



PHOTOVOLTAIC SYSTEMS 1
5265

JUNE XXXX

INTERMEDIATE LEVEL

Centre No. & Name	
Candidate No.	
Candidate Name	

Mobile phones are **NOT** allowed in the examination room.

5265 PHOTOVOLTAIC SYSTEMS 1: MULTIPLE CHOICE QUESTION PAPER

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed “**Intermediate Level – 5265 PHOTOVOLTAIC SYSTEMS 1.**”
4. Insert the information required in the spaces above.
5. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.

Take care that you do not erase or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination:

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.
For example, if **C** is your correct answer, mark **C** as shown below:

[A] [B] [C] [D]
8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. **You must not take this booklet and the answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.**

Turn Over

Turn Over

1. A semiconductor is a material
 - A Whose electrical conductivity is like that of a good conductor
 - B Made to resist completely the flow of electrons
 - C That partially allows current to go through it
 - D Whose electrical conductivity is like that of an insulator

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2. Which of the following is a semiconductor used for photovoltaic cell production

- A Silicon
- B Phosphorus
- C Carbon
- D Argon

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3. Which of the following is true about electrons

- A Electrons flow from positive terminal to the negative terminal
- B Electrons flow from negative terminal to positive terminal
- C Electrons are stagnant
- D Electrons movement cannot generate electricity

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4. A photovoltaic cell generates a kind of current that is described as

- A Unidirectional current
- B Alternating current
- C Alternating variable constant current
- D Pulsating current

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5. A solar panel is described as

- A A device that reflects electrical signal on surface
- B An assembly of photovoltaic solar cells
- C A device used in converging light rays
- D A device used in storing electrical energy

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6. The watt hour per square meter (Whm^{-2}) is a unit for

- A Solar irradiance
- B Solar irradiation
- C Solar conductivity
- D Solar thermal factor

7. Solar panels connected in series gives a

- A Greater output voltage
- B Lesser output voltage
- C Greater output current
- D Lesser output current

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8. Solar panels connected in parallel gives a

- A Greater output voltage
- B Lesser output voltage
- C Greater output current
- D Lesser output current

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9. When two batteries are connected in parallel, it should be ensured that

- A They have same voltage rating
- B They have the same mark
- C They have the same ampere hour capacity
- D They have identical internal resistance

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10. Solar radiation flux is usually measured with the help of a

- A Anemometer
- B Pyranometer
- C Sunshine recorder
- D Hydrometer

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11. Reflector mirrors used for exploiting the solar energy are called

- A Heliostats
- B Ponds
- C Diffusers
- D Collector

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12. The function of a solar collector is to convert solar energy into

- A Radiations
- B Electrical energy
- C Thermal energy
- D Kinetic energy

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13. When the source of light is not sun light then the photo voltaic cell is used as

- A Photo diode
- B Photovoltaic cell
- C Photo detector
- D Photo transmitter

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14. The region where the electrons and holes diffuse across the junction is called

- A Depletion Junction
- B Depletion region
- C Depletion space
- D Depletion boundary

15. A pyrometer is used for the measurements of

- A Both direct and diffused radiations
- B Direct radiations only
- C Diffuse radiations only
- D Indirect radiations

16. A PV panel is

- A Photovoltaic cells connected together in series/parallel
- B Photovoltaic cells connected together in series
- C Photovoltaic cells connected together in parallel
- D A photovoltaic cell

17. The angle made by the plane surface with the horizontal is known as

- A Latitude
- B Declination
- C Surface azimuth angle
- D Slope

18. The hour angle is equivalent to

- A 10° per hour
- B 25° per hour
- C 20° per hour
- D 15° per hour

19. Solar panel in shade enables

- A More voltage is generated in the PV cells
- B More current is generated
- C More light strikes the PV cells
- D Less current is generated in PV cells

20. Improving the efficiency of a PV module can be done by

- A Adjusting the PV module to face the sun all day
- B Placing colored acetates on the PV module
- C Heating the solar module
- D Shading the PV module

21. Solar energy is a preferable alternative to fossil fuels because

- A They are pollution and noise free
- B They release toxic gases into the atmosphere
- C They are expensive to run
- D They have high cost of maintenance

22. In a series connection of solar panel

- A The positive terminal is connected to the positive terminal
- B The negative terminal is connected to the negative terminal
- C The positive terminal is connected to the negative terminal
- D Positive terminal is connected to ground

23. One of the following factors affect the output of a solar panel

- A Type of charge controller
- B Cloud cover
- C Type of battery
- D Type of inverter

24. A good reason for large cable sizes in battery interconnections is to

- A To minimize losses in the cables
- B Protect the battery from overcharge/overdischarge
- C Allow for increases in load size or array size
- D Better secure the batteries in case of high winds

25. The function of an inverter is to

- A Convert D.C voltage to A.C voltage
- B Convert A.C voltage to D.C voltage
- C Convert D.C voltage to D.C voltage
- D Convert A.C voltage to A.C voltage

26. One the following is a solar panel characteristics

- A The short circuit current
- B Ampere hour
- C Watt hour
- D Depth of discharge

27. A solar system is desired to produce 48V, 800Ah. How many 12V, 200A batteries are needed

- A 4
- B 8
- C 16
- D 20

28. The depth of discharge helps to determine the

- A Number of batteries to be connected in parallel
- B Number of batteries to be connected in series
- C The type of battery
- D The type of connections to make

29. The main function of a charge controller is

- A To protect the battery from overcharge and overdischarge
- B To protect the battery from excessive temperature
- C To protect the battery from moisture
- D To increase battery ventilation

30. The function of a battery is to

- A Help the solar panel absorb more sunlight
- B Provide a surge current
- C Supply A.C voltage to A.C appliances
- D To protect the charge controller

31. The function of a converter is to

- A Convert D.C to A.C
- B Convert A.C to D.C
- C Convert A.C to A.C
- D Convert D.C to D.C

32. If all D.C lamps in an installation do not illuminate, the reason could be due to

- A Burnt down of bulb
- B Damaged charge controller
- C Damaged switch
- D Damaged DC/AC Inverter

33. Self discharge of battery increases with increase in

- A Dust particles
- B Humidity
- C Temperature
- D Moisture

34. Primary batteries are not used in PV systems because

- A They have low efficiency
- B They are non-rechargeable
- C They are rechargeable
- D They are rare

35. Secondary batteries are used in PV systems because

- A They have high efficiency
- B They are non-rechargeable
- C They are rechargeable
- D They are available

36. Why are automobile batteries not suitable for PV systems?

- A They are designed to deliver high discharge currents for short periods
- B They are designed to deliver low discharge currents for short periods
- C They are designed to deliver high discharge currents for long periods
- D They are designed to deliver low discharge currents for long periods

37. The specific gravity of a battery is measured using

- A Anemometer
- B Pyranometer
- C Thermometer
- D Hydrometer

38. The voltage observed between positive and negative terminal when the system is not loaded is called

- A End point voltage
- B Open circuit voltage
- C Loaded voltage
- D Short circuit voltage

39. The minimum allowable voltage during discharging process of battery is called

- A End point voltage
- B Load voltage
- C Low voltage
- D High voltage

40. Electric shock is when

- A You complete the path of current flow through you
- B When you are manipulating high current
- C When you are manipulating low current
- D When there is no current in the system

41. The reason we have hard sulphation in Lead Acid battery is due to

- A Overcharged
- B Overdischarged
- C Charged up to 12.6V
- D Discharged up to 11V

42. Corrosion in lead-acid battery leads to

- A Decrease of the battery capacity
- B High temperature
- C Low temperature
- D Leakage of electrolyte

43. To maintain PV module output at zero volt during installation we

- A Cover the PV module surface with opaque materials
- B Cover the PV module surface with translucent materials
- C Cover the PV module surface with transparent materials
- D Expose the PV module to dust particles

44. Injury or death by electric shock is called

- A Short circuit
- B Over voltage
- C Electrocutation
- D Over current

45. Overloading a circuit causes

- A Short circuit
- B Over heating
- C Electrocutation
- D Over voltage

46. The ampere hour rating of a 360Wh, 12V system is

- A 4320Ah
- B 372Ah
- C 348Ah
- D 30Ah

The following loads were found in a dc installation: two 4W bulbs are ON for 5hours and one 60W TV is ON for 10 hours. If the system voltage is 24V, (question 47 to 49)

47. The total power of the system is

- A 64W
- B 56W
- C 68W
- D 240W

48. The total Wh of the system is

- A 640Wh
- B 960Wh
- C 600Wh
- D 800Wh

49. The total Ah of the system is

- A 40
- B 26.67
- C 5Ah
- D 33.33Ah

50. The value of air mass in standard test condition of PV modules is

- A AM1
- B AM1.5
- C AM2
- D AM0