DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VALUE ADDED COURSES

"ENERGY CONSERVATION, MANAGEMENT AND AUDIT"

QUESTIONS WITH ANSWER KEY

1.Which of the following is more energy efficient?

a) Incandescent Bulb b) Fluorescent Tube light c) **CFL** d) None of these

2.Which of these household electrical appliances consume maximum electricity?

a) **Electric Heater** b)Light Bulb c) Television d)Fan

3.The monthly electricity bill shows number of units consumed in a month. The unit indicates

a) The tax to be paid b**) Energy consumed** c) Supply voltage d)Area of the house

4.Which of the following is an example of Renewable Energy source?

a)Coal b) Petrol c) LPG d) **Wind**

5. Greenhouse gases are those that can absorb and emit infrared radiation. Which of the following is not a green house gas?

a)**Water vapour** b) Carbon Dioxide c) Methane e) Hydrogen

6. Which of the following will generate more light for same wattage?

a) Incandescent bulb b) Conventional tube light c) CFL d) **LED**

7. "Energy Saved is Energy Generated" implies that

a) Energy saved by energy conservation is lost and cannot be recovered
b) Energy requirement is reduced by energy savings
c) **Amount of energy available for use by saving is more than the amount of energy saved**
d) Energy requirement increases by saving energy.

8. The device used to measure light intensity is known as

a**) Lux metre** b)Ampere meter c)Voltmeter d)Galvanometer

9. The device used to measure the wind speed is known as

a) **Anemometer** b) Earth tester c) Wind turbine d) Odometre

10. Which of the following countries has maximum per capita green house gas emission?

a) India b) **China** c) USA d) Japan

11. If machine 'A' delivers output equivalent to 700 watt and takes input power of 1000 watt, machine 'B' delivers output 155 watts and takes input power of 2000 watts, then which machine is more efficient?

a) **Machine A** b) Machine B c) Both A and B d) Cannot be determined

12. The purpose of the cooling system is to _____ .

a**). Keep the fuel at operating temperature**
b). Control waste heat produced by the engine
c). Prevent oil gelling
d). Heat incoming air for combustion

13. What type of lamp is use for car parks?

a). Mercury light
b). Low pressure sodium light
c). **High pressure sodium light**
d). CFL

14. It is a type of lighting used extensively in signage's and utilizes high electrical wattage?

a). Led
b). Panaflex
c). **Metal halide**
d. CFL

15 . What is not part of lightning arrester?

a). Down conductor
b). Earthen material
c). Transmitter
d). Lighting rod

16. A set of light bulbs were connected in series connection. If 1 bulb is going to be removed, what will happen?

a). The remaining light bulbs will still be lighted
b). **The other bulbs in series will go out**
c). The bulbs after the removed bulb will no longer be lighted
d). The bulbs before the removed bulb will no longer be lighted

17. Which one of the following is boiler accessory?

a). safety valves
b).Waterlevel indicator
c).**Economiser**
d).Pressure Gauge

18. What is the primary principle of a fuse?

a). Open the circuit.
b). Protect the appliance.
c). Protect the line.
d). **Prevent excess current from flowing into the line.**

19. When does the circuit breaker operate in the line?

a).When power is to be supplied.
b). When the line is to be tested.
c). Whenever the fault occurs in the line.
d). **Whenever the switch and the relay has to be operated.**

20. What is the advantage of HRC fuses over Rewirable fuses?

a. High speed operation
b. High rupturing capacity
c. No ageing effect.
d. **All of the above**

21. Buchholz relay is which of the following relay

a).**Oil actuated relay**
b). Current actuated relay
c). Gas actuated relay
d). Temperature actuated relay

22. This is the unit of measurement that for measuring electrical pressure or EMF?

a). Switch
b). **Volt**
c). Ampere
d). Electrode

23. Which Indian state is the largest producer of gold?

a) **Karnataka**
b) Kerala
c) Assam
d) Goa

24. Materials that allow energy to flow through them are called

a). Insulators
b). Semiconductors
c). **Conductors**
d). None of the above

25. An atom's "atomic number" tells us how many_____ it has.

a). Protons
b). Neutrons
c). Electrons
d). **Both A and C**

26. Which of these is an output of a 'Furnace'?

a) Fuel gas
b) Air
c) **Flue gases**
d) Water Vapor

27. What kind of energy output is obtained from a 'Steam Power Plant'?

a) Heat energy
b) Sound energy
c) **Electricity**
d) Thermal energy

28. Water that is fed back to the boiler by the pump is called?

a) Adsorbate
b) Absorbate
c) Condenset
d) Condensate

29. The net change in internal energy in a steam power plant is?

a) Positive
b) Negative
c) Zero
d) **None of the mentioned**

30. The components of a Steam Power Plant are?

a) Evaporator, Condenser, Boiler, Expansion valve
b) Evaporator, Condenser, Boiler, Turbine
c**) Boiler, Turbine, Condenser, Pump**
d) Boiler, Turbine, Pump, Expansion valve

31. Shaft work is fed to _____ for getting an electrical output.

a) Motor
b) **Generator**
c) Rotor
d) Accelerator

32. Energy recovery is typically via production of ____

a) Gas
b) Heat
c) Light
d) **Steam**

33.What is the maximum percent of energy recovered if the steam is condensed before reintroduced to system?

a) 25
b) **35**
c) 45
d) 55

34. Which of the following industrial process uses waste as a fuel?

a) Cement kilns
b) **Lead manufacturing**
c) Acid manufacturing
d) Sulphur manufacturing

35. What is the combustion temperature range in cement kiln incineration?

a) 1300-1600
b) 1350-1650
c) **1250-1450**
d) 1235-1600

36. on-volatile heavy metals in kiln are fixed into ____

a) Clinker's crystalline structure
b) Fumes
c) **Solid lump**
d) Slag

37. Which of the following waste types are not suitable for co-combustion in cement kilns?

a) Chlorine
b) Hydrogen
c) **Calcium**
d) Carbonate

38. What is the iron and steel constitute of e-waste?

a) 20
b) 30
c) 40
d)**50**

39. Which of the following element make e-waste hazardous in nature?

a) **Lead**
b) Glass
c) Plastic
d) Iron

40. What is the hazardous pollutant released from electron tubes?

a) **Arsenic**
b) Barium
c) Cobalt
d) Cadmium

41. For voltage boosting in distribution networks the capacitors used is

a) **Series capacitors**
b) Shunt capacitors
c) Both (a) and (b)
d)None of these

42.T o reduce the power consumption, the capacitors should be located

a. **As close as possible to the load**
b. As far as possible to the load
c. Not too close not too far from the load
d. All of these
e. None of these

43. A synchronous motor takes the leading current when it is

a. Overexcited
b. **Under excited**
c. Not excited
d**.** Either (a) or (b)
e. All of these

44. **In order to improve the power factor of equipment operating at lagging power factor, a capacitor is connected**

a. In series with the equipment
b. **In parallel with the equipment**
c. In series-parallel with the equipment
d. Either (a) or (b)

45. **To save energy, Washington DC, has developed an investment analysis software package, ENVEST. This program can be run on an**

a. IBM PC
b. PCXT
c. PCAT
d**. All of these**

46. **The secondary distribution transformer is generally**

a. Star connected
b. Star connected with the secondary delta connected
c. Delta connected with the secondary star connected
d. **Delta connected**

47. **The conversion factor for the standard power rating motor is equal to**

a. 0.735
b**. 0.746**
c. 0.748
d. 0.756

48. **The ratio of average load over a designated period to the peak load demand occurring in that period is known as**

a. power factor
b. ratchet rate
c. load factor
d. **production factor**

49. **The production factor is defined as the ratio of**

a. current year production to the reference year production
b. current year production to the reference month production
c. reference month production to the current month production
d. **reference year production to the current year production**

50. **The reactive power component kVAR is equal to the**

a. kVA sinØ
b. kW tanØ
c. kW cosØ
d. Both (a) and (b)
e. None of these

51. **The efficiency of variable speed drives generally**

a. Decreases with speed
b. Increases with speed
c. **Remains constant with change in speed**
d. None of these

52. **The basic function of electronic ballast is**

a. To ignite the lamp
b. **To stabilize the gas discharge**

c. To supply the power to the lamp
d. Only a and c
e. All of these.

53.**The rotational speed of an AC induction motor depends on the**

a. Number of poles in stator
b. Frequency of the applied AC power
c. **Both a and b**
d. None of these

54. **A conventional incandescent lamp has a luminous efficiency of**

a. 10 lumens / watt
b. 12 lumens / watt
c. 14 lumens / watt
d. 14.6 lumens / watt

55. **The monitor and control of energy management system is done by using**

a. MATLAB
b. **SCADA**
c. AUTO - CAED
d. All of these
e**.** None of these

56. **The energy strategies of companies have the principle of**

a. restoring and preserving the environment
b. reducing wastes and pollutants
c. educating the people about energy conservation
d**. all of these**
e. none of these

57. **The water pollution prevention and control act was formed in the year**

a. 1986
b. 1974
c. 1981
d. 1980

58. **The Indian electricity rules of 1956 cover**

a. Inspections of electric installations
b. Licensing
c. General safety precautions
d. Only b and c
e. All of these

59. **Energy conservation act was formed in the year**

a. 1998
b. 1999
c. 2000
d. 2001

60. **The rules of a particular electricity supply system provision for metering, earthing and for other installation matters are in accordance with the electricity supply act of**

a. 1947
b**. 1948**

c. 1956
d. 1958

61. **Which among the following is not the pronged approach to energy management?**
a. Capacity utilization
b. Fine turning of equipment
c. Technology up gradation
d. All of these
e. None of these

62. **Phase advancers are used to improve the power factor of**
a. Induction motors
b. Induction generators
c. Synchronous motors
d. Synchronous generators

63. **Power factor of a load can be improved by using**
a. Static capacitors
b. Synchronous condenser
c. Phase advancer
d. Only a and b
e. All of the above

64. **If power factor is less than unity then it will result in**
a. Large kVA rating of equipment
b. Greater conductor size
c. Large copper losses
d. Only A and C
e. All of these

65. **The current flowing through the resistance is given by**
a. **I cosØ**
b. I sinØ
c. I tanØ
d. I cotØ

66. **Reactive power is measured in terms of**
a. kW
b. kVA
c. **kVAR**
d. None of these

67. **Power factor is the ratio of**
a. **Active power to the reactive power**
b. Active power to the apparent power
c. Apparent power to the active power
d. Reactive power to the apparent power

68. **The electric power from primary distribution line is delivered to distribution substations by using**
a. 1 phase wire
b. 3 phase, 3 wire
c. 3 phase, 4 wire
d. All of these

e. None of these

69. **The demand side management can be achieved by the technique of**

a. Time of day pricing and metering
b. Multi - utility power exchange model
c. **Load management**
d. All of these
e. None of these

70. **Demand Side Management is required to**

a. Reduce overall cost of installed capacity
b. Reduce needs for peaking stations
c. **Ensure quality and equity of supply**
d. Only B and C
e. All of these

71. **Maximum demand charges are given in**

a. **kWh**
b. kVA
c. kVAr
d. All of these
e. None of these

72. A load curve is a plot of

a. Load versus generation capacity
b. Load versus current
c. Load versus time
d. Load versus cost of power

73. **For economy in generation power**

a.diversity factor should be high
b.plant utilization factor
c.load factor should be high
d. load factor and diversity factor should be low.

74. Which of the following category of consumers can provide highest load factor ?

a. A domestic consumer
b.A continuous process plant
c. A steel melting unit using arc furnace
d. A cold storage plant.

75. The load of a consumer is generally measured in terms of

a.Volts
b.Amperes
c. Ampere hour
d. kW.

76. The normal connected load of a domestic consumer is usually

a. Up to 10 kW
b. 10 to 20 kW

c. 25 to 50 kW
d. 50 to 100 kW.

77. Load factor during a period is

a.Average Load / Installed Capacity
b. Average Load / Maximum Load
c. Maximum Load / Average Load
d. Maximum Load / Installed Capacity.

78. Which of the following installation provides peaked load ?

a. Arc furnace
b. Air conditioner
c. Air compressor running continuously
d.Cold storage plant.

79. Demand factor is the

a. Maximum Demand / Average Demand
b. Maximum Demand / Connected Load
c. Average Demand / Maximum Demand
d. Connected Load / Maximum Demand.

80. During summer months the increased load is due to

a. increased water supply
b. vacations in institutions
c. increased business activity
d. increased use of fans and air conditioners.

81. In a system if the base load is the same as the maximum demand, the load factor will be

a. 1
b. Zero
c. Infinity
d. 1 percent.

82. A system having connected load of 100 kW, peak load of 80 kW. base load of 20 kW and average load of 40 kW, will have a load factor of

a. 40%
b. 50%
c. 60%
d. 80%.

83. Load due to a ceiling fans is nearly

a. 10W
b. 40 to 50 W
c. 100 to 200 W
d. 250 W to 2000 W.

84. Which domestic utility item has highest power rating ?

a. Refrigerator
b. Ceiling fan

c. Tube light

d. Electric iron.

85. If field current is decreased in shunt dc motor, the speed of the motor

a. remains same.

b. increases.

c. **decreases.**

d. none of the above.

86. What is the mechanical power developed by a DC series motor is maximum?

a. Back emf is equal to half the applied voltage

b**. Back emf is equal to applied voltage**.

c. Back emf is equal to zero.

d. None of above.

87. What is the shunt resistance component equivalent circuit obtained by no load test of an induction motor representative of ?

a. windage and friction loss

b. core loss only

c. **both 1 and 2**

d. Copper loss

88. The emf induced in the dc generator armature winding is

a. **AC**

b. DC

c. AC and DC

d. None of the above

89. Commutator in DC generator is used for

a. collecting of current

b. reduce losses

c. increase efficiency

d. **convert AC armature current in to DC**

90. In DC machine yoke offers

a. **mechanical protection to the machine**

b. flux path completion

c. produce working flux

d. both A and B

91. In DC generators brushes are used for

a.**collecting of current without any sparkings**

b.collecting of voltage

c.reduce eddy current loss

d.convert ac armature current in to dc

92. Which of the following windings are necessary in case of all dc machines?

a. closed winding

b. **lap winding**

c. wave winding

d. open type winding

93. DC machine windings are

a. full pitched

b. **short piched**

c. either of these

d. none of the above

94. In a dc machine 4 pole lap winding is used. The number of parallel paths are?

a.2

b**.4**

c.1

d.8

95. In a dc machine 6 pole wave winding is used. The number of parallel paths are?

a.6

b.4

c**.2**

d.1

96. Open cooling system is also called as _____

a. parallel system

b. **once through system**

c. air based system

d. non-reversible system

97. How many number of spray nozzle does each module on spray pond cooling system contains?

a.1

b. **2**

c. 3

d. 4

98. Which of the following is the simplest method of cooling the condenser water?

a. **Spray cooling pond**

b. Cooling tower

c. Indirect air cooling

d. Hyperbolic cooling tower

99. Select the disadvantage of cooling pond out of the given?

a. The area required of cooling in a cooling pond is small

b. Spray losses due to evaporation and windage run high

c. **There is no control over the temperature of cooled water**

d. The cooling efficiency is low compared with cooling water

100. How is air produced in mechanical draught cooling tower?

a. Air Tuyeres

b. **Propeller fans**

c. Air blowers

d. Louvre