. Boosting is an approach under:
- | | |
|------------------------|-------------------------|
| a) Regression | c) Classification |
| b) Ensemble Techniques | d) Association Analysis |
47. Which of the following is not a Social Media platform?
- | | |
|-------------|-------------|
| a) Amazon | c) Twitter |
| b) Facebook | d) LinkedIn |
48. One of the solutions we develop to present information for industry 4.0?
- | | |
|-------------------------|-------------------------|
| a) AutoPiQ | c) Cockpit |
| b) Availability Manager | d) Condition Monitoring |
49. What is/are the rules maintained by EPA?
- | | |
|--|--------------------------------------|
| a) Clean air maintenance | c) Reduction in noise decibel levels |
| b) Reduction of chemical effects in soil and river | d) Both(a) and (b) |
50. Which of the following is not part of smart factory?
- | | |
|-----------------------------------|--------------------------------|
| a) Machine condition monitoring | c) Machine failure forecasting |
| b) Machine performance prediction | d) Goods transportation |

Disclaimer: The sample paper is for illustrative purposes alone. The actual jet exam may contain different numbers of total questions or duration.