

Roll No. ....

**3732**

**B. Tech. 8th Semester (Electrical Engg.)**

**Examination – May - 2026**

**Special Electrical Machines**

**Paper : PEC-EE-402-G**

**Time : Three hours ]**

**[ Maximum Marks : 75**

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) Comment on demagnetization in PMBLDC motor is called electronically commutate motor.
- (b) What is half Step motor ?
- (c) What is the function of drive circuit in stepper motor.
- (d) List out advantages of switched reluctance motor.

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P. T. O.

- (e) Mention the application of Reluctance motor.
- (f) List types of IM.

#### UNIT - I

2. (a) Describe construction of deep bar three phase IM.  
(b) Explain Slip ring IM.
3. (a) Explain production of rotating magnetic field in poly phase AC machine.  
(b) Explain concept of constant torque and constant power control.

#### UNIT - II

4. (a) Draw and explain characteristics of Universal motor.  
(b) Explain working principle of Reluctance motor.
5. (a) Explain two phase AC Servo Motor.  
(b) Explain working principle of single phase IM.

#### UNIT - III

6. Draw the cross sectional view of switched reluctance motor and explain the principle of operation. State the advantages.
7. (a) Explain in detail linear analysis of stepper motor.

- (b) Draw and explain drive circuits and their performance characteristics for a stepper Motor.

#### UNIT - IV

8. Derive an expression for permeance coeff of PMSM motor
9. Write Technical notes on :  
(a) PMSM motor  
(b) Synchronous motor

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**B. Tech. 8th Semester (Electrical Engg.)**

**Examination – May - 2026**

**Solar Thermal Applications**

**Paper : OEC-EE-402G/OEC-EE-406-G**

*Time : Three hours ]*

*[ Maximum Marks : 75*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note : Attempt five questions in all, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.*

1. (i) Define solar radiation.
- (ii) List instruments used to measure solar radiation.
- (iii) Define transmissivity of a collector cover system.
- (iv) Define collector efficiency factor.
- (v) What is sensible heat storage ?
- (vi) What is greenhouse effect ?

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#### SECTION - A

2. (a) Explain solar radiation outside and inside the earth's atmosphere.  
(b) Discuss instruments used for measuring solar radiation and sunshine.
3. Explain solar radiation geometry with suitable diagrams.

#### SECTION - B

4. (a) Explain construction and working of liquid flat plate collectors.  
(b) Derive the expression for collector heat removal factor.
5. (a) Discuss performance analysis of flat plate collectors.  
(b) Explain cylindrical parabolic collector with neat diagram.

#### SECTION - C

6. (a) Explain the concept and need of thermal energy storage.  
(b) Describe sensible heat storage system with examples.

7. (a) Compare sensible heat storage and latent heat storage.  
(b) Explain applications of thermal energy storage in solar systems.

#### SECTION - D

8. Explain *two* different types of solar air heaters.
  9. (a) Describe greenhouse effect and its applications.  
(b) Explain solar drying process.
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**B. Tech. 8th Semester (Electrical Engg.)**

**Examination – May, 2026**

**SOLAR ENERGY APPLIANCES**

**Paper : OEC-EE-408G/OEC-EE-418-G**

**Time : Three Hours ]**

**[ Maximum Marks : 75**

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

**1. (a)** List the applications of solar timber dryign.

**$2.5 \times 6 = 15$**

(b) List types of solar dryers.

(c) State the necessity of desalination.

(d) Define solar cell.

(e) State the basics of solar still.

(f) Distinguish between conventional and solar desalination.

3741- ~~500~~ (P-2)(Q-9)(26)

P. T. O.

### UNIT - I

2. (a) Describe solar home lighting system in detail. 7.5  
(b) Explain the working principle of solar cell in detail. 7.5
3. Discuss in detail the rural electrification process support your answer with few case studies. 15

### UNIT - II

4. What is a Solar Cooker ? Explain its working analysis with a neat sketch. 15
5. Analyse the performance evaluation of a Solar Cooker. 15

### UNIT - III

6. (a) Explain bin type solar dryer in detail. 7.5  
(b) Discuss forced circulation type dryers in detail. 7.5
7. (a) Discuss solar timber drying in detail. 7.5  
(b) Explain direct type solar dryer in detail. 7.5

### UNIT - IV

8. What is Solar desalination ? Explain its working and performance with a suitable sketch. 15
9. What are various desalination techniques ? Which method is best and why ? 15