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COLLEGE OF ENGINEERING AND TECHNOLOGY
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Question Bank

Power Plant Instrumentation

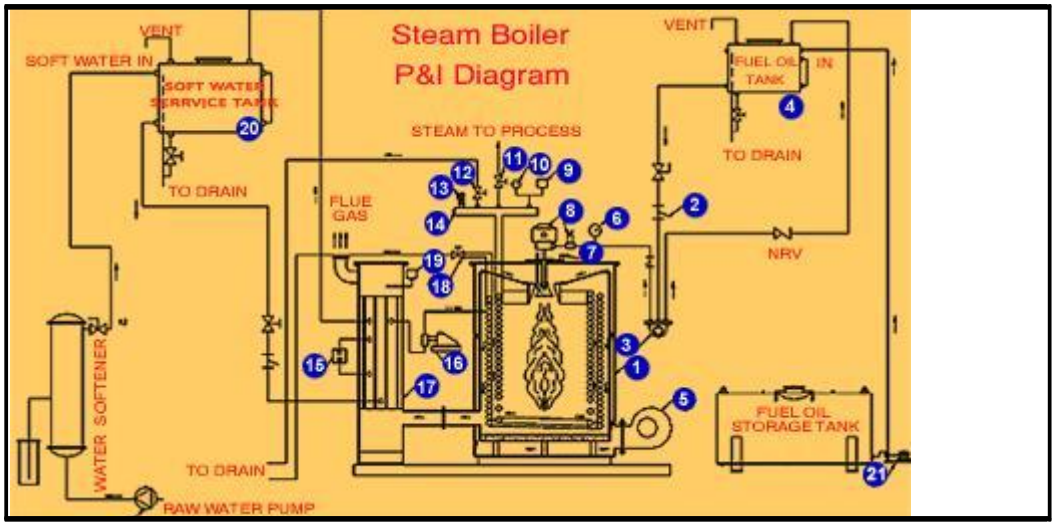
DEPARTMENT OF
ELECTRONICS AND INSTRUMENTATION ENGINEERING

1.Definition cogeneration:

A production of electricity and useful thermal energy simultaniously from a common fuel source. The rejected heat from industrial processes can be used to power an electric generator. Surplus heat from an electric generator can be used for industrial processes, or for heating purposes.

2.Sketch the P&I diagram of boiler.

HOT WATER GENERATOR P&I DIAGRAM



3. What is the advantage of Hydro power plant?

No pollution
No need of fuel

4. Advantage of thermal power plant.

1. The fuel used is quite cheap.
2. Less initial cost as compared to other generating plants.
3. It can beinstalled at any place iirespective of the existence of coal. The coal can be transported to the site of the plant by rail or road.
4. It require less space as compared to Hydro power plants.
5. Cost of generation is less than that of diesel power plants.

5. Disadvantage of thermal power plant.

1. It pollutes the atmosphere due to production of large amount of smoke and fumes.
2. It is costlier in running cost as compared to Hydro electric plants.

6. Why we can’t completely depend on solar and wind power plant?

It is fully depend on the natural.

7. What is the renewable source of energy?

   Water, solar, wind

8. What is the nonrenewable source of energy?

   Petroleum

   Coal

9. What are varies method of power generation?

   Thermal power plant

   Wind power plant

   Hydro power plant

10. What is meant by pulversing of coal?

    Crushing of coal and. during carbonization process

11. Give major building block of thermal power plant?

    Coal and ash handling

    Steam generation

12. Mention the use of conveyer?

    Transport the material from one place to other.

13. Water the pollution occurs due to thermal power plant?

    Water pollution

    Air pollution

14. Application of co generation.

    Efficiency Gains

    Moderate Temperature

    Saturated Steam

15. What are the fuels used in nuclear power plant?

    U-238

16. Define fusion.

Nuclear fission is the splitting of the nucleus of an atom into parts (lighter nuclei) often

producing free neutrons and other smaller nuclei, which may eventually produce photons (in the form of gamma rays). Fission of heavy elements is an exothermic reaction which can release large amounts of energy both as electromagnetic radiation and as kinetic energy of the fragments (heating the bulk material where fission takes place). Fission is a form of elemental transmutation because the resulting fragments are not the same element as the original atom.

17. Define Chain reactions.

Many heavy elements, such as uranium, thorium, and plutonium, undergo both spontaneous fission, a form of radioactive decay and *induced fission*, a form of nuclear reaction. Elemental isotopes that undergo induced fission when struck by a free neutron are called fissionable; isotopes that undergo fission when struck by a thermal, slow moving neutron are also called fissile. A few particularly fissile and readily obtainable isotopes (notably ^{235}U and ^{239}Pu) are called nuclear fuels because they can sustain a chain reaction and can be obtained in large enough quantities to be useful

18. Define nuclear reactor

nuclear reactor is a device in which nuclear chain reactions are initiated, controlled, and sustained at a steady rate, as opposed to a nuclear bomb, in which the chain reaction occurs in a fraction of a second and is uncontrolled causing an explosion

19. Define fission.

The splitting apart of an atom’s nucleus, releasing a large amount of heat energy.

20.Importance of instrumentation in thermal power plant.

Measure the variables to control

UNIT II

21. Define Humidity.
It is basically moisture content in air or it is the quantity of water vapour retained by gas.

22. Define Absolute Humidity.
Weight of water vapour in unit wait of gas.
H=Wr / Wg

23. Define Hygrometer.
Used to measure the moisture content in air. It also used to measure humidity.

24. What are the various methods of measurement of moisture.
Based on the weight of the particle
Based on the resistance, capacitance,

25. What are the different types of orifice?
Concentric orifice
Eccentric
Segmental

Quadrant edge

26. What are the disadvantages of pitot tube?
They can become plugged with sediment and that the pressure difference sensed may not belarge enough to give the desired accuracy for the flow rate under consideration.

27. define stagnation point.
Fluid approaching the object starts losing its velocity till directly in front of the body where the velocity is zero. This point is known as stagnation point.

28.define dall tube
It is an obstruction type primary element, used for fluid flow measurement. It produces large differential pressure with low pressure loss.

29. What are the different types of positive displacement meters?
Reciprocating piston type
Rotating vane type
Nutating disk type
Lobed impellar type
Oscillating piston type

30. List the disadvantages of reciprocating piston type
high cost
subject to leakage
problems created by dirty particle
high maintenance cost
restricted to moderate flow rates

31. Write any two points of calibration of flow meter
(i) wet meter- manometer which is calibrated with mercury
(ii) dry meter- manometer which is calibrated with mercury

32. list the advantage of oscillating piston type
good accuracy
can be easily applied to automatic liquid batching system
good repeatability
moderate cost

33. list the disadvantage of oscillating piston type
available in small size
suitable for clean fluids

34. what is the principle of densitometer
float density less than the fluid density, level increases float moves up, resistance connected
float varies, so output varies. Voltage output is proportional to the density of the fluid.

35. list the advantages of nutating disk type.
Less cost
Good accuracy
High temperature & pressure ratings

36. list the disadvantages of nutating disk type

Heavy accuracy decreases in increase flow rate

37. what is Rotameter?
It is an example of variable area flow meter. When fluid enters lopped moves from the bottom to top. Distance is proportional to the flow rate.

38. Explain the principle of calorimeter flow meter
consist of two coil type resistance thermometer, difference of temperature between the thermometer is maintained constant.

39. List some example of inferential flow meter.
Turbine flow meters
Target flow meters
Ultrasonic flow meters

40. list the advantages of electromagnetic flow meter?
It can handle slurries & corrosive fluids
It has low pressure drop
It can be used as bi-directional meter
Available in large pipe size & capacities

Unit III

41. 10.Specify the clssification of IR region of spectrum.
1.photographic region
2.very near IR region(overtone region)
3.near IR region(vibration rotation region)
4.far IR region(rotation region)

42.Name the instruments used in IR spectrometry.
1.IR radiation sources
2.monochromators
3.sample cells
4.detectors.

43.name few IR radiation sources.
1.incandescent source
2.nernst glower
3.globar source
4.mercury arc.

44. Give the advantages of grating monochromators
1.gratings can be made with materials like aluminium which are not affected by moisture.
2.grating monochromators can be used over wide wavelength ranges

45. Give 4 different techniques used for sampling of solids.
1.solids run in solution
2.solid film techniques
3.null techniques
4.pressed pellet technique

46. Name two different types of IR spectrometers

1.dispersive IR spectrometers
2.nondispersive IR spectrometers

46.. chromatography ,a short note.

Chromatography is defined as the physical and chemical method of seperation between various components of a mixture into pure fractions or bands of each component.

47.what are the different types of gas chromatography?

The different types of gas chromatography are æ_Gas liquid chromatograpry æ_Gas solid chromatography.

48.Define retention time

The time required for each of the components to emerge from sample or mixture is called as the retention time.

49.Name the different parts of gas chromatography?

Sample injection system
Chromatographic column
Thermostat
Detector
Recorder.

50.Explain the selection criteria for carrier gas.

The selection criteria for carrier gas are É_It should be very cheap É_It should have high thermal conductivity É_It should be inert É_The carrier gas should be selected according to the type of
detector used.

51. Explain chromatographic column.

The column acts as the heart of a gas chromatography, where the fundamental process of separation takes place. Its action is based on the fact that when a sample of gas or vapour is introduced into the column, it spreads by molecular diffusion to give a concentration profile.As the sample moves through the column, additional spreading takes place. But, the band maintains the general shape, which is detected and recorded as a chromatographic peak.

52.What is pyrolysis?

Pyrolysis is an accepted method of handling solid samples. It extends gas chromatographic analysis to compounds such as rubber , soil, textiles, coals, resins, polymers, paint films etc.
The method lends itself to studies on heat stability and thermal decomposition.
It is also called as controlled thermal fragmentation.

53.List some detectors in gas chromatography .

Thermal conductivity detector
Flame ionization detector
Thermionic emmision detector

Electron capture detector
Flame photometer detector
Photo ionization detector
Electrolytic conduction type of detection
Dual detector

54.Give the principle of Gas-Solid chromatography.
When a gas or vapour comes in contact with an adsorbent, certain amount of it get adsorbed on the solid surface.this takes place according to a phenomenon called Langmuir phenomenon given by
X/m = k1c+k2c
where k1,k2Æconstants
xÆmass of gas or vapour adsorbed
mÆ mass of adsorbent
cÆ vapour concentration in gas phase

55. .Give the principle of Gas-Liquid chromatography.
If the vapour or gas comes in contact with a liquid, a fixed amount of it gets dissolved in the liquid. This takes place according to Henry' slaw of partion given by
x /m =kc
where m Æ mass of liquid used
cÆvapour concentration in the gas phase
xÆ mass of gas
kÆconstant .

56.What are the advantages of gas chromatography?
The advantages of gas chromatography are
Good accuracy and precision
High sensitivity
Apparatus cost is cheaper than liquid chromatography
Shorter time of analysis
Longer life of the instrument.

57.Write the features of thermal conductivity detector . ô_It is simple, inexpensive, non-selective and non destructive and displays a
universal responce ô_Being non destructive ,the column effulent can be passed through a TCD and
then into a second detector ô_The sensitivity is 0.3 ng/ml . The linearty is between 104 to 105 ô_It is particularly suitable for fraction correction and preparative gas chromatography .

58.On what factor does the choice of detector will depend on liquid chromatography?
Good sensitivity
Better selectivity
The detector must be able to operate in the presence of background signal
The response time of the detector must be compactible with chromatography

59.What are the limitations of bulk property detector?
Limitations :
It is insensitive
It requires good temperature control.

60. What are the different typesof liquid chromatography?
The different typesof liquid chromatography are É_Liquid-liquid chromatography É_Liquid-solid chromatography É_Ion exchange chromatography or Bonded phase chromatography É_Exclusion chromatography

UNIT IV

61.What are the two segments of Nyquist contour.

i. An finite line segment C1 along the imaginary axis.
ii. An arc C2 of infinite radius.

62.What are root loci.

The path taken by the roots of the open loop transfer function when the loop gain is varied from 0 to α are called root loci.

63.What is a dominant pole.

The dominant pole is a air of complex conjugate pair which decides the transient response of the system.

64.What are the main significances of root locus.

i. The main root locus technique is used for stability analysis.
ii. Using root locus technique the range of values of K, for as table system can be determined

65.What are the effect of adding a zero to a system.

Adding a zero to a system increases peak overshoot appreciably.

66.What are N circles.

If the phase of closed loop transfer function with unity feedback is α, then tan α will be in the form of circles for every value of α. These circles are called N circles.

67.What is control system?

A system consists of a number of components connected together to perform a specific function . In a system when the output quantity is controlled by varying the input quantity then the system is called control system.

68.What are the two major types of control system?

the two major types of control system are open loop and closed loop

69.Define open loop control system.

The control system in which the output quantity has no effect upon the input quantity are called open loop control system. This means that the output is not feedback to the input for correction.

70.Define closed loop control system.

The control system in which the output has an effect upon the input quantity so as to maintain the desired output value are called closed loop control system.

71.What are the components of feedback control system?

The components of feedback control system are plant , feedback path elements, error detector and controller.

72.Define transfer function.

The T.F of a system is defined as the ratio of the laplace transform of output to laplace transform of input with zero initial conditions.

73.What are the basic elements used for modeling mechanical translational system.

Mass, spring and dashpot

74.What are the basic elements used for modeling mechanical rotational system?

Moment of inertia J,fdashpo with rotational frictional coefficient B and torsional spring with stiffness K

75.Name two types of electrical analogous for mechanical system.

The two types of analogies for the mechanical system are

Force voltage and force current analogy

76.What is block diagram?

A block diagram of a system is a pictorial representation of the functions performed by each component of the system and shows the flow of signals.The basic elements of block diagram arew block, branch point and summing point.

77.Distinguish between open loop and closed loop system

Open loop	Closed loop
1.Innaccurate	Accurate
2.Simple and economical	Complex and costlier
3.The changes in output due to external disturbance are not corrected	The changes in output due to external disturbances are corrected automatically
4.They are generally stable	Great efforts are needed to design a stable

78.What is servomechanism?

The servomechanism is a feedback control system in which th output is mechanical position (or time derivatives of position velocity and acceleration,)

79.What is an order of a system.
The order of asystem is the order of the differential equation governing the system.The order of the system can be obtained from the transfer function of the given system.

80.Define Damping ratio.
Damping ratio is defined as the ratio of actual damping to critical damping.

UNIT V

81. Define Delay time.
The time taken for response to reach 50% of final value for the very first time is delay time.

82. What is the principle of manometer?

The manometer is the simplest measuring instrument used for measuring low pressure ranges by balancing the pressure against the weight of a column of liquid. The action of all manometers depends on the effect of pressure exerted by a fluid at a depth.

83. Write some applications of pressure measurements.

Pressure measurement helps in determining the liquid level in tanks and containers.

Pressure measurement helps in determining the density of liquids.

Used in many flow meters. Eg. Venturi meter, Orifice meter etc.,

Pressure measurement is also required in day-to-day situations such as maintaining optimal pressure in tubes of vehicles tyres.

84. What is bellows element?

The bellows element is cylindrical in shape and the wall of this cylinder is thin and corrugated. The wall of this bellow is about 0.1mm thick and is made of some springy material such as stainless steel, brass or phosphor bronze. This bellows element is open at one end to receive the applied pressure and is closed at its other end. This other end is usually attached with a rod. In many cases a spring is placed inside the bellows to regain its original shape when the applied pressure is relieved.

85. Define. Ionization

Ionization is the process of knocking off an electron from an atom and thus producing a free electron and a positively charged ion.

86. What is dead weight tester?

The laboratory standard of pressure is a dead weight tester and it is very often used to calibrate Bourdon gauges.

87. Give the shapes of bourdon tubes available?

C-shape
Helical shape
Spiral shape

90. What are the errors present in manometer?

Effect of temperature
Capillary effect
Effect of variable meniscus

91. What are the fluids used for manometers?

The most common fluids used in manometers are water, red oil, and mercury. To minimize the effects of freezing and evaporation, kerosene or anti-freeze may be used.

92. What is the principle of operation of an ionization gauge?

It follows Boyle's law, which is at constant temperature, the ratio of pressure of two gauges is equal to the ratio of two densities.

93. On what factors the deflection of bellows depends?

Bellows are the substitutes for multi stack diaphragms. The flexibility of bellows is directly proportional to,

Number of convolutions
Square of the outside diameter of the Bellows

Inversely proportional to,

The cube of the wall thickness
The Young's modulus of elasticity

94. Mention some temperature sensor.

Thermocouple
Thermistors
RTD

95. Define speed.

Speed is defined as distance traveled by a body in unit time.

95. Name the speed measuring device.

Tachometer

96. List the direct level measuring methods.

Float type level indicator
Displacer type detector
Sight glass type.

97) List the indirect level measuring methods.
Hydrostatic measurement
Air purge system
Boiler drum system.

98) What are the advantages of sight glass level instrument?
Direct reading is possible.
Special designs are available.
Glass less devices are available in numerous material for corrosion resistance.

99) What are the advantages of displacer level instrument?
High accuracy
Reliable to clean liquids

100. What is micro manometer?

A micro manometer is used for the accurate measurement of extremely small pressure differences.

101. What is the principle of McLeod gauge?

McLeod gauge operates by taking in a sample volume of gas from a vacuum chamber, and then compressing it by tilting, and infilling with mercury. The pressure in this smaller volume is then measured by a mercury manometer, and then knowing the compression ratio, the pressure of the original vacuum can be determined.

102. Give the types of thermal conductivity gauges.

Pirani gauge
Thermocouple type conductivity gauge
Ionization gauge

103. Give the advantages pressure measurement using bellows.

Simple and rugged construction
Moderate cost
It is useful for low, medium and high pressure measurement
Their applicability for use in measurement of absolute, gauge and differential pressures

UNIT IV

DCS

1. What is the significance of DCS?

Used for interfacing and computing functions and also provides the means of communication between the other devices. It consists of local control unit, low level interface, high level interface, shared communication facility. Etc

2. Mention any two advantages of DCS

•more reliable

•small expensive

•cost is lower than centralized system which performs the same function.

3. What is LCU?

Local control unit is the small collection of hard ware in the system that can do closed loop control. Local control unit interfaces directly to the process.

4. What is the significance of LLHI?

This is the device that allows the operator or instrumentation engineer to interact with the LCU to change set point, control modes, control configuration, or tuning using a direct connection. LLHI can also interface directly to the process.

5. What is the function of HLOI?

It has the functions similar to the LLHI with increased capacity and user with increased capability and user friendliness. It interfaces to other devices only over the shared communication facilities. Operator oriented program at this level is called HLOI. It is an instrument engineer oriented program.

6. What is shared communication?

One or more communication hardware and associated software that allow the sharing of data among all devices in the distributed system. Shared communication facilities do not include dedicated communication channels between specific devices.

7. What is the need can be satisfied in designing an industrial grade LCU?

•flexibility of changing the control configuration

•Ability to use the controller without being a computer expert.

•Ability to by pass the controller in case it fails. So that the process still can be controlled manually.

•Ability of the LCU to communicate with other LCUs and other elements in system.

8. What is the architecture parameter to be considered while selecting LCU?

•size of controller

•functionality of controller

•performance of controller

•communication channels out of controller

•Controller output security.

9. Compare the configuration of the controller

Architecture parameter	Configuration A	Configuration B	Configuration C
Controller size	Number of function needed for single PID loop or motor controller	Includes functions and I/O	Equivalent to small DDC system
Controller functionality	Uses both continues and logic function	Uses both continues and logic function Split between the controller	Uses both continues and logic function
Controller scalability	High degree of scalability	Requires both controller types	Not scalability

10. What are the security requirements of LCU?

• Maximize the availability of the automatic control functions of the system.

•During failure of the controller allows the operator to take the manual control of that process?

•Operator can shut the process down in an orderly and safe manner.

11. Write objectives of DCS.

1. Safe operation of plant
2. Lowest cost of operation
3. Longest equipment life
4. Minimum environment effect
5. Maximum efficiency

12. What is distributed system?

A distributed system is one in which components located at networked computers communicate and coordinate their actions only by passing messages.

13. What is DCS?

A distributed control system (DCS) refers to a control system usually of a manufacturing system, process or any kind of dynamic system, in which the controller elements are not central in location (like the brain) but are distributed throughout the system with each

component sub-system controlled by one or more controllers. The entire system of controllers is connected by networks for communication and monitoring.

14. Write benefits of DCS?

High reliability – reduce human error

Improved response time

– allowing easier identification of bottle-necks

Improve operator interface to plant

– better production scheduling, making maximum use of the production facilities

Improve accessibility of plant data to engineering & management personals

- Faster identification of faults in both product and processing machinery

Historical storage & retrieval system.

15. Write DCS elements1.

Local Control Unit: This unit can handle 8 to 16 individual PID loops.

Data Acquisition Unit: Digital (discrete) and analog I/O can be handle.

Batch Sequencing Unit: This unit controls a timing counters, arbitrary function generators, and internal logic.

Local Display: This device provides analog display stations, and video display for readout.

Bulk Memory Unit: This unit is used to store and recall process data.

16. Write DCS elements2.

General Purpose Computer*:* This unit is programmed by a customer or third party to perform optimization, advance control, expert system, etc

Central Operator Display: This unit typically contains several consoles for operator communication with the system, and multiple video color graphics display units

Data Highway*:* A serial digital data transmission link connecting all other components in the system. It allow for redundant data highway to reduce the risk of data loss

Local area Network *(LAN*

17. What are the Advantages of DCS?

- Access a large amount of current information from the data highway.
- Monitoring trends of past process conditions.
- Readily install new on-line measurements together with local computers.
- Alternate quickly among standard control strategies and readjust controller parameters in software.

➢ A sight full engineer can use the flexibility of the framework to implement his latest controller design ideas on the host computer.

18. List the Modes of Computer control.

1. Manual
2. Automatic
- PID with local set point
3. Supervisory
- PID with remote set point (supervisory)
4. Advanced

19. What are the two methods that control the flow of data across communication links?

1) Stop and wait 2) sliding window

20. What is the mechanism of stop-and-wait flow control?

In the stop and wait method of flow control sender sends one frame and waits for an acknowledgement before sending the next frame.

21. What is the mechanism of sliding window flow control?

In the sliding window flow control; the sending of data is constrained by imaginary window that expands and contracts according to the acknowledgement received by the sender.

22. What does the term error control mean in the data link layer?

Error control in the data link layer is based on the automatic repeat request which means retransmission of data in three cases: damaged frame lost frame, lost acknowledgment.

23. What is the mechanism of poll/select?

A poll is sent to the secondary device by the primary to determine if the secondary has to send. The secondary can respond by sending a acknowledgement or a data frame. A select frame is sent from the primary device to the secondary device to tell the secondary to prepare to receive data. The secondary responds with an ACK or a NAK

24. Define protocol.

A protocol in data communications is the set of rules or specifications used to implement one or more layers of the OSI model.

25. What are the two types of data link protocol?

1).Asynchronous protocol 2).Synchronous protocol

1. What is manual backup?

In this case, each LCU is designed to implemented only one or two control loops , and reliable is placed on the operator to take over manual control in case of a failure of LCU.

2. What is redundant control mode?

In this case, the LCU is backed up by another LCU that takes over if the primary controller fails. In this way, full automatic control is maintained even under failure conditions.

3. What are the approaches in designing a redundant LCU architecture?

a) CPU redundancy,

b) One-on-one redundancy,

c) One-on-many redundancy,

d) Multiple active redundancy.

4. What is meant by geographically centralized and geographically distributed control system?

All the LCUs are located in a central equipment room area; it is called as geographically centralized control system. Each LCU is located in the plant area closest to the portion of the process that it controls. It is called as geographically distributed control system.

5. What is functionally distributed control system?

Several LCUs are used to implement the functions required in controlling the process. Therefore it is called as functionally distributed control system.

6. What are multiple active controllers?

In this case, several LCUs are active at the same time in reading process inputs calculating control algorithms and producing control outputs to the process. The multiple active approaches is designed so that a failure of one of the controllers does affect the automatic control function.

7. What are the redundant approaches of redundant controllers?

The redundant architecture should be kept as simple as possible. There is a law of diminishing in redundancy design. At some point, adding more hardware will reduce system reliability. The redundant nature of the controller configuration should be transparent to the user that is the user should be able to deal with the system in the way as a non redundant one.

8. Mention the requirement of operator interface

•process monitoring

•process control

•process record keeping

9. What are the motivations for using LLOI?

•It provides an interface that is familiar to the operator trying to use panel board instrumentation.

•Less expensive

•Provide manual back up in the case if high level operator interface fails.

10. Explain about different types of operator display.

•Plant display.

•Area display.

•Group display.

•Lop display.

•Graphic display.

•Trend display.

•Tabular display.

11. What is the function of engineering interface?

•system configuration

•operator configuration

•system documentation

•system failure diagnosis

12. What is data transparency?

Data transparency in data communication means we should be able to send any combination of bits as data. The combination of bits as data is not confused with the control information.

13. Define BSC.

Binary synchronous communication is a well-known character oriented protocol .BSC operates in half-duplex mode using stop and wait ARQ in a point to –point or multipoint configuration.

14. What is bit stuffing?

Bit stuffing is the process of adding one extra '0' whenever there are five consecutive '1's in the data. So that the receiver doesn't mistake the data for a flag.

15. What do you mean by HDLC?

High-level data link control is a bit oriented data link designed to support both half-duplex and full-duplex communication over point-to point and multi point links.

16. How do the three HDLC frame types differ from one another?

a)I-frame -for data transmission and control

b)S-frame-control

c)U-frame –for control and management

17. What are the types of modes in HDLC?

a) Normal response mode (NRM)

b) Asynchronous response mode (ARM)

c) Asynchronous balanced mode (ABM)

18. What is piggy bagging?

Piggy backing means combining data to be sent and acknowledgement of the frame received in one single frame.

19. Name the four types of s-frames?

a) Receive ready(RR)

b) Receive not ready (RNR)

c) Reject (REJ)

d) Selective reject (SREJ)

20. Name the five categories of U-frame.

1) Mode setting

2) Unnumbered exchanging

3) Disconnection

4) Initiation

5) Miscellaneous

21. What are the types of sliding window ARQ error control?

1) go-back-n 2) Selective –reject

22.Distinguish X-modem and Y-modem?

X-modem	Y-modem
1.the data is 128bytes 2one CANS signal is used to abort a transmission 3.CRC error checking is	1.the data unit is 1024bytes 2.two CAN signals are used 3.ITU-T CRC is used for error checking

used 4.It is a half-duplex stop and wait ARQ protocol	4.here multiple files can be sent simultaneously

23. What are the disadvantages of asynchronous transmission?

1).speed of transmission is less

2)It leaves unpredictable gaps of time between each character

3).the addition of start and stop bits and the insertion of gaps into the bit stream make asynchronous transmission slower.

24. What are the two types of synchronous protocol and explain it?

1) Character oriented protocol

2) bit-oriented protocol

25. What is routing table?

A routing table has columns for at least three types of information: the network ID and ID of the next router. The network ID is the final destination of the packet. The cost is the number of hops a packet must make packet to get there. And the next router is the router is the router to which a packet must be delivered on its way to a particular destination.

1. What are the factors to be considered during the design of a nuclear power reactor?
2. What are the functions economizer and super heater in thermal power plants?
3. Under what circumstances the frequency of the power supply gets reduced?
4. What is the necessity for measuring concentration of O_2 in feed water?
5. What is meant by interlocks in boiler operation?
6. Write any four impurities in the feed water.
7. Mention different control loops in boilers.
8. Explain the term ratio control.
9. What is role of deaerator in the thermal power plant?
10. Write any four electrical & non electrical measurements in power plants.
11. Suggest two sensors each for the measurement of steam pressure and steam temperature.
12. Draw the some of the P&I diagram symbols used in power plants.
13. Compare renewable and nonrenewable power plants.
14. What is the importance of instrumentation in power generation?
15. Compare feed back and feed forward control loops
16. Why pollution monitoring instruments are necessary in power plants?
17. What is meant by furnace draft?
18. Suggest two sensors for the measurement of steam pressure and steam temperature.
19. Why lubricant oil is needed in turbines,
20. Why is it necessary to keep the pH of feedwater within a specified range?
21. What is meant by attemperator
22. Mention the methods of controlling the temperature in super heaters,
23. Mention the functions of condensers.
24. List the types of LCU in DCS.
25. What is the significance of DCS?
26. Compare the configuration of the LCU?
27. What is redundant control mode?

1. Discuss in detail about the importance of instrumentation in power generation.
2. Explain how the electrical instruments are chosen for the measurement of current, voltage and power in a 20MW thermal power plant.
3. With necessary diagrams explain the construction and operation of thermal power plants with operations.
4. With neat sketch explain the building blocks of a thermal power plant with boiler accessories.
5. Explain in detail about co generation.
6. Write short notes on
    i. Solar power plants.
    ii. Hydro power plants.
7. Describe the method of measuring the water level in the boiler drum.
8. Describe the working of an instrument used for the measurement of smoke density.
9. Explain in detail about Pollution monitoring instruments in power plants.
10. Write short notes on Flue gas oxygen analyzers in power plants
11. Explain in detail about the dissolved oxygen analyzer with suitable diagrams.
    Write short notes on
    i. pH meters.
    ii. Deaerator control.
12. Explain in detail about air-fuel ratio & drum level control loops in boiler.
13. Describe in detail about the following control loops in boiler
    i. Combustion control.
    ii. Furnace draft control.
14. Write short notes on Steam temperature control in power plants
15. Describe the method of measuring the water level in the boiler drum.
16. Explain in detail about the dissolved oxygen analyzer with suitable diagrams
17. Describe in detail about the following control loops in boiler
    i. Feed water control.
    ii. Drum Level control
18. With neat sketch explain the Speed, vibration & shell temperature monitoring in turbines.
19. Describe in detail about the following control loops in boiler
    i. Steam pressure control
    ii. Lubricant oil temperature control

20. Write short notes on
    i. speed control.
    ii. Steam temperature control

21. Explain in detail about the lubrication system in thermal power plants with suitable diagrams.
22. Explain in detail about the cooling system in thermal power plants with suitable diagrams.
23. Explain in detail about the condensers in thermal power plants with suitable diagrams.
24. Write short notes on high level engineering interfaces in DCS.
25. Write short notes on low level operator interfaces in DCS.
26. Write short notes on low level engineering interfaces in DCS.
27. Write short notes on high level operator interfaces in DCS.
28. Explain in detail about different architectures of DCS with comparison.
29. Write short notes on engineering interfaces and operator interfaces in DCS.
30. Explain in detail about the different types operator displays in DCS with diagrams.
31. Explain in detail about the implementation of DCS in power plants.
32. With neat sketch explain about the boiling water reactor (BWR)
33. With neat sketch explain about the pressurised water reactor (PWR)
34. With neat sketch explain about the sodium cooled.
35. With neat sketch explain about the organic liquid reactor.
36. With neat sketch explain about the nuclear radiation measurement.
37. With neat sketch explain about the instrumentation in nuclear reactor.
38. With neat sketch explain about the P&I diagram of nuclear power plant.