	AkhilBharatiya Maratha ShikshanParishad's **Anantrao Pawar College of Engineering & Research**	
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Internal Correspondence For Department

SUBJECT NAME - Soldering & De-soldering components & Emergency actions

SEMESTER -1ST (First year)

Subject in charge- Prof. Mehtre V K

Exam pattern- Insem &Endsem

Syllabus-

INTRODUCTION TO SMD COMPONENTS

- Identification of 2, 3, 4 terminal SMD components

-Soldering the SMD components on the PCB

-Make the necessary settings on SMD soldering station to solder various ICs of different

-packages by choosing proper clamping tools

- Identify various connections and the setup required for SMD soldering station

-De solder the SMD components from the given PCB

-Make the necessary settings on SMD soldering station to de solder various ICs of different

- packages by choosing proper clamping tools

-Make a panel board using different types of switches for a given application

- Identification of crimping tools for various IC packages, Reliable Soldering Practices

EMERGENCY ACTIONS

-Minimum Requirements, -Reporting Emergencies , -Emergency exits,

- Primary and secondary evacuation routes -Locations of fire extinguishers,

-Fire alarm pull stations' location, -Assembly point , - Medical

Question Answer

1)How do I identify an SMD component?

Ans- SMD components are typically identified by a standardized code system, which consists of alphanumeric characters. This code system varies depending on the type of component, such as resistors, capacitors, or inductors

2) How to identify SMD size?

Ans- In this system, SMD component size is represented by a three-digit number, with the first two digits representing the width and the last digit representing the height. For example, a 0201 SMD component would be 0.02 inches wide and 0.01 inches tall

3) What is SMD analysis?

Ans- The standardized mean difference is used as a summary statistic in meta-analysis when the studies all assess the same outcome but measure it in a variety of ways (for example, all studies measure depression but they use different psychometric scales).

4) What is the full form of SMD tester?

Ans- The Tester is a handheld and battery operated very convenient small Tool that is specially used to measuring SMD (Surface Mounting Device), there arechip type resistor, chip type capacitor and diode, for example.

5) What is SMD codes?

Ans- The 3-digit SMD (Surface Mount Device) code is a system used to identify surface mount semiconductor devices. It typically consists of three digits followed by an optional letter suffix.

6) What is the full form of ESD in SMD?

Ans- Electrostatic Discharge (ESD) is the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown.

7) How to calculate SMD resistor?

Ans- First, take the first two numbers such that our SMD resistor's base resistance is 81. From this, we must recalculate our final number as our "power" of ten. We must now multiply 81 by 10 to the power of three. We may calculate that the real resistance of the resistor is 81,000000 Ohms or 81M Ohms.

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8) What is the difference between THT and SMT?

Ans- The SMT process involves soldering components into their required locations directly on the board's substrate. However, through-hole technology (THT) involves passing the conductive 'legs' – fine wire leads – of your components through small apertures that have been machined into the substrate at specific points

9) What type of PCB is SMT?

Ans- The assembly is soldered by reflow and/or wave soldering processes depending on the mix of surface mount and through-hole mount components. When attached to PCBs, both active and passive SMCs form three major types of SMT assemblies, commonly referred to as Type 1, Type II, and Type III

10) How will you desolder a component from PCB?

Ans- Heat is applied to the solder joint causing the solder to melt and become fluid once more. This solder is then pulled away from the PCB, freeing the component. There are 2 main ways in which you can desolder. One is by using a soldering iron, and the other is by using a hot air station.

11) How to remove solder without heat?

Ans- If you want to clean solder off a circuit board without using heat, using a compressed air machine is your best alternative. The compressed air inside the can will merely blast the solder away from the circuit board using its high pressure

12) Do I need flux to desolder?

Ans- Flux aids in soldering and desoldering processes by removing oxide films which form on the surface of metals being soldered. It increases the wetting ability of the solder, causing it to flow more uniformly over surfaces without balling-up (dewetting)

13) Which side of PCB is correct for soldering?

Ans- The bottom side of the PCB is usually the side without components and the side that touches the solder wave during assembly. That is why sometimes it is also called SOLDER side.

14) What chemical is used to remove solder?

Ans- Aqua regia (a mixture of concentrated nitric and hydrochloric acids) will also dissolve the gold. It will definitely dissolve solder

15) What are 3 methods of removing solder off of a PCB?

1.Method 1 - Using the Desoldering Pump.

2.Method 2 - Using a Desoldering Braid.

3.Method 3 - Using the other tools.

16. How to do soldering and desoldering?

Ans- You're going to heat the solder pad and the component lead very hot for 2 to 3 seconds. The pad and lead should readily melt the solder wire. Press the tip against the circuit board's solder pad and the component lead for about 1 second to heat them both. Angle the tip so it has maximum contact with the pad and lead.

17. What are the 7 steps of soldering?

Step 1: Solder. For Simple Bots, the ideal solder is . ...

Step 2: Turn It On. Before any soldering can be done, the soldering iron needs to be turned on and heated to the desired temperature. ...

Step 3: Picking It Up. ...

Step 4: Putting It Down. ...

Step 5: Tin the Tip. ...

Step 6: Strip Wires. ...

Step 7: Twist. ...

Step 8: Solder.

18. What is the use of desoldering?

Ans- Desoldering may be required to replace a defective component, to alter an existing circuit, or to salvage components for re-use. Use of too high a temperature or heating for too long may damage components or destroy the bond between a printed circuit trace and the board substrate.

19. What are the disadvantages of desoldering?

Ans- Some advantages of using a desoldering pump are that it is fast, easy, and cheap. However, some disadvantages are that it can damage the board or the component if not used carefully, it can leave some solder residue, and it can clog up over time.

20. How to solder correctly?

Ans- **To solder, heat the connection with the tip of the soldering iron for a few seconds, then apply the solder.**

1. Heat the connection, not the solder.
2. Hold the soldering iron like a pen, near the base of the handle.
3. Both parts that are being soldered have to be hot to form a good connection.

21). What are common mistakes soldering?

Choosing the Wrong Products. ...
Skipping the Prep. ...
Applying Too Much Flux. ...
Overheating the Joint. ...
Neglecting the Cleanup.

22) What is the best technique for soldering?

Ans- Make sure your soldering iron is fully heated and touch the tip to the end of one of the wires. Hold it on the wire for 3-4 seconds. Keep the iron in place and touch the solder to the wire until it's fully coated. Repeat this process on the other wire.

MCQ ON RAC

1)What is Refrigeration?
a) Refrigeration is the process of removing heat from a substance and cooling it to a temperature or below the actual temperature
b) Refrigeration is the process of adding heat from a substance and cooling it to a temperature
c) Refrigeration is used to increase the level of humidity in the air by adding heat
d) None of the mentioned

2) How is the refrigerant used in the Air refrigeration cycle?
a**) In the compressor** b) In the condenser
c) Directly in contact d) Not used at all

3) Which of the following refers to the term C.O.P. of refrigeration?
a) Cooling for Performance **b) Coefficient of Performance**
c) Capacity of Performance d) Co-efficient of Plant

4) Which of the following is NOT the advantages of using a closed Air Refrigeration system?
a) Compact in construction **b) Lower coefficient of performance**
c) Lighter in weight d) Environmental Friendly

5) In lithium bromide absorption refrigeration system it is not necessary to keep the refrigeration temperature above 0°C.
a) False b) True

6) Which of the following is the S.I. unit to measure pressure in refrigeration?
a) Bar b) Newton c) Joule **d) Pascal**

7) Which of the following is the main disadvantage of natural refrigeration methods?
a) natural refrigeration methods are dependent on local conditions
b) natural refrigeration methods are not environment friendly
c) natural refrigeration methods are expensive
d) natural refrigeration methods are poisonous

8) Which of the following is the result of a reduction in operating pressure in the Air refrigeration cycle?
a) decrease in C.O.P.= b) always decreases **c) increase in C.O.P.** d) no change in C.O.P.

9) Which of the following is the key difference between a simple VAR and Electrolux refrigerator?
a) Working mechanism b) Generator c) Absorber **d) Liquid pump**

10. Efficiency of the Refrigerator is _____ to the C.O.P of the refrigerator.
a) independent b) directly proportional c) inversely proportional d) equal

11. Which of the following will be the value of Refrigeration effect if m_2 = 2 kg/min, m_3 = 0.8 kg/min and enthalpies for the refrigerant at saturated vapor and saturated liquid line are 1420 and 1260 kJ/kg?
a) 129 b) 196 c) 194 **d) 192**

12. Which of the following of the refrigerant is used as a refrigerant in Lithium Bromide Absorption Refrigeration system?
a) Lithium Bromide b) Hydrogen **c) Water** d) Ammonia

13. Which of the following refrigerants are used in Electrolux and Li-Br water refrigeration system?
a) Water and Bromide **b) Ammonia and Water** c) Ammonia and Lithium

d) Water and Water

14. Which of the following will be the value of Refrigeration effect if m_1 = 4 kg/min, and enthalpies for the point 1, 2, 4, 5, 9 are 1350, 1550, 1480, 1620, and 280 kJ/kg. If the refrigeration effect is 4280 kJ/min and work done is 15 kW, then what is the value of C.O.P.?
a) 4.75 b) 6.00 c) 5.50 d) 4.85

15. Which of the following is the common application of Air standard refrigeration system?
a) Cold storage
b) Car air conditioning system
c) Domestic refrigerators
d) Aircraft air conditioning

16. What is Air Conditioning?
a) Air Conditioning is the process of adding heat and increasing the humidity
closed

b) Air Conditioning is the process of removing heat and controlling the humidity of air in a space
c) Air conditioning is the process of controlling air moisture in an open area by adding heat
d) None of the mentioned

17. Which of the following process is used in winter air conditioning?
a) Cooling and Dehumidification
b) Heating and Humidification
c) Dehumidification
d) Humidification

18. On which of the following cycle the air conditioning systems are based in transport aviation?
a) Reversed Joule's cycle
b) Otto cycle
c) Reversed Carnot cycle
d) Reversed Brayton cycle

19. Which of the following process is used in summer air conditioning?
a) Heating and Humidification
b) Cooling and Dehumidification
c) Humidification
d) Dehumidification

20. If the Coefficient of performance of a heat pump is 5, then what is the value of the Coefficient of performance of the refrigerator operating under the same conditions?
a) 0.2
b) 3
c) 4
d) 6

21. How is the cascade system achieved?
a) VCR system in a parallel combination
b) VCR system in a series combination
c) VAR system in a series combination
d) VAR system in a parallel combination

22. Dense air Bell-Coleman refrigerator is preferred over open cycle air refrigerator.
a) False
b) True

23. In which of the following Capillary tube is used in as an expansion device?
a) Room air conditioners
b) Water coolers
c) Domestic refrigerators
d) All of the mentioned

24. Which of the following uses natural convection air-cooled condensers?
a) High capacity room air conditioners
b) Industrial air conditioners
c) Domestic refrigerators
d) High capacity water coolers

25. Which of the following is the material of tubes used for shell and tube condenser in ammonia **refrigeration** system?
a) Copper

b) Steel
c) Brass
d) Aluminum

26. Which of the following represents sensible cooling on the psychrometric chart?
a) Inclined line
b) Curve
c) Horizontal line
d) Vertical line

27. Which of the following is the major equipment in the simplest form is used to do saturation of air?
a) Pipe
b) Chamber
c) Vessel
d) Insulated Chamber

28. Why is the evaporator used?
a) To absorb heat
b) To decrease the refrigeration effect
c) To reject heat
d) To improve C.O.P.

29. Which of the following refrigerants is having the lowest C.O.P for refrigeration system working under the temperature limits of -15°C and 30°C as evaporator and condenser temperature respectively?
a) R – 12
b) Carbon dioxide
c) Ammonia
d) R – 30

30. Which of the following type of refrigerants take a direct part in the refrigeration system?
a) Primary
b) Secondary
c) Tertiary
d) Mixed

31). The temperature of the dry bulb _____ during the process of heating and dehumidification.

a. Increases

b. Decreases

c. Remains Constant

d. Cannot be Determined

32. A typical refrigeration cycle would operate between a +27°C condenser temperature and a -23°C evaporator temperature. Here, what would be the performance of the cycle's Carnot coefficient?

a. 6

b. 5

c. 1.2

d. 0.2

33). Which of these increases during the process of humidification?

a. Specific humidity

b. Dry bulb temperature

c. Relative humidity

d. Wet-bulb temperature

34). What does a vapour absorption refrigerator use in the form of a refrigerant?

a. Aqua-ammonia

b. Freon

c. Ammonia

d. Water

35). One ton of refrigeration in the S.J. unit is:

a. 840 kJ/min b. 420 kJ/unit c. 21 kJ/unit **d. 210 kJ/unit**

36). At a domestic refrigerator's back, the bank of tubes is known as:

a. Evaporator tubes **b. Condenser tubes** c. Capillary tubes d. Refrigerant cooling tubes

37). The expansion device, in any refrigeration system, is connected between:

a. Receiver and Condenser b. Compressor and Condenser

c. Compressor and Evaporator **d. Evaporator and Receiver**

38). What do we call the ratio of the actual mass of water present in an available volume of moist air to the total amount of water vapour present in the very same amount of saturated air present in the same pressure and temperature?

a. Degree of saturation b. Absolute humidity **c. Relative humidity** d. Humidity ratio

39). Which of these refrigerants is highly flammable and toxic?

a. R-12 b. Sulphur dioxide c. Carbon dioxide **d. Ammonia**

40). During the process of sensible heating of air, the wet-bulb temperature would be:

a. Decreases

b. Remains Constant

c. Increases

d. None of the above

41). What is the mixture of water vapour called when the maximum amount of water vapour has been diffused in the air?

a. Specific humidity **b. Saturated air** c. Moist air d. Dry air

42). In a vapour compression cycle, where do we find the lowest temperature?

a. Evaporator b. Condenser c. Expansion Valve d. Compressor

43). What is the pressure at a refrigerator's inlet known as?

a. Back Pressure b. Critical Pressure c. Discharge Pressure **d. Suction Pressure**

44). The ideal thermal efficiency of a reversible engine is 30%. The coefficient of performance, when we use it as a type of refrigerating machine with every other condition unchanged, will be:

a. 4.33 b. 3.33 **c. 2.33** d. 1.33

45). On the psychrometric chart, the marking of the alignment circle will be at:

a. 50% RH and 20°C DBT **b. 50% RH and 26°C DBT**

c. 60% RH and 20°C DBT d. 60% RH and 26°C DBT

46). Before entering the expansion or the throttle valve, a refrigerant's condition in any vapour compression system is:

a. Dry Vapour b. Very Wet Vapour

c**. High-Pressure Saturated Liquid** d. Moist Vapour

47). Which of these types of compressors are used in our domestic refrigerators?

a. Axial b. Centrifugal **c. Piston Type Reciprocating** d. Miniature Sealed Unit

48). Which of these is the refrigerant that has the highest critical pressure?

a. R-12 **b. Ammonia** c. R-11 d. R-22

49) The instruments pyrometer used for the measurements of ---

a. high temperature b. pressure c. volume d. entropy

50) In a refrigeration cycle, heat is rejected by the refrigerant in a

(a) expansion valve
(b) condenser
(c) compressor
(d) evaporator