



System Operator
Sample Generation Certification Examination

1. Real time transmission constraints or contingencies may be alleviated with generators operating
 - A. below 60 Hz.
 - B. on a new price curve.
 - C. on a new cost curve.
 - D. off cost (out of merit).

2. Monitoring LMP may give insights into
 - A. system constraints.
 - B. system voltage.
 - C. system frequency.
 - D. time error.

3. PJM calls for which of the following to recover the ACE so that tie line schedules are maintained?
 - A. instantaneous reserve check
 - B. 100% spinning
 - C. supplemental status report
 - D. minimum generation calculation

4. If not cancelled by PJM, the minimum generation alert expires
 - A. at the end of the specified light load period.
 - B. when notified by NERC.
 - C. 12 hours after the alert was issued.
 - D. after a 24hour period.

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5. When PJM declares a hot weather alert, the generation dispatcher should
1. determine if maintenance can be deferred.
 2. notify transmission operators.
 3. notify all generating stations and key personnel.
 4. direct all generating stations to reduce output.
- A. 1 and 2 only
B. 1 and 3 only
C. 2 and 4 only
D. 3 and 4 only
6. During system restoration, the two categories of reserves are
- A. dynamic and secondary.
B. spinning and quick start.
C. dynamic and spinning.
D. spinning and primary.
7. During system restoration, frequency should be maintained between
- A. 59.50 and 60.00 Hz.
B. 59.75 and 61.50 Hz.
C. 59.75 and 61.00 Hz.
D. 59.50 and 60.50 Hz.
8. PJM issues a heavy load voltage schedule. Member companies who own generation facilities should
- A. remove 230 kV capacitors from service.
B. ensure voltage regulators on generating units are in service on automatic.
C. inform transmission providers to have marketers in their areas cut transactions.
D. instruct generating stations to curtail nonessential building loads.
9. A unit being dispatched economically by PJM should set its MW output based on the
- A. LMP at generator bus.
B. LMP in the unit's zone.
C. Unit's dispatch rate or desired MW level.
D. generation owner's discretion.
10. A fossil steam unit is considered fuel limited when it is not capable of running at its maximum capacity for the next

- A. 16 hours.
 - B. 36 hours.
 - C. 72 hours.
 - D. 120 hours.
11. During system restoration prior to synchronization of a unit, the dispatcher should ensure sufficient load is available to
- A. economize unit operation.
 - B. maximize unit operation.
 - C. stabilize unit operation.
 - D. minimize unit operation.
12. A large unit in an external control area near PJM/PJM West trips. The PJM operator will see ACE
- A. decrease, frequency decrease.
 - B. remain the same, frequency decrease.
 - C. remain the same, frequency remain the same.
 - D. increase, frequency increase.
13. LMPs will change
- A. just prior to a change in the dispatch rate.
 - B. when PJM interchange changes.
 - C. when marginal generator output changes.
 - D. upon changes to regulation assignments.
14. The two control signals sent by the PJM EMS are
- A. ACE and Regulation.
 - B. ACE and frequency.
 - C. Regulation and Dispatch Rate/desired MW output.
 - D. Dispatch Rate and breaker control.
15. In real time, a combustion turbine scheduled by PJM in the day ahead market should
- A. check eDART to see when a unit should come on.
 - B. only start if requested by PJM.
 - C. follow their day ahead schedule exactly.
 - D. hedge its position with a decrement bid.
16. Which of the following oneway communication system is used to disseminate information to market operation centers?
- A. all call

- B. e-mail
 - C. radio
 - D. transaction management system
17. Real time bus prices may be monitored using
- A. eDATA.
 - B. eDART.
 - C. eSchedules.
 - D. eMKT.
18. Which of the following actions is a violation of PJM two settlement market rules?
- A. bidding a unit day ahead on a price-based schedule
 - B. not bidding demand (load) into the day ahead market
 - C. not bidding an available PJM capacity resource into the day ahead market
 - D. making the economic high limit and the emergency high limit the same
19. A unit that fails to start when scheduled, would be classified as which of the following types of outage?
- A. planned
 - B. maintenance
 - C. forced
 - D. self-scheduled
20. Maximum emergency generation is declared by PJM when which of the following occurs?
- A. sales to outside systems are greater than the largest contingency
 - B. neighboring control areas initiate a 5% voltage reduction
 - C. system frequency is below 59.98 Hz and ACE shows undergeneration
 - D. generation is required above the highest incremental economic system cost
21. Maintenance outages are permitted when
- A. a unit trips and is scheduled for a maintenance outage the following week.
 - B. a unit can be held online until the following Monday, and system reliability is not affected.
 - C. a unit has a capacity rating of 300 MWs or less.
 - D. manpower is onsite when a unit trips offline.
22. If PJM ACE shows overgeneration, actual imports are
- A. less than scheduled.
 - B. more than scheduled.
 - C. exactly as scheduled.

- D. on a flat tie line.
23. Which of the following reports will PJM request when a maximum emergency generation alert is issued?
- A. Instantaneous Reserve Check
 - B. Minimum Generation Report
 - C. Reactive Reserve Report
 - D. Supplementary Status Report
24. If a fossil steam unit has less than 32 hours of fuel at maximum capacity, it should be bid at
- A. price.
 - B. cost.
 - C. maximum emergency.
 - D. minimum emergency.
25. The loss of a large generation unit on the PJM system can be detected by monitoring
- A. frequency and PJM area control error.
 - B. frequency and load.
 - C. load and interchange.
 - D. system voltage and load.
26. During system restoration operations, a member company has a steam capacity of 600 MW, combustion turbine capacity of 200 MW, and 100 MW of hydro capacity. The load factors (governor response) are 5%, 25%, and 15% respectively. Also, 50 MW of load with underfrequency load shedding enabled has been restored. What is the total governor reserve capability of the company's steam, combustion turbine, and hydro units?
- A. 9.5 MW
 - B. 95 MW
 - C. 125 MW
 - D. 145 MW
27. A 1000 MW unit has tripped in the PJM control area and the PJM ACE now indicates undergeneration of 1050 MW. What immediate action should be taken by PJM to recover the ACE?
- A. Schedule all available regulation.
 - B. Request 100% spinning reserves be loaded.
 - C. Request a supplementary status report.

- D. Schedule additional generating units to parallel as soon as possible.
28. Which of the following emergency procedures are issued in advance of a scheduled load period to allow sufficient time for the generation dispatcher to prepare for the anticipated capacity shortages?
- A. warnings
 - B. actions
 - C. alerts
 - D. notifications
29. The amount of spinning reserve must be large enough to cover the loss of
- A. hydro units.
 - B. nuclear units online.
 - C. all generation online.
 - D. the largest single energy contingency.
30. When preparing a supplemental status report (SSR), a steam unit has 30 hours of fuel remaining. This unit should be reported as
- A. fossil/steam.
 - B. a resource limited unit.
 - C. maximum scheduled generation.
 - D. minimum generation.
31. PJM responds to capacity shortages by issuing alerts
- A. according to bid prices.
 - B. following completion of an instantaneous reserve check which indicates that the primary reserve is less than the spinning reserve requirement.
 - C. during present operations to inform members of actual capacity shortages or contingencies that may jeopardize reliable operation of the PJM control area.
 - D. in advance of a scheduled load period to allow sufficient time for members to prepare for anticipated initial capacity shortages.
32. During black start restoration, priority access to cranking power should be given to
- A. hot units that can return to service immediately.
 - B. combustion turbines in areas where the initial disturbance occurred.
 - C. units with black start capability.
 - D. hydro units.
33. Which of the following factors does NOT influence the load forecast?

- A. weather
 - B. temperature
 - C. day of the week
 - D. planned generation outages
34. Severe cold weather conditions require which of the following be staffed, started, and available for loading?
- A. hydro units
 - B. combustion turbines and diesels
 - C. nuclear units
 - D. wind generators
35. During system restoration, a generator should not be loaded above the level of available
- A. operating reserve.
 - B. spinning reserve.
 - C. primary reserve.
 - D. dynamic reserve.
36. The minimum passing score for a unit regulation test is
- A. 50% compliance with the test signal.
 - B. 75% compliance with the test signal.
 - C. 90% compliance with the test signal.
 - D. 100% compliance with the test signal.
37. PJM limits interchange to a
- A. total interchange of 500 MW.
 - B. change in total interchange of 1000 MW every 15 minutes.
 - C. **change in??** total net interchange of 1000 MW every 15 minutes.
 - D. total export of 1000 MW
38. Which of the following PJM esystems are used to report unit outages?
- A. eDART, eMKT, and eGADS
 - B. eMTR, eSchedules, and eMKT
 - C. eDART, eCapacity, and eGADS
 - D. eDART, eMKT, and eCapacity
39. Which of the following units is subject to cost capping?

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- A. a unit performing capacity verification test
 - B. a unit running for transmission congestion
 - C. a unit dispatched to provide spinning reserve
 - D. a unit running to control Eastern Transfer Limits
40. eDART is used for all of the following EXCEPT
- A. generation outage scheduling.
 - B. instantaneous reserve checks.
 - C. LMP information.
 - D. generator reactive capability changes.
41. Which of the following generating units would be eligible to set LMP?
- A. a self-scheduled (must run) steam unit
 - B. a unit dispatched for constraint control
 - C. a unit that is on for testing only
 - D. a hydro unit in condensing mode
42. A tie line with MW flowing into the PJM control area trips. The system operator will see which of the following occur?
- A. ACE will decrease, frequency will decrease
 - B. ACE will increase, frequency will increase
 - C. ACE will decrease, frequency will remain the same
 - D. ACE and frequency will remain the same
43. A Minimum Generation Emergency Alert is initiated when
- A. PJM projected LMP is at \$10/MW.
 - B. expected generation is within 2500 MW of normal minimum energy limits.
 - C. expected generation is within 2500 MW of emergency minimum levels.
 - D. expected generation is within 1000 MW of normal minimum energy limits.
44. The primary purpose of a Maximum Emergency Generation Alert is to
- A. allow member companies to inform management to be on site.
 - B. inform companies that PJM is within 1000 MW of normal minimum generation.
 - C. provide an early alert that system conditions may require PJM emergency procedures.
 - D. inform neighboring utilities that PJM has excess emergency reserves available.
45. A combustion turbine has 26 burn hours at maximum capacity. How should this be offered into the Energy Market?

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- A. maximum emergency
 - B. minimum emergency
 - C. black start
 - D. normally
46. Emergency reducible generation is defined as the difference between
- A. normal minimum and normal maximum generation.
 - B. maximum emergency generation and minimum emergency generation.
 - C. normal minimum generation and emergency minimum generation.
 - D. emergency minimum generation and normal maximum generation.
47. Operating reserve must equal the sum of
- A. spinning, quick start, and secondary.
 - B. quick start, secondary, and over thirty.
 - C. spinning, over thirty, and quick start.
 - D. secondary, over thirty, and spinning.
48. During system restoration, a company has a fossil steam capacity of 500 MW loaded to 300 MW of which 100 MW has a blocked governor, and combustion turbines of 200 MW loaded to 150 MW. The governor response factors are 5% for steam and 25% for combustion turbines. 30 MW of underfrequency load shedding relays are enabled. What is the total available dynamic reserve?
- A. 90 MW
 - B. 95 MW
 - C. 100 MW
 - D. 155 MW
49. The peak load forecast for an operating period in Mid-Atlantic Region is 40,000 MW. The peak load forecast for an operating period in Western/Southern Region is 50,000 MW. What is PJM's regulation requirement?
- A. 990 MW
 - B. 950 MW
 - C. 940 MW
 - D. 900 MW
50. When a market operation center's data link to PJM is down, the dispatcher must manually update the tele-failed data to PJM

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- A. continuously.
- B. every 30 minutes.
- C. every hour.
- D. every 8 hours.

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