International All Other Countries

Study Guide Topics

Energy Auditing Overview
- Introduction to energy auditor skills
- Common audit shortcomings
- The need for Certified Energy Auditors

Energy Fundamentals
- Energy and power
- Forms of energy
- Unit conversions
- Energy bill components
- Point of use cost

Audit Process
- Energy balance
- Benchmarking analysis
- Level 0 - Preliminary energy use analysis
- ASHRAE level 1 audits
- ASHRAE level 2 audits
- ASHRAE level 3 audits
- Investment grade audit basics
- Investment grade audit contract
- Other type of audits
- Data collection forms

Auditing Tools and Computer Software
- Safety considerations
- Energy audit instrumentation
- Metering and sub-metering
- Free and proprietary software tools (EZSim, HAP, Energy Plus, MotorMaster+, QuickCalc, RETScreen)

Understanding Electrical Energy Systems
- DC, AC, Single & 3-phase power
- Star and Delta connections
- Resistive and inductive loads
- Power Factor and Power Factor Correction

- Electric motors
- Voltage imbalance
- Energy efficient motors
- Variable Speed Drives
- Harmonics
- Single phase motors
- Lighting
- Lighting quality and lighting quantity considerations
- Types of light sources
- Ballasts
- Lighting maintenance
- Lighting control

Understanding Thermal Systems
- Heat transfer
- Heat flow calculations
- Degree-days
- Insulation
- The psychrometric chart
- Refrigeration
- The vapour compression cycle
- Pressure enthalpy diagram
- HVAC performance measures
- Absorption chillers
- Air conditioning system types
- Boilers and steam systems
- Boiler fuel types
- Boiler types
- Combustion efficiency
- Steam leaks
- Heat recovery

Understanding Mechanical Energy Systems
- Affinity laws
- Pump systems
- Pump and system curves
- Gas-engine driven chillers
- Compressed air systems
- Components (after-coolers, receivers, dryers, distribution, condensate drain traps)
- Artificial demand
- Compressed air leakages
- Multiple compressor control
- Transport energy
- Transport energy improvement opportunities

Economic Analysis and Economic Decisions for Energy Projects
- Economic analysis (simple payback, MARR, NPV, IRR, SIR, present worth)
- Life cycle costing
- Economic examples and problems
- Case studies

Controls and Web-Based Energy Information Systems
- Types of controls
- Control technologies
- Control algorithms
- Building Management Systems
- DDC Control
- Building EIS
- Building Automation Systems
- Maintenance and commissioning

Data Analysis
- Fixed versus variable energy use
- Regression analysis
- Drivers of energy use
- CUSUM

Assessment of Performance
- Energy performance
- Energy Performance Indicator (EnPI)
- Current consumption, efficiency, and end use
- Significant Energy Use (SEU)

Alternative Financing and Measurement and Verification (M&V)
- Energy Management Project financing options
- Energy Saving Performance Contracting (ESPC)
- M&V process
- IPMVP
- M&V measurement methods
- Baseline adjustments
- Routine and non-routine adjustments

Management of the Audit Process
- Resources, competence, time management, communications

Writing Successful Audit Reports
- Report structure
- Techniques for effective report-writing
- Presenting the report

The Certification Exam

The applicant must complete a four-hour exam. The examination questions are based on concepts and experiences basic to energy auditing, on recognized tests, and on supplemental reading. **The exam is Open Book!** Because of the diversity of background and experience of Energy Auditors, the examination has 8 different subject sections, all of which are mandatory. The exam consists of multiple choice and true/false questions.

Body of Knowledge	Percent of
Energy Audits and Instrumentation	19 – 21 %
Energy Fundamentals and Energy Accounting	12 – 14 %
Economic Analysis of Energy Conservation Measures; Financing Energy Projects; Performance Contracting; and Measurement and Verification	9 – 11 %
Building Systems, Lighting, HVAC, Chillers	14 – 16 %
Controls, Control Systems; Building Automation Systems; and Facility Electrical Systems	7 – 9 %
Motors and Drives	10 – 12 %
Boilers, Steam Systems, Compressed Air Systems, and Industrial Processes	7 – 9 %
Operations and Maintenance	14 – 16 %

Practice Questions

Q1 Maximum demand of electricity used in industry as shown in a monthly utility electricity bill is the

a) instantaneous highest kVA recorded during any point of time within the month
b) average kVA recorded within the month
c) highest average kVA recorded during any one-demand interval within the month
d) none of the above

Q2 A 230V, 100 W rated incandescent bulb is operated at a constant voltage of 250V. The approximate power consumption of bulb is

a) 100 W
b) 118 W
c) 85 W
d) none of the above

Q3 Heat which, when added or subtracted does not results in a change of temperature is called as

a) sensible heat
b) latent heat
c) specific heat
d) heat capacity

Q4 A three phase induction motor is drawing 10 Ampere at 400 Volts. If the operating power factor of the motor is 0.85 and the motor efficiency is 90%, then the mechanical shaft power output of the motor is

a) 5.88 kW
b) 6.9 kW
c) 5.3 kW
d) none of the above

Q5 Which one is the key element for successful Energy Management?

a) training
b) planning
c) monitoring
d) top management support

Q6 Which of the following is not likely to create harmonics in an electrical system

a) soft starters
b) variable frequency drives
c) UPS
d) induction motors

Q7 An organization while establishing energy management system, need to

a) appoint energy manager
b) form a dedicated energy team
c) institute an energy policy
d) all the above

Q8 For a successful energy project the ROI must always be ___ than interest rate

a) lower
b) equal
c) higher
d) lower or equal

Q9 The ratio of energy consumption to corresponding production quantity is called

a) energy performance
b) production factor
c) specific energy consumption
d) specific production ratio

Q10 Changing from Fuel Oil firing to natural gas firing will typically result in

a) increased CO_2 emissions
b) decreased SO_2 emissions
c) decreased % of wet flue gas loss
d) none of the above

Q11 A gas fired water heater heats water flowing at the rate of 5 litres per minute from 20oC to 75oC. If the GCV of the gas is 4x107 J/kg, what is the rate of combustion of gas in g/min (Assume efficiency of water heater= 60%, density of water =1000 kg/ m3, specific heat of water= 4.2x103 J/kg/oC)

a) 29
b) 150
c) 48
d) 80

Q12 A drilling machine drawing continuously 5kW of input power and with an efficiency of 50%, is used in drilling a bore in an aluminum block of 5kg of mass. How much will be the rise in temperature of the block at the end of 100 seconds. Assume 20% of the energy imparted to the block is lost to surroundings and the balance is absorbed by the block in its uniform heating, and the specific heat of aluminum block = 900 J/kg/degree K (approx.)

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

Q13 With increase in excess air for combustion which of the following will result in flue gas

a) % Oxygen decreases
b) % CO_2 decreases
c) % Oxygen and CO_2 decreases
d) % Oxygen and CO_2 increases

Q14 For a four pole induction motor operating at 50 Hz, the slip at a shaft speed of 1450 RPM will be

a) 3.33%
b) 0%
c) 0.33%
d) none of the above

Q15 De-aeration in boiler removes

a) CO_2 in flue gas
b) O_2 in feed water
c) O_2 in fuel
d) O_2 in flue gas

Q16 In pure stoichiometric combustion of furnace oil which of the following will be absent in flue gas?

a) nitrogen
b) carbon dioxide
c) oxygen
d) sulphur dioxide

Q17 Turndown ratio" for burners is the ratio of

a) air to fuel
b) maximum fuel input to actual fuel input
c) maximum fuel input over minimum fuel input
d) maximum air input over minimum air input

Q18 De-aeration of boiler feed water helps in combating

a) corrosion
B) TDS
c) silica
d) hardness

Q19 Improving power factor at motor terminals in a factory will

a) increase active power
b) release distribution transformer capacity
c) reduce contract demand
d) increase motor efficiency

Q20 For a two pole induction motor operating at 55 Hz, the slip at a shaft speed of 2995 RPM will be

a) 0.1%
b) 1%
c) 9.2%
d) none of the above

Q21 A three phase induction motor loaded at less than 50% if operated in star mode, will result in

a) reduced operating voltage
b) electrical downsizing of the motor
c) improved efficiency and power factor
d) all of the above

Q22 An induction motor rated for 75 kW and 90% efficiency, operating at full load, will

a) deliver 83.3 kW
b) deliver 75 kW
c) draw 75 kW
d) draw 67.5 kW

Q23 An air dryer in a compressed air system
a) reduces dew point of air
b) increases dew point of air
c) reduces work of compression
d) none of the above

Q24 Which of the following can also act as a heat pump?
a) centrifugal pump
b) centrifugal compressor
c) air conditioner
d) none of the above

Q25 Partially closing the outlet damper in a fan system will
a) reduce flow
b) increase power consumption
c) reduce fan static pressure
d) all of the above

Q26 Which of the following flow controls in the fan system will change the system resistance curve?
a) Magnetic clutch drive
b) speed change with variable frequency drive
c) Three speed motor
d) discharge damper

Q27 Parallel operation of two identical fans in a ducted system will
a) double the flow
b) double the fan static pressure
c) not double the flow
d) increase flow by more than two times

Q28 A fan handling air in a ducted system is an example of
a) pure friction (dynamic) head
b) pure static head
c) combination of static and friction head
d) none of the above

Q29 The efficiency of a pump does not depend on
a) suction head
b) discharge head
c) density of fluid
d) motor efficiency

Q 30 Which of the following is not a gas discharge lamp?

a) fluorescent tube lamp
b) mercury vapour lamp
c) metal halide lamp
d) incandescent lamp

Q31 Which of the following is not a gas discharge lamp?

a) fluorescent tube lamp
b) LED
c) metal halide lamp
d) High Pressure Sodium lamp

Q32 A system has a static head of 45 meters and dynamic head of 5 meters and a flow of 30LPM the centrifugal pump is operating at 1440 RPM. The pump speed is reduced to 1100 RPM. What is likely to happen as a result of this?

a) Flow reduced by about 23%
b) Flow increased by about 23%
c) Flow reduced by about 41%
d) No flow

Q33 A three phase induction motor is drawing 12 amperes at 440 volts. If the operating power factor is 0.80, then the power drawn by the motor is

a) 7.3 kW
b) 4.224 kW
c) 6.1 kW
d) 9.5 kW

Q34 Air velocity in ducts cannot be measured by using an ___

a) Bourden gauge
b) Pitot tube
c) Anemometer

Q35 What type of steam is used for electric power generation in thermal power plants?

a) Dry saturated
b) High pressure with superheat
c) Wet steam
d) None of the above

Q36 In a glass industry waste heat is used for power generation. This type of cogeneration is called

a) topping cycle
b) bottoming cycle
c) gas turbine cycle
d) reheat cycle

Q37 Flash steam can be recovered from
a) leaking steam
b) condensate at vacuum
c) condensate at high pressure
d) condensate at atmospheric pressure

Q38 Radiation losses from a boiler are practically
a) increase with increase in its % loading
b) decrease with increase in its % loading
c) are independent of its % loading
d) none of the above

Q39 A 22 kW rated 3 phase induction motor operating at 405 V and drawing 18 kW, 32 amperes will be operating at a power factor of
a) 0.98
b) 0.86
c) 0.8
d) none of the above

Q40 The purpose of an inter cooler in a reciprocating compressor is to
a) remove the moisture in the air
b) reduce the temperature of the air before it enters the next stage
c) separate moisture and oil vapour
d) none of the above

Q41 Higher chiller COP can be achieved with
a) higher evaporator temperature and higher condensing temperature
b) lower evaporator temperature and higher condensing temperature
c) lower evaporator temperature and lower condensing temperature
d) higher evaporator temperature and lower condensing temperature

Q42 The COP of a vapour compression system is 3.5. If the motor draws power of 10.8 kW at 90% motor efficiency, the cooling effect of vapour compression system will be
a) 34 kW
b) 37.8 kW
c) 0.36 kW
d) none of the above

Q43 A centrifugal pump is delivering 200 m3/hr. The impeller diameter is trimmed by 10%. The new flow (m3/hr.) will be
a) 222
b) 200
c) 180
d) 162

Q44 A centrifugal pump is operating at 1440 RPM. If the power is to be reduced to 75% of the existing power the speed of the pump as per affinity law will be

a) 1308 RPM
b) 1080 RPM
c) 360 RPM
d) none of the above

Q45 In case of parallel operation of pumps, select the wrong statement:

a) The system curve is usually not affected by the number of pumps that are running in parallel
b) For a system with a combination of static and friction head loss, the operating point of the pumps on their performance curves moves to a higher head
c) For a system with a combination of static and friction head loss, the flow rate with two pumps running is double that of a single pump
d) If the system head were only static, then flow rate would be proportional to the number of pumps operating

Q46 Either a Bourdon gauge or a Pitot Tube can be used to measure air velocity.

a) True
b) False

Q47 The position of a thermocouple probe makes a big difference in the temperature readings that can be obtained.

a) True
b) False

Q48 A very good estimate of the real temperature of an object can be found from its emitted radiation.

a) True
b) False

Q49 Which instrument is used to measure relative humidity?

a) Psychrometer
b) Ammeter
c) Thermometer
d) Anemometer

Q50 What instrument would you commonly used to measure the current in an AC circuit?

a) Ohmmeter
b) Ampmeter or ammeter
c) Wattmeter
d) None of the above

Q51 The steam boiler for a facility can operate on LPG gas or oil. Using LPG gas at €1.25 per kg and 45,650 kJ/kg, the boiler is 75% efficient. Using diesel oil at €1.00/L and 39,000 kJ/L, the boiler is 78% efficient. Which fuel source provides the lowest operating cost?

a) Oil
b) LPG

Q52 An office building has 10,000 square metres of conditioned floor space and uses 2.0 million kWh and 6800 GJ of natural gas in one year. What is its energy usage index?

a) 1400 MJ/m2
b) 1800 MJ/m2 c
c) 250 MJ/m2
d) 1800MJ/m2

Q53 A vendor proposes a retrofit lighting system. The system will cost €100,000 installed; but it will save €15,000 per year for the next 10 years. Your minimum attractive rate of return (interest rate) is 10%. Calculate the present worth of the cash flow?

a) (€7831)
b) €7831
c) €50000
d) €20000

Q54 A heat wheel can be installed on your exhaust air system to preheat the make-up air. The installed cost is €15,000 and the unit has an economic life of 10 years. How much must it save each year to return 15%?

a) €3154
b) €2989
c) €3784
d) €3621

Q55 A de-superheater can be installed on your refrigerator system to obtain free hot water. You estimate you can heat 150,000 litres of water per year from 15°C (city water entering temperature) to 60°C. This will replace a natural gas water heater that operates at 80% efficiency. You pay €0.05 per kWh for your gas. The unit has an economic life of 5 years. How much can you pay for that unit and obtain a return of 12%?

a) €3800
b) €5312
c) €2432
d) €1774

Q56 A facility has a motor that draws 200 kVA and has a power factor (Cos phi) of 0.707. How many kW does it draw?

a) 141.4 kW
b) 158.6 kW
c) 186.2kW
d) 192 kW

Q57 A facility has a motor that draws 200 kVA and has a power factor (Cos phi) of 0.80. How many kVAr does it draw?

a) 150 kVAr
b) 200 kVAr
c) 160kVAr
d) 120 kVAr

Q58 A 30 kW cooling roof top A/C unit has an EER of 7.2. What is its kW input load at full capacity?

a) 7.2
b) 4.2
c) 3.6
d) 2

Q59 A 30 kW cooling roof top A/C unit has an EER of 8.5. What is its COP?

a) 3.5
b) 2.36
c) 8.5
d) 2

Q60 A 30 kW cooling roof top A/C unit has an EER of 8.5. What is its kW input load at full capacity?

a) 12.7
b) 2.36
c) 8.5
d) 8.33

Q61 In a vapor compression cycle air conditioner, the refrigerant is always in the vapor state.

a) True
b) False

Q62 Reheat may still be needed in an HVAC system even if the outside temperature is very high.

a) True
b) False

Q63 Air at 20oC dry bulb and 50% relative humidity flows at 3200 LPS and is heated to 32oC dry bulb and humidified to 40% RH. Approximately how many kW is required in this process?

a) 61 kW
b) 96 kW
c) 183 kW
d) 351 kW

Q64 How many j/s of air conditioning is required to cool 500 LPS of air at 32°C and 60% relative humidity (RH) to 15°C and 100% RH?

a) 21,600
b) 77,760
c) 6000
d) 47000

Q65 The efficacy of a light source refers to the color rendering index of the lamp.

a) True
b) False

Q66 A 1000 square metre building consumes the following amounts of energy per year. What is the Energy Use Index in MJ per square metre per year? Natural Gas 500 GJ/year Electricity 60,000 kwh/year

a) 716 MJ/ m2 /yr
b) 883 MJ/m2 /yr
c) 8150 MJ/m2 /yr
d) 17,500 MJ/m2 /yr (E) 70,000 MJ/m2 /yr

Q67 An energy saving device will save $25,000 per year for 8 years. How much can a company pay for this device if the interest rate (discount rate) is 15%?

a) $112,180
b) $53,590
c) $76,451
d) $178,420

Q68. An energy saving device costs $34,500 and will save $9,000 per year for its full life of 8 years. What is the approximate internal rate of return?

a) 10%
b) 12%
c) 15%
d) 20%
e) 25%

Q69. A new device costs $40,000 installed. The device will last 10 years at which time it will have to be replaced. How much will it have to save each year to obtain a 15% internal rate of return before taxes?

a) $4,600
b) $6,450
c) $7,970
d) $9,460

Q70. An audit for one facility showed that the cos φ is almost always 70% and that the demand is 1000 kW. What capacitor size is needed to correct cos φ to 90%?

a) 266 kvar
b) 536 kvar
c) 1,000 kvar
d) 618 kvar
e) 1,214 kvar

Q71 Estimate the seasonal energy consumption for a building if its design heating load has been determined to be 105 kW for a design temperature difference of 30°C if the heating season has 1,800 degree days. The heating unit efficiency is 80%.

a) 700.0 GJ/yr
b) 350.1 GJ/yr
c) 462.2 GJ/yr
d) 720.6 GJ/yr
e) 680.4 GJ/yr

Q72 When a large insurance call center has an unmanned server room, it produces 340,000 kJ per hour of heat from equipment and lights. How many kW of air conditioning is needed just to remove this heat from the equipment and lights?

a) 17.13 kW
b) 44.70 kW
c) 94.44 kW
d) 134.37 kW
e) 189.29 kW

Q73 Which of the following most likely provides a more detailed level of savings achievable from energy savings projects?

a) Level 1 audit
b) Level 2 audit
c) Walkthrough audit

Q74 Which of the following will likely take longer to deliver in a facility

a) Level 2 audit
b) IGA Audit

Q75 A commercial office building has a total of 65 kW of lighting controlled manually and typically on all day long. The lighting consists of the following 5 kW of incandescent/ tungsten halogen lighting; 60 kW of fluorescent lighting; 10 kW Induction lighting. How much of the lighting electrical load is delivered as heat to the building?

a) Approx 5 kW
b) Approx 25 kW
c) Approx 60 kW
d) Approx 65 kW

Solutions

1 C
2 B *P = V x I = V2/R so 100 = 230 x 230 / R meaning that R = 529.*
With V = 250 the new power becomes P = 250x 250/ 529 = 118.14W
3 B
4 C *P (elec) = $\sqrt{3} x V x I x Cos\emptyset$=1.732 x 400 x 10 x 0.85=5888.8*
P (mech) = P (elec) x efficiency = 5888 8x 0.9 = 5300W = 5.3 kW
5 D
6 D *Harmonics are caused by non-sinusoidal currents. Induction motors are not a cause of these.*
7 D
8 C
9 C
10 B *FO contains Sulphur, typically more efficiently burnt than gas and gas gives moisture when combusted*
11 C *5 L/min means 5kg/ min. Q = 5kG x 4.2 kj x 55deg x10.6 = 1925 kj/ min of gas But gas has 4 x 107 kg so be burn 1925000/ (4 x 107) = 0.048128 kg = 48g/ min*
12 B *Input to drill is 5kW, drill 50% efficient means 2.5kW energy into block but 20% lost to exterior so 2 kW additional heat added for a 5 kg block. 1W = 1j/s meaning that adding energy at 2kW means 2000j/s of net energy increase for 5kg block or 400j/kg. for 100 sec meaning that we add 40000J of energy. But aluminum has SHC of 900j/kg/oC so 40000/900 = 44.44oC*
13 B *Follow on combustion chart*
14 A *50/1500 = 3.33%*
15 B
16 C
17 C
18 A
19 B

20 C *2 Pole motor. Mag speed rotates at 60 x F/1 = 60 x 55 = 3300. Speed is 2995 so slip = 305. 305/ 3300 = 0.092 = 9.2%*

21 D

22 B

23 A

24 C

25 A

26 D

27 C

28 A

29 D

30 D

31 B

32 D *When the motor speed is reduced it will reduce the head against which it is able to pump and looking at the head, most is static so pump will be dead headed at lower speed.*

33 A

34 A

35 B

36 B

37 C

38 C $\sqrt{3}x\ 405\ x\ 32\ cos\emptyset = 18000\ \ So\ cos\emptyset = \frac{18}{22447} = 0.8$

39 C

40 B

41 D *Higher COP comes from reducing temp difference (pressure difference) across compressor*

42 A *Input to motor is 10.8 kW, input to compressor = 0.9 x 10.8 = 9.72 kW. COP = 3.5 meaning cooling = 3.5 x 9.72 = 34.02 kW*

43 C *200 x 0.9 = 180*

44 A $\sqrt[3]{0.75} = 0.9\ so$ *new speed = 0.9 old speed = 0.908 x 1440 = 1308 rpm*

45 C

46 B

47 A

48 A

49 A

50 B

51 A $\frac{€1.25}{kg}$ x $\frac{1kg}{45{,}650kj}$ x $\frac{1000kj}{Mj}$ x $\frac{1000MJ}{GJ}$ x $\frac{1}{0.75}$ = $\frac{€36.50}{GJ}$
x $\frac{1L}{39000kJ}$ x $\frac{1000kj}{Mj}$ x $\frac{1000MJ}{GJ}$ x $\frac{1}{0.78}$ = $\frac{€32.87}{GJ}$

52 A *2.0 million kWh = 7.2 million MJ = =7200000 MJ 6800GJ = 6800000 MJ Total 14,000,000 MJ = 1400 MJ/M^2*

53 A *Table P/A, 10%, 10 yrs is 6.1446. so. €100000 – (6.1226 x €15000) = € (7831)*

54 B *Table A/P, 15%, 10 yrs is 0.1993 So. €15,000 x 0.1993 = €2989.5*

55 D *First heat required to heat the water is 150000kg x 4.2 x 45 = 28,350,000 kJ = 28,350 MJ = 7875 kWh but efficiency is 80% so we need 7875/0.8 = 9843.75 kWh = €492 Table P/A, 12%, 5 yrs is 3.6048. so we can spend 3.6048 x €492 = €1773*

56 A *200 x 0.707 = 141.4*

57 D *Cosø = 0.8 so ø = 36.87 degrees so Sin ø = 0.6 0.6 x 200 = 120*

58 D *COP = EER/3.6 = 7.2/3.6 = 2*

59 B *COP = EER/3.6 = 8.5/3.6 = 2.36*

60 A *kW in / kW cooling = 3.6/ EER so kWin = 3.6 x 30kW/ 8.5 = 12.7*

61 B

62 A

63 B *H1 = 38.5 H2 = 63 so 3200 x 1.2 x (63 – 38.5) = 94,080 W Answer is not exact because it depends on how you read chart enthalpy*

64 A *H1 = 78 H2 = 42 so 500 x 1.2 x (78 – 42) = 21,600 W*

65 B

66 A *500 GJ is 500,000 MJ, 60,000 kWh is 60,000 x 3.6 MJ = 216,000 MJ so total 716,000 MJ or 716 MJ/M^2*

67 A *Table P/A, 15%, 8 yrs is 4.4873. so we can spend. €25,000 x 4.4873 = € 112,182.50 Answer not exact - depends on how many decimal places used in calculation*

68 D *€34,500/ €9000 = 3.83333. Search table to find at what % P/A, X%, 8 years = 3.8333 or closest*

69 C *Table A/P, 15%, 10 yrs is 0.1993 0.1993 x €40,000 = € 7972*

70 B *Table factor 0.7 to 0.9 is 0.536. 0.536 x 1000 = 536*

71 E *Q = UA dt. 105kW = UA x 30 so UA = 105/30 = 3.5. Now using Q = UA DD x 24 kWh we get Q = 3.5 x 1800 x 24 = 151,200 kWh = 151,200 x 3.6 MJ = 544,320 MJ or 544.32 GJ. But the heating unit is 80% efficient so seasonal energy consumption is 544.32GJ/0.8 = 680.4 GJ*

72 C *340,000 kJ/ hr =340,000/ (60 x 60) kJ/s = 94.44 kJ/s = 94.44 kW*

73 B

74 B

75 D