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QUESTION BANK (Objective)

Subject with Code :APPLICATION OF ELECTRICAL POWER (20EE0243)

Course & Branch: B.Tech&CE,ME,ECE

Year &Sem: IV-B)Tech & I-Sem **Regulation:** 20

UNIT –I

ILLUMINATION

1. Which of the following statements is correct? [ ]
   A) Light is a form of heat energy B) Light is a form of electrical energy
   C) Light consists of shooting particles D) **Light consists of electromagnetic waves**
2. Candela is the unit of which of the following? [ ]
   A) wave length B) **luminous intensity** C) Luminous flux D) Frequency
3. Colour of light depends upon [ ]
   A) Frequency B) **Wave length** C) Both A and B D) Speed of light
4. Luminous efficiency of fluorescent tubes is [ ]
   A) 10 lumens/watt B) 20 lumens/watt C) 40 lumens/watt D) **60 lumens/watt**
5. Solid angle is expressed in terms of -------- [ ]
   A) Radians/meter B) radian C) degree D) **steradians**
6. The unit of luminous flux is ------- [ ]
   A) watt/m^2 B) **lumens** C) lumens/m^2 D) watt
7. A mercury vapour lamp gives --------- light. [ ]
   A) White B) Pink C) **Yellow** D) Greenish blue.
8. Glare is reduced by [ ]
   A) Using diffusers B) Increasing the height of the lamp
   C) Using reflectors to cut-off the at certain angle D) **all of the above**
9. The colour of sodium vapour discharge lamp is [ ]
   A) Red B) Pink C) **Yellow** D) Greenish blue.
10. A reflector is provided to [ ]
    A) **Protect the lamp** B) Provide better illumination
    C) Avoid glare D) all of the above
11. Which of the following is an advantage of electricity? [ ]
    A) Quicker operation B) Higher efficiency C) Absence of flue gases D) **All of the above**
12. The function of capacitor across the supply to the fluorescent tube is primarily to. [ ]
    A) Stabilize the arc B) Reduce the starting current
    C) **Improve the supply power factor** D) Reduce the noise.
13. Illumination of one lumen per sq. meter is called------ [ ]
    A) Lumen meter B) **Lux** C) Foot candle D) Candle
14. ------ Will need lowest level of illumination. [ ]
    A) Auditorium B) **Railway platform** C) Displays D) Fine engravings.
15. Due to moonlight, illumination is nearly [ ]
    A) 3000 lumens/m^2 B) 300 lumens/m^2 C) 30 lumens/m^2 D) **0.3 lumens/m^2**
16. The purpose of coating the fluorescent tube from inside with white power is [ ]

A) To improve its life B) To change the colour of light emitted to white
C) To improve the appearance D) **To increase the light radiations due to secondary emission**

17. A mercury vapour lamp gives --------- light. [ ]
A) White B) Pink C) Yellow D) **Greenish blue.**

18. The illumination at various points on horizontal surface illuminated by the same source varies as. [ ]
A) **COS^{3}Θ** B) COS Θ C) l/r^2 D) COS^{2}Θ

19. The M.S.C)P. of a lamp which gives out a total luminous flux of 400 Л ---- candelA) [ ]
A) 200 B) **100** C) 50 D) 40

20. The direct lighting scheme is most efficient but is liable to cause. [ ]
A) monotony B) glare C) hard shadows D) **Both (B) and (C)**

21. Total flux required in lighting scheme depends inversely on [ ]
A) Illumination B) Surface area C) **Utilization factor** D) Space/height ratio

22. 1. The average working life of a fluorescent lamp is about ---------- hours. [ ]
A) 1000 B) **4000** C) 3000 D) 5000

23. The luminous efficiency of a sodium vapour lamp is about ------- lumen/watt [ ]
A) 10 B) 30 C) 50 D) **70**

24. ------- will need lowest level of illumination. [ ]
A) Auditoriums B) **Railway platform** C) Displays D) Fine engravings

25. In electrical discharge lamps light is produced by [ ]
A) Cathode ray emission B) **Ionization in a gas or vapour**
C) Heating effect of current D) Magnetic effect of current

26. For normal reading the illumination level required is around [ ]
A) 20 – 40 lumens/m^2 B) **60 – 100 lumens/m^2**
C) 200 – 300 lumens/m^2 D) 400 – 500 lumens/m^2

27. A substance which change its electrical resistance when illuminated by light is called [ ]
A) Photoelectric B) Photovoltaic C) **Photo conductive** D) None of the above

28. -------- is a cold cathode lamp. [ ]
A) Fluorescent lamp B) **Neon lamp** C) Mercury vapour lamp D) Sodium vapour lamp

29. For precision work the illumination level required is of the order of [ ]
A) **500 – 1000 lumens/m^2** B) 200 – 2000 lumens/m^2
C) 50 – 100 lumens/m^2 D) 10 – 25 lumens/m^2

30. The tungsten filament lamps when compared with fluorescent tubes have all the following Advantages except.
A) Simple installation B) **Long life** C) Less costly D) More brightness.

31. Incandescent lamps, coiled coil filaments are used for [ ]
A) Coloured lamps B) Higher wattage lamps C) **Gas filled lamps** D) Low wattage lamps

32. Soft shadows are produced by [ ]
A) Using surface source of light instead of point source of light.
B) Increasing the number of lamps
C) **Both A and B**
D) None of the above

33. Which of the following is present inside the fluorescent tube? [ ]
A) Argon and neon B) Argon and CO_2 C) **Mercury vapour** D) Helium and oxygen

34. Which of the following bulb operates on least power? [ ]
A) GLS bulb B) **Torch bulb** C) Neon bulb D) Night bulb

35. In case of -------- least illumination level is requireD) [ ]
A) Skilled bench work B) Drawing offices C) **Hospital wards** D) Fine machine work.

36. ------- does not have separate choke . [ ]
A) **Sodium vapour lamp** B) Fluorescent lamp C) Mercury vapour lamp D) All the above.

37. Most affected parameter of a filament lamp due to voltage change is [ ]
A) Wattage B) **life** C) Luminous efficiency D) Light output

38. The luminous flux is [ ]

A) The light energy radiated by sun
B) The part of light energy, radiated by sun, which is received on the earth
C) **The rate of energy radiation in the form of light waves**
D) None of the above

39. Co-efficient of utilization depends upon-------- [ ]
A) Colour of the wall B) Colour of ceiling C) Size the room D) **All the above**

40. The gas filled in vacuum filament lamp is [ ]
A) Nitrogen B) Argon C) Air D) **None**

UNIT –II

ELECTRIC HEATING

1. Which of the following is an advantage of electricity? [ ]
A) Quicker operation B) Higher efficiency C) Absence of flue gases D) **All of the above**

2. ------- method has leading power factor [ ]
A) Resistance heating B) **Dielectric heating** C) Arc heating D) Induction heating

3. Which of the following methods is used to control temperature in resistance furnaces [ ]
A) Variation of resistance B) Variation of voltage
C) Periodical switching on and off the supply D) **All of the above methods**.

4. Radiations from a black body are proportional to [ ]
A) T B) T^2 C) T^3 D) $\mathbf{T^4}$

5. In the indirect resistance heating method, maximum heat-transfer takes place by [ ]
A) **Radiation** B) Convection C) Conduction D) Any of the above

6. Induction furnaces are employed for which of the following? [ ]
A) **Heat treatment of castings** B) Heating of insulators
C) Melting of aluminum D) None of the above.

7. In resistance heating highest working temperature is obtained from heating elements made of -------- [ ]
A) Nickel copper B) Nichrome C) **Silicon carbide** D) Silver

8. As compare to other methods of heating using gas and coal etc, electric heating is far superior because of its. [ ]
A) Cleanliness B) Ease of control C) **Higher efficiency** D) All the above

9. Magnetic materials are heated with the help of [ ]
A) **Hysteresis loss** B) Electric arc C) electric current D) radiation

10. The main requirements of a good heating element used in a resistance furnaces are [ ]
A) High resistivity B) High melting - temperature
C) Positive resistance – temperature coefficient D) **All the above**

11. ------- has the highest value of thermal conductivity. [ ]
A) **Copper** B) Aluminum C) Brass D) Steel

12. When a body reflects entire radiation incident on it, then it is known as: [ ]
A) **White body** B) Grey body C) Black body D) Transparent body

13. Induction heating -------- is abnormally high [ ]
A) Phase angle B) **Frequency** C) Current D) Voltage.

14. In direct arc furnace, which of the following has high value? [ ]
A) **Current** B) Voltage C) Power factor D) All the above

15. For intermittent work which of the following furnaces is suitable? [ ]
A) Radiation B) Convection C) Conduction D) **any of the above**

16. ------- is used for heating non-conducting materials. [ ]
A) Eddy current heating B) Arc heating C) Induction heating D) **Dielectric heating**

17. In an electric room heat convector the method of heating used is [ ]
A) Arc heating B) **Resistance heating** C) Induction heating D) Dielectric heating

18. Conceptually the maximum temperature that can be obtained using electric heating is [ ]
A) 1150 ºC B) 3600 ºC C) 2000 ºC D) **None**

19. Heat is to be transmitted in vacuum, then the mode of heat transfer will be [ ]
A) Conduction B) Convection C) **radiation** D) both b and c

20. If the temperature difference between source and the charge is high, then the majority of heat transfer takes place through [ ]
A) Conduction B) Convection C) **radiation** D) none

21. The heating element having zero temperature co-efficient is [ ]
A) Nichrome B) **Constantan** C) Kanthal D) Tungsten

22. In coreless induction furnace the supply frequency employed is ___ Hz
A) 50 B) 60 C) 25 D) **500**

23. The heat required to raise the temperature of 5400 Kg of water from 20 ºC to 65 ºC is _____ KWH. Given specific heat of water is 4200J/Kg/ºC and 1 KWH = 3.6 MJ [ ]
A) 270.5 B) 203.55 C) 185.33 D) **283.5**

24. The dielectric loss is proportional to [ ]
A) V B) $\mathbf{V^2}$ C) V^3 D) $1/V^2$

25. The higher the value of loss angle, the health state of dielectric material is [ ]
A) more B) **less** C) does not depend D) none

26. ---------- method has leading power factor [ ]
A) resistance heating B) **dielectric heating** C) induction heating D) arc heating

27. ---------- is used for heating non conducting materials [ ]
A) eddy current heating B)arc heating C) induction heating D) dielectric heating

28. in a resistance furnaces the atmosphere is [ ]
A) **oxidizing** B) deoxidizing C) reducing D) neutral

29. in induction heating ---------- is abnormally high [ ]
A) Phase angle B) **frequency** C) current D) voltage

30. Induction furnaces are employed for which of the following [ ]
A) **heat treatment of casting** B) heating of insulators C) melting of aluminum D) none of the above

31. in the indirect resistance heating method maximum heat –transfer takes place by [ ]
A) **radiation** B) convection C) conduction D) any of the above

32. Which type of furnace uses eddy currents for heating [ ]
A) **induction heating** B) dielectric heating C) resistance heating D) all the above

33. Nichrome is suitable for temperatures up to _____ ºC [ ]
A) 400 B) 2000 C) **1150** D) 3000

34. For radiant heating around 2250c the heating element are made of [ ]
A) copper alloy B) carbon C) **tungsten alloy** D) stainless steel alloy

35. The main advantage of dielectric heating is that [ ]
A) **heating occurs in the material itself**. B) heating occurs due to high frequency.
C) it can be used for drying the explosives. D)None of the above.

36. The most modern method for food processing is [ ]
A) Eddy current heating. B) **Dielectric heating**. C) Induction heating. D) Resistance heating.

37. Which of the following method of heating does not depend on frequency of supply? [ ]
A) induction heating B) dielectric heating C) **resistance heating** D) all the above

38. _____ is not an application of dielectric heat. [ ]
A) Diathermy. B) **Soldering.** C) Food processing. D) Gluing of wood

39. Hysteresis loss and eddy current loss arc used in [ ]
A) Dielectric heating. B) **Induction heating of steel.**
C) Induction heating of brass. D) Resistance heating.

40. In inducting heating, which of following is of high value?
A) Voltage. B) Current. C) **Frequency.** D) Power factor.

UNIT –III

ELECTRIC WELDING

1. During resistance welding heat produced at the joint is proportional to [ ]
A) **I^2R** B) KVA C) Current D) Voltage
2. The metal surfaces, for electric resistance welding must be ------ [ ]
A) Lubricated B) **cleaned** C) moistened D) rough.
3. In arc welding major personal hazards are [ ]
A) Flying sparks B) Weld spatter
C) Harmful infrared and ultra-violet rays from the arc D) **all the above**
4.For the arc welding current range is usually [ ]
A) 10 – 15A B) 30 – 40A C) 50 – 100A D) **100 – 350 A**
5. In ultrasonic welding the frequency range is generally. [ ]
A) 2000 to 3000 Hz B) **4000 to 20000 Hz** C) 30000 to 40000 Hz D) 50000 to 80000 Hz
6. Which of the following equipment is generally used for arc welding? [ ]
A) Single phase alternator B) Two phase alternator
C) Three phase alternator D) **Transformer.**
7. Resistance welding cannot be used for [ ]
A) **Dielectric** B) Ferrous material C) Non-ferrous material D) Any of the above
8. In spot welding composition and thickness of the base metal decides [ ]
A) The amount of squeeze pressure B) Hold time
C) The amount of weld current D) **All above**
9. Helium produces which of the following? [ ]
A) Deeper penetration B) Faster welding speeds
C) Narrower heat affected zone in base metal D) **None of the above**.
10. Due to which of the following reasons aluminum is difficult to weld? [ ]
A) It has an oxide coating B) It conducts away heat very rapidly
C) **Both A & B** D) None of the above.
11. Electric arc welding process produces temperature up to [ ]
A) 1000° C B) 1500° C B) 3500° C D) **5550° C**
12. During spot welding the current flows for [ ]
A) Fraction of a minute to several minutes B) Fraction of a second to several seconds
C) Few milliseconds D) **Few microseconds.**
13. During carbon arc welding [ ]
A) Electrodes is connected to neutral if A.C is used
B) Electrode is not connected to any voltage source when A.C is used
C) **Electrode is negative with respect to the work if D.C is used**
D) Electrode is positive with respect to the work if D.C is used
14. The purpose of coating on arc welding electrodes is to [ ]
A) Stabilize the arc B) Provide a protecting atmosphere
C) Provide slag to protect the molten metal D) **All the above**
15. The type of welding used for pressure tight joint is [ ]
A) Spot welding B) **seam welding** C) protection welding D) Butt welding
16. The type of electric supply that can be employed in carbon arc welding is [ ]
A) Only A.C B) **Only D.C** C) Both A.C and D.C D) None
17.An example for plastic welding is [ ]
A) **Forge welding** B) Gas welding C) Electron beam welding D) Carbon arc welding
18. The resistance welding method best suitable for high conductivity metals is [ ]
A) Spot welding B) **Percussion welding** C) seam welding D) Projection welding

19. Arc blow results in which of the following?
A) Non-uniform weld beads
B) Shallow weld puddle giving rise to weak weld
C) Splashing out of metal from weld puddle
D) **All of the above defects**

20. _____ welding is not a resistance welding process [ ]
A) Projection B) Seam C) flush D) **carbon arc**

21. Which of the following is not a welding accessory [ ]
A) Hand screen B) **cable** C) electrode holder D) gloves

22. grey iron is usually welded by ---------- welding [ ]
A) **gas** B) arc C) resistance D) MIG

23. Rolling electrodes are specifically used for [ ]
A) projection welding B) **seam welding** C) spot welding D) Flash butt welding

24. In electric arc produced for welding purpose the hottest part is the: [ ]
A) **Cathode spot** B) Anode spot C) Arc stream D) work piece

25. D.C welding and A.C welding have some different opposing characteristics. These include [ ]
A) Effect on line regulation B) Nature of source C) control panels necessity D) **All the above**

26. In a welded joint poor fusion is due to which of the following? [ ]
A) **Improper current**
B) High welding speed
C) Uncleaned metal surface
D) Lack of flux

27. For arc welding, D.C is produced by which of the following? [ ]
A) **Motor-generator set**
B) Regulator
C) Transformer
D) None of the above

28. Electronic components are joined by which of the following methods? [ ]
A) Brazing
B) **Soldering**
C) Seam welding
D) Spot welding

29. In seam welding [ ]
A) the work piece is fixed and disc electrodes move
B) the work piece moves but rotating electrodes are fixed
C) **any of the above**
D) none of the above

30. In arc welding, major personal hazards are [ ]
A) flying sparks
B) weld spatter
C) harmful infrared and ultra-violet rays from the arc
D) **all of the above**

31. Spot welding is used for [ ]
A) **thin metal sheets**
B) rough and irregular surfaces
C) costings only
D) thick sections

32. In argon arc welding argon is used as a [ ]
A) flux
B) source of heat
C) agent for heat transfer
D) **shield to protect the work from oxidation**

33. During arc welding as the thickness of the metal to be welded increases [ ]
A) current should decrease, the voltage should increase
B) **current should increase, voltage remaining the same**
C) current should increase, the voltage should decrease
D) voltage should increase, current-remaining the same
34. During carbon arc welding if electrode is connected to positive [ ]
A) are will be dull
B) arc will not strike
C) metal will not strike
D) **carbon will have a tendency to go into the weld joint**
35. In which of the following methods of welding the molten metal is poured for joining the metals?
A) **Thermit welding** **[ ]**
B) Gas welding
C) TIG welding
D) Arc welding
36. In atomic hydrogen welding, the electrode is made of [ ]
A) carbon
B) graphite
C) **tungsten**
D) mild steel
37. The porosity of welded joint may be caused by [ ]
A) low welding current
B) incorrect size of electrodes
C) **poor base metal**
D) any of the above
38. In electrical resistance welding, the greatest resistance is offered by which of the following?
A) Metal surface [ ]
B) Contact point of electrode with metal top
C) Contact point of an electrode with a metal bottom
D) **Contact layer of metals to be welded**
39. The tips of the electrodes, for spot welding, are made of [ ]
A) **copper alloy**
B) porcelain
C) mica
D) carbon
40. The power factor of a spot welding machine is expected to be around [ ]
A) Unity
B) 0.8 lagging
C) **0.3 to 0.5 lagging**
D) 0.8 leading

UNIT –IV

ELECTROLYSIS

1. The processes based on the fact that electrical energy can produce chemical changes are called ---------- Processes. [ ]
A) Electrolytic B) Magnetic C) Electrostatic D) **None of this**
2. Faraday's ------ law states that the mass of a substance liberated from an electrolyte in a given Time is proportional to the quantity of electricity passing through the electrolyte. [ ]
A) Second B) First C) **Both A & B** D) None of this

3. In the process of electroplating the circuitry involved is [ ]
A) Polarized B) Non-Polarized C) Depends upon nature of plating D) **None of above**
4. The existence of a counter electrode is observed some where is the [ ]
A) Plating vats B) Electro-chemical cleaning baths
C) D.C supply sources D) **Nothing as above is connected with the plating system**
5. The capacitor bank installed in the rectifier system of any electroplating Plant is meant for [ ]
A) Smoothing the effects of loads variation
B) Minimizing the ripple content of the D.C supply
C) **To improve power factor and line regulation of the mains feeding the rectifier system**
D) All as above
6. Spongy coating of electroplating speaks of [ ]
A) Under current density B) **Over current density**
C) Excessive electrolyte density D) Poorer electrolyte density
7. The metal being deposited is available in form of [ ]
A) Constituent of electrolyte B) One of the electrodes C) **Both as above** D) None
8. Chrome plating done as [ ]
A) Primary layer B) Secondary layer C) Tertiary layer D) **None**
9. Polarization on cathode surface can be checked through [ ]
A) Limiting current magnitude B) Agitation of electrolyte
C) Periodical reverse plating D) **All as above**
10. The six phase rectifier circuit meant for electroplating needs [ ]
A) special A)C generator B) **normal three phase mains** C) the system A & B is just a theoretical possibility D) none]
11. in the process of electroplating the circuitry involved is [ ]
A) **polarized** B) non polarized C) depends upon nature of plating D) none out of above
12. the object undergoing surface plating work as [ ]
A) **cathode** B) anode C) depends upon nature of supply source D) none
13. The compound genets used for the electroplating purpose is [ ]
A) differentially exited B) **cumulatively exited** C) depends upon plating load D) none
14. The preferred vat polarity is [ ]
A) **positive** B) negative C) zero potential without any polarity D) an arbitrary choice
15. Mopping is another name of [ ]
A) grinding B) **polishing** C) abrasion D) none of the above
16. Spongy coating of electro plating speaks of [ ]
A) under current density B) **over current density** C) excess electrolyte density D) poorer electrolyte density
17. Chrome plating is done as [ ]
A) Primary layer B) secondary layer C) **tertiary layer** D) none
18. Polarization on cathode surface can be checked through [ ]
A) limiting current magnitude B) agitation of electrolyte C) periodical reverse plating
D) **all as above**
19. The metal being deposited is available in the form of [ ]
A) constituent of electrolyte B) one of the electrodes C) **both as above** D) none of above
20. What is electrolysis? [ ]
A) The process of converting electrical energy into mechanical energy
B) The process of converting electrical energy into heat energy
C) **The process of using electricity to bring about a chemical change**
D) The process of using light to generate electricity
21. What happens to the anode and cathode during electrolysis? [ ]
A) Both anode and cathode gain electrons
B) Both anode and cathode lose electrons

C) Anode gains electrons, and cathode loses electrons
D) **Anode loses electrons, and cathode gains electrons**

22. Which type of ions migrate towards the cathode during electrolysis? [ ]
A) Anions (negatively charged ions)
B) **Cations (positively charged ions)**
C) Protons (positively charged particles)
D) Neutrons (neutral particles)

23. What is electroplating? [ ]
A) The process of converting electrical energy into mechanical energy
B) The process of using electricity to bring about a chemical change
C) **The process of depositing a layer of metal onto an object using electrolysis**
D) The process of converting electrical energy into heat energy

24. Which metal is commonly used as the anode in electroplating? [ ]
A) Copper
B) Silver
C) **Nickel**
D) Gold

25. What is the purpose of using a salt solution as an electrolyte in electroplating? [ ]
A) **To provide a conducting medium for the flow of electric current**
B) To prevent the plating metal from reacting with the object's surface
C) To increase the temperature during electroplating
D) To generate hydrogen gas during electrolysis

26. What is the primary metal used in silver electroplating? [ ]
A) **Silver**
B) Copper
C) Nickel
D) Zinc

27. What is the purpose of using electroplating in the manufacturing industry? [ ]
A) To increase the electrical resistance of objects
B) To decrease the weight of objects
C) **To improve the appearance of objects**
D) To reduce the cost of production

28. Which metal is commonly used for electroplating iron objects to prevent rusting? [ ]
A) Gold
B) Copper
C) **Zinc**
D) Aluminum

29. In the electrolysis of water, what gases are produced at the anode and cathode, respectively?
A) Oxygen and nitrogen [ ]
B) **Hydrogen and oxygen**
C) Oxygen and carbon dioxide
D) Nitrogen and hydrogen

30. Which of the following is Strong electrolyte? [ ]
A) Acetic acid
B) **Nitric acid**
C) Formic acid
D) Calcium hydroxide

31. Solution used during electroplating of nickel [ ]
A) $NiSO_4$
B) $NiCO_3$
C) $NiSO_3$
D) **Ni_2SO_4**

32. If copper has to be plated with silver then copper is made___ [ ]
A) Cathode
B) **Anode**
C) Electrolyte
D) None of these
33. Faraday's laws of electrolysis are related to the: [ ]
A) atomic number of the cation
B) atomic number of the anion
C) **equivalent mass of the electrolyte**
D) speed of the cation
34. The electric charge for electrode deposition of one equivalent of the substance is: [ ]
A) one ampere per second
B) 96,500 Coulombs per second
C) one ampere per hour
D) **charge on 1 mole of electrons**
35. Faraday's laws of electrolysis will fail when [ ]
A) Temperature is increased
B) Inert electrodes are used
C) A mixture of electrolytes is used
D) **In none of these cases**
36. How is the material removed in Electropolishing process? [ ]
A) **Anodic dissolution**
B) Cathodic dissolution
C) Chemical corrosion
D) Mechanical erosion
37. In the following terminals, part to be finished acts as which terminal in Electropolishing process?
A) **Anode** [ ]
B) Cathode
C) Neutral
D) None of the mentioned
38. What amount of current density can be used for Electropolishing to take place? [ ]
A) Very low
B) **Low**
C) Optimum
D) Very high
39. Which of the following is not an application of electroplating? [ ]
A) Decorative purposes
B) Coating of metal
C) Metal protection
D) **Corrosion prevention**
40. Electroplating of chromium helps in preparing of _____ [ ]
A) **Car bumpers**
B) Saucepans
C) Cutlery
D) Watches

UNIT –V

ELECTRIC TRACTION

1. Free running and coasting periods are generally long in case of [ ]
A) City service B) Sub urban service C) **Main line service** D) Outer sub urban service

2.Trapezoidal speed time curve pertains of which of the following services [ ]
A) **Main line service** B) Urban service C) Sub urban service D) Urban/sub urban service
3. Quadrilateral speed time curve is the close approximation for [ ]
A) Urban service B) Sub urban service C) **Urban/sub urban service** D) Main line service
4.In sub urban trains the train motors are installed in [ ]
A) Locomotive only B) locomotive and coaches
C) **Coaches only** D) A & B
5. Which of the following motor is preferred for traction work [ ]
A) Universal motor B) **DC series motor**
C) Synchronous motor D) Three phase induction motor.
6. Main traction system used in India are using _____ locomotives [ ]
A) Steam engine B) Diesel engine C) Electric engines D) **All of the above**
7. Sub urban railways use [ ]
A) **1500 V DC** B) 400 V, 3 phase AC C) 330 V 3 phase AC D) 600 V 3 phase AC
8. Long distance railways operate in [ ]
A) 600 V DC B) **25 KV single phase AC** C) 25 KV 3 ph AC D) 15 KV 3 ph AC
9. The braking retardation for urban (or) sub urban service is [ ]
A) 1.5-2.5 KMPHS B) 3-4 KMPHS C) 5-10 KMPHS D) **0.5-1.5 KMPHS**
10. Maximum horse power of steam locomotive is [ ]
A) 100 B) 500 C) 1500 D) **2500**
11. In Kando system of track electrification, ------- is converted into ----- [ ]
A) 1-phase AC, DC B) 3-phase AC, 1- phase AC
C) **1-phase AC, 3- phase AC** D) 3-phase AC, DC
12. The current collector which can be used at different speeds under all wind conditions and stiffness of OHE is called --------- [ ]
A) Trolley B) Bow C) Pantograph D) **Messenger**
13. Long distance railways use which of the following? [ ]
A) 220V D)C B) **25 KV 1-Phase A)C**
C) 25 KV 2-Phase A)C D) 25 KV 3-Phase A)C
14. Speed of locomotive controlled by [ ]
A) **Flywheel** B) Gear box
C) Applying brakes D) Regulating steam flow to engine
15. In India diesel locomotives are manufactured at [ ]
A) Ajmer B) Varanasi C) **Bangalore** D) Jabalpur
16. For diesel locomotive the range of horsepower is [ ]
A) 50 to 200 B) 500 to 1000 C) **1500 to 2500** D) 3000 to 5000
17. ------- locomotive has the highest operational availability. [ ]
A) **Electric** B) Diesel C) Steam D) None of the above
18. The overall efficiency of steam locomotive is around [ ]
A) **5 to 10 percent** B) 15 to 20 percent C) 25 to 35 percent D) 35 to 45 percent
19. In tramways which of the following motor is used? [ ]
A) DC shunt motor B) **DC series motor**
C) AC 3-phase motor D) AC 1-phase capacitor start motor
20. In a steam locomotive electric power is provided through [ ]
A) Overhead wire B) Battery system C) **Small turbo generato**r D) Diesel engine generator
21. Which of the following drives is suitable for mines where explosive gas exists? [ ]
A) Steam engine B) Diesel engine C) **battery locomotive** D) Any of the above
22. Electric locomotive in India are manufactured at [ ]
A) Jabalpur B) Bangalore C) **Chittranjan** D) Gorakhpur
23. The wheels of a train, engine as well as bogies are slightly tapered to [ ]
A) Reduce friction B) Increase friction C) Facilitate braking D) **Facilitate in taking turns**
24. The efficiency of diesel locomotives is nearly [ ]
A) **20 to 25 %** B) 30 to 40 % C) 45 to55% D) 60 to 70 %
25. Which of the following motor is preferred for traction work [ ]

A) Universal motor B) **DC series motor**
C) Synchronous motor D) Three phase induction motor.

26. Main traction system used in India are using _____ locomotives [ ]
A) Steam engine B) Diesel engine C) Electric engines D) **All of the above**

27. Sub urban railways use [ ]
A) 1500 V DC B) 400 V, 3 phase AC C) 330 V 3 phase AC D) **600 V 3 phase AC**

28. Long distance railways operate in [ ]
A) 600 V DC B) **25 KV single phase AC** C) 25 KV 3 ph AC D) 15 KV 3 ph AC

29. The braking retardation for urban (or) sub urban service is [ ]
A) 1.5-2.5 KMPHS B) 3-4 KMPHS C) 5-10 KMPHS D) **0.5-1.5 KMPHS**

30. Maximum horse power of steam locomotive is [ ]
A) 100 B) 500 C) **1500** D) 2500

31. In Kando system of track electrification, ------- is converted into ----- [ ]
A) 1-phase AC, DC B) 3-phase AC, 1- phase AC
C) **1-phase AC, 3- phase AC** D) 3-phase AC, DC

32. The current collector which can be used at different speeds under all wind conditions and stiffness of OHE is called --------- [ ]
A) Trolley B) Bow C) Pantograph D) **Messenger**

33. Long distance railways use which of the following? [ ]
A) 220V DC B) **25 KV 1-Phase AC**
C) 25 KV 2-Phase AC D) 25 KV 3-Phase AC

34. Speed of locomotive controlled by [ ]
A) **Flywheel** B) Gear box
C) Applying brakes D) Regulating steam flow to engine

35.The speed of a superfast train is [ ]
A) 60 kmph B) 75 kmph C) 100 kmph D) **More than 100 kmph**

36. Which of the following state capitals is not on broad gauge track? [ ]
A) Lucknow B) Bhopal C) **Jaipur** D) Chandigarh

37. Which of the following is the advantage of electric braking? [ ]
A) **It avoids wear of track** B) Motor continues to remain loaded during braking
C) It is instantaneous D) More heat is generated during braking

38. Which of the following braking systems on the locomotives in costly? [ ]
A) **Regenerative braking on electric locomotives** B) Vacuum braking on diesel locomotives
C) Vacuum braking on steam locomotives D) All braking systems are equally costly

39. For given maximum axle load tractive efforts of A.C locomotive will be [ ]
A) Less than that of D)C) locomotive B) **More than that of DC locomotive**
C) Equal to that of D)C) locomotive D) None of the above

40. Co-efficient of adhesion reduces due to the presence of which of the following? [ ]
A) Send on rails B) Dew on rails C) Oil on the rail D) **Both (B) and (C)**

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Application of Electrical Power (20EE0243) **Course & Branch**: B.Tech &CE,ME, ECE

Year & Sem: IV-B.Tech & I-Sem

UNIT –I
ILLUMINATION

1	a) Draw and explain the operation of sodium vapor lamp with neat diagram.	[L1][CO1]	**[5M]**
	b) A lamp having a uniform cp of 100 in all direction is provided with a reflector which directs 60% of the light uniformly on to a circular area of10m diameter. The lamp is hung 5m above the area. Calculate the illumination at the center.	[L2][CO1]	**[5M]**
2	a) State and explain laws of illumination briefly.	[L1][CO1]	**[5M]**
	b) Six lamps are used to illuminate a certain room. If the luminous efficiency of each lamp is 12 lumens/watt and the lamps have to emit a total lux of 10,000 lumens, calculate (i) The mean spherical luminous intensity (ii) The cost of energy consumed in 3 hours if the charge for electrical energy is 50 paise per unit.	[L3][CO1]	**[5M]**
3	a) If a lamp of 200 cp is placed 1m below a plane mirror which reflects 90% of light falling on it, determine illumination at a point 3 m away from the foot of the lamp which is hung 4 m above ground.	[L3][CO1]	**[5M]**
	b) Explain with sketch the principle and operation of incandescent lamp and enumerates its advantages and disadvantages.	[L1][CO1]	**[5M]**
4	a) A 250 CP lamp is hung 4m above the center of a circular area of 6m diameter. Calculate the illumination at the (i) Centre of area. (ii) Periphery of the area. (iii) Average illumination	[L3][CO1]	**[5M]**
	b) Explain the various factors to be taken into account for designing schemes for (i) Factory lighting (ii) Street lighting	[L2][CO1]	**[5M]**
5	A machine shop 40m×20m is to have an illumination of 160lux on working plane. The lamps are mounted on 6m above the working plane. Give the layout of a suitable installation. a) Using filament lamp. b) Using 50 watts fluorescent lamp. Assume necessary data.	[L3][CO1]	**[10M]**
6	a) Write short notes on polar curves.	[L1][CO1]	**[5M]**
	b) A filament lamp of 500W is suspended at a height of 4.5 m above the working plane and gives uniform illumination over an area of 6 m diameter. Assuming an efficiency of the reflector as 70% and efficiency of lamp as 0.8 watt per candle power, determine the illumination on the working plane	[L3][CO1]	**[5M]**
7	State the laws of illumination. Explain the laws with the help of suitable diagrams and derive an equation of the same.	[L1][CO1]	**[10M]**
8	a) A room measuring 30m×15m is to be illuminated by 10 lamps and the average illumination is to be 85 lux. Determine the MSCP of each lamp if the utilization and depreciation factors are 0.5 and 0.8 respectively	[L3][CO1]	**[5M]**
	b) Briefly explain the requirement of good lighting scheme.	[L2][CO1]	**[5M]**
9	a) Explain with sketch the principle and operation of fluorescent lamp.	[L3][CO1]	**[5M]**
	b) Write short notes on incandescent lamp.	[L2][CO1]	**[5M]**

10	Write short notes on: a) Define luminous flux. b) Define Mean spherical candle power c) Define lamp efficiency d) Define space-height ratio e) Define luminance.	[L2][CO1] [L2][CO1] [L2][CO1] [L2][CO1] [L2][CO1]	**[2M]** **[2M]** **[2M]** **[2M]** **[2M]**

UNIT –II
ELECTRIC HEATING

1	a) Briefly discuss the method of Dielectric heating.	[L2][CO2]	**[8M]**
	b) Briefly discuss the applications of resistance heating.	[L2][CO2]	**[2M]**
2	a) Describe direct core type furnace with neat sketch.	[L2][CO2]	**[5M]**
	b) Explain application of induction heating.	[L3][CO2]	**[5M]**
3	a) What are the different types of heating? Write advantages of electric heating.	[L1][CO2]	**[5M]**
	b) A low frequency induction furnace whose secondary voltage is maintained constant at 10 volts, takes 400 kW at 0.6 pf, when the hearth is full. Assuming the resistance of the secondary to vary inversely as the height of the charge and reactance to remain constant, height up to which the hearth should be filled to obtain maximum heat.	[L3][CO2]	**[5M]**
4	a) Discuss briefly about induction heating process.	[L2][CO2]	**[5M]**
	b) A slab of insulating material 150 sq cm in area and 1 cm thick is to be heated by dielectric heating. The power required is 400 W at 30×10^6 cps. Materials has permittivity of 5 and power factor of 0.05. Determine voltage necessary.	[L3][CO2]	**[5M]**
5	a) Explain with a neat sketch the principle of coreless type induction furnace.	[L1][CO2]	**[7M]**
	b) What are the causes of failure of heating element?	[L2][CO2]	**[3M]**
6	a) Explain the working of Ajax Wyatt vertical core furnace with a neat sketch	[L1][CO2]	**[5M]**
	b) Explain the principle of Induction heating. What are the applications of Induction heating.	[L2][CO2]	**[5M]**
7	a) Describe Indirect core type furnace with neat sketch.	[L2][CO2]	**[5M]**
	b) Briefly discuss the applications of Dielectric heating?	[L2][CO2]	**[5M]**
8	Discuss the principle ,advantages and disadvantages of dielectric heating.	[L2][CO2]	**[10M]**
9	a) What are the disadvantages of direct core type induction furnace?	[L2][CO2]	**[5M]**
	b) Determine the amount of energy required to melt brass at the rate of one ton per hour in a single phase Ajax Wyatt furnace. Specific heat of brass is 0.094 Kcal/ Kg/^oC. Latent heat of fusion is 40 Kcal/Kg, initial temperature is 24 ^oC, melting point of brass is 920 ^oC. Assume efficiency to be 65 %.	[L3][CO2]	**[5M]**
10	Write short notes on: a) Infrared heating b) pinch effect in induction heating. c) various modes of heat transfer. d) advantages of coreless induction furnace e) disadvantages of direct core type induction furnace	 [L1][CO2] [L2][CO2] [L3][CO2] [L1][CO2] [L1][CO2]	 **[2M]** **[2M]** **[2M]** **[2M]** **[2M]**

UNIT –III
ELECTRIC WELDING

1	a) Write briefly about flash welding.	[L1][CO3]	**[5M]**
	b) Differentiate between A.C and D.C welding.	[L2][CO3]	**[5M]**
2	a) Briefly discuss the welding electrodes of various metals.	[L1][CO3]	**[5M]**
	b) Explain briefly the arc welding process.	[L1][CO3]	**[5M]**
3	Explain the different methods of electric welding and their relative advantages.	[L1][CO3]	**[10M]**
4	Discuss about the techniques used for arc welding.	[L2][CO3]	**[10M]**
5	Describe with a neat sketch the various methods of electric resistance welding.	[L1][CO3]	**[10M]**
6	a) Explain about metal arc welding, carbon arc welding methods with necessary illustrations.	[L2][CO3]	**[5M]**
	b) What type of electric supply is suitable for electric arc welding?	[L2][CO3]	**[5M]**
7	Explain in detail about the following with respect to Welding: i) Spot welding ii) Seam welding iii) Butt welding iv) projection welding	[L2][CO3]	**[10M]**
8	a) Write about various types of equipment used for electric welding.	[L3][CO3]	**[5M]**
	b) Discuss the advantages and disadvantages of welding?	[L2][CO3]	**[5M]**
9	a) Explain about inert gas arc welding, atomic hydrogen arc welding methods with necessary illustrations.	[L2][CO3]	**[5M]**
	b) What are the qualities of a good weld?	[L2][CO3]	**[5M]**
10	Write short notes on: a) Welding transformer characteristics. b) Spot welding. c) arc stability d) arc welding accessories e) advantages of resistance welding.	 [L1][CO3] [L1][CO3] [L1][CO3] [L1][CO3] [L2][CO3]	 **[2M]** **[2M]** **[2M]** **[2M]** **[2M]**

UNIT –IV
ELECTROLYSIS

1	a) What is electrolysis? Give advantages of using this processing method.	[L2][CO4]	**[5M]**
	b) Explain the widely used areas of electrolysis.	[L2][CO4]	**[5M]**
2	Discuss the various applications of electrolysis in detail.	[L2][CO2]	**[10M]**
3	a) Discuss about the process of electro plating.	[L2][CO2]	**[5M]**
	b) Discuss about Faraday's laws of electrolytic process.	[L2][CO2]	**[5M]**
4	Describe briefly the process of electrolysis and power supply for electrolysis.	[L1][CO4]	**[10M]**
5	Ii is required, to repair a worn out circular shaft 15 cm in diameter and 32 cm long bv coating it with a layer of 1.6 mm of nickel. Determine the theoretical quantity of electricity required and the time taken if the current density used is 210 A/m^2. Electrochemical equivalent of nickel is $30.4x10^{-8}$ Kg/C of electricity and density of nickel is 8.9 $x10^3$ Kg/m^3.	[L3][CO4]	**[10M]**
6	a) Explain the factors on which quality of electrodeposition depends.	[L2][CO4]	**[5M]**
	b) Explain the terms used in electrolytic processes: (i) Current efficiency (ii) Energy efficiency	[L3][CO4]	**[5M]**
7	Calculate the thickness of copper deposited on a plate area of 2.2 cm^2 during electrolysis if a current of 1 A is passed. for 90 minutes. E.C.E. of copper = 32.95 x 10^{-8} kg/C and density of copper is 8900 Kg/m^3.	[L3][CO4]	**[10M]**
8	a) Explain Electrodeposition of rubber in detail.	[L2][CO4]	**[5M]**
	b) What are the various operations involved in electroplating.	[L1][CO4]	**[5M]**
9	a) Explain about Electro-polishing.	[L1][CO4]	**[5M]**

	b) What are the objectives of electroplating.	[L1][CO4]	**[5M]**
10	Calculate the quantity of aluminium produced from aluminium oxide in 24 hours if the average current is 2800 A and. current efficiency is 95 per cent. Aluminiurn is trivalent and atomic weight is 27. The chemical equivalent weight and E.C.E of sliver are 107.98 and $111x10^{-8}$ Kg/C respectively.	[L3][CO4]	**[10M]**

UNIT –V
ELECTRIC TRACTION

1	a) Compare A.C traction with D.C traction with necessary examples.	[L2][CO5]	**[5M]**
	b) Explain about the different methods of electric braking systems in the case of traction.	[L3][CO5]	**[5M]**
2	Discuss the characteristic features of a traction motor for effective traction systems	[L2][CO5]	**[10M]**
3	a) What are the special features of traction motors?	[L3][CO5]	**[3M]**
	b) A goods trains weighing 300 tonnes is to be hauled by a locomotive up a gradient of 2% with an acceleration of 1 kmphps. Coefficient of adhesion is 20%. Track resistance = 45 W/Ton and effect of rotational masses is 15% of dead weight. If axle load is not to exceed by 20 tonnes, determine the weight of locomotive and number of axles.	[L3][CO5]	**[7M]**
4	a) How the electric traction system is classified? Briefly discuss.	[L1][CO5]	**[5M]**
	b) A train has schedule speed of 30 km/hr over a level track distance between stations being 1 km. Duration of stop is 20 sec. Assuming braking retardation of 3 km/hr/sec and maximum speed 25% greater than average speed, calculate acceleration required to run the service.	[L3][CO5]	**[5M]**
5	A train is to run between two stations 1.6 km apart at an average speed of 40 kmph, the run is to be made to a quadrilateral N-T curve. Maximum speed is to be limited to 64 kmph, acceleration, to 2 kmphps, coasting retardation to 0.16, and braking retardation to 3.2, Determine the duration of a acceleration, coasting and braking periods.	[L3][CO5]	**[10M]**
6	a) Discuss the speed-time curves for urban service.	[L2][CO6]	**[5M]**
	b) A sub urban electric train has a maximum speed of 70 km/hr. The schedule speed including a station stop of 30 sec in 45 km/hr. If the acceleration is 1.5 km/hr/sec. Find the value of retardation when the average distance between stops is 600 m.	[L3][CO6]	**[5M]**
7	Describe how Plugging, Rheostatic braking and Regenerative braking are employed with DC series motor	[L2][CO5]	**[10M]**
8	a) Discuss the speed-time curves for main line services.	[L2][CO6]	**[5M]**
	b) A train has schedule speed of 60 km/hr between the stops which are 6 km apart. Determine the crest speed over the run assuming trapezoidal speed time curve. The train accelerates at 2 km/hr/sec and retards at 3 km/hr/sec. Duration of stops is 60s.	[L3][CO6]	**[5M]**
9	An electric train is to have acceleration and breaking retardation of 0.8 km/hr/sec and 3.2 km/hr/sec respectively. If the ratio of maximum to average speed is 1.3 and time for stop is 26 sec, find the schedule speed for a run of 1.5 km. Assume simplified trapezoidal speed time curve.	[L3][CO6]	**[10M]**

10	With the help of Speed-Time curve, define and explain the importance of following factors in a traction system. a) Notching period. b) Free running period. c) Coasting period. d) Braking period. e) Write any two advantages of electric traction system.	 [L2][CO5] [L2][CO5] [L2][CO5] [L2][CO5] [L2][CO6]	 **[2M]** **[2M]** **[2M]** **[2M]** **[2M]**

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