Database Programming with PL/SQL
Semester 2 Final Review

Name: _____

1. A trigger executes immediately whenever the associated action occurs. (True or False)

2. Name the types of DML triggers (circle answers).

   a. Row
   b. Application
   c. User connection
   d. Statement

3. A database trigger executes whenever a data event, systems event, or application event occurs on the database. (True or False)

4. A good use of a trigger is to validate that a value is not null in a column. (True or False)

5. Which data dictionary contains the source code for a user's triggers?

   _____

6. Which of the following are NOT allowed within a database trigger (circle answers)?

   a. INSERT
   b. A call to a packaged procedure
   c. DROP
   d. A mouse click on a radio button
   e. COMMIT

7. DML triggers only fire once upon execution of a complete DML statement. (True or False)

8. A row trigger executes how many times?

   _____

9. A statement trigger executes once even if no rows are affected. (True or False)

10. The INSTEAD OF trigger is used mainly for what type of database object? _____

11. How many times will this trigger execute and when?

_____

```
CREATE OR REPLACE TRIGGER log_emp
  AFTER INSERT ON employees BEGIN
  INSERT INTO log_emp_table (who, when) VALUES (USER,
    SYSDATE);
END;
```

12. You want a trigger to fire when the SALARY column is updated in the EMPLOYEES table. Which of the following is the correct syntax for creating that DML trigger? _____

   a. CREATE OR REPLACE TRIGGER sal_upd_trigg AFTER
      UPDATE ON employees (salary)
         BEGIN
       … END;
   b. CREATE OR REPLACE TRIGGER sal_upd_trigg AFTER
      UPDATE OF salary ON employees BEGIN
         … END;
   c. CREATE OR REPLACE TRIGGER sal_upd_trigg BEFORE
      UPDATE OF salary ON employees BEGIN
         … END;

13. What is wrong with the following code?

_____

```
CREATE OR REPLACE TRIGGER mytrigg
  AFTER DELETE ON departments BEGIN
  INSERT INTO audit_table (who, when) VALUES
  (USER, SYSDATE); COMMIT;
END;
```

14. What is the clause to include when creating a row-level trigger? _____

15. If there are 4 employees in department 20, how many times will a row-level AFTER trigger fire when an UPDATE statement is executed? _____

16. A BEFORE statement trigger inserts a row into a logging table every time a user updates the salary column of the employees table. The user now tries to update the salaries of three employees with a single UPDATE statement, but the update fails because it violates a check constraint. How many rows will be inserted into the logging table? _____

17. The OLD and NEW qualifiers can be used with statement triggers as well as row triggers. (True or False)

18. INSTEAD OF triggers are only row-level triggers. (True or False)

19. Which of the following are DDL or database event triggers (circle answers)?

    a. A view is dropped
    b. A user deletes a row from the DEPARTMENTS table
    c. A user connects to the database
    d. A specific exception is raised in a user's session

20. What clause would be inserted into Line A to write a log record every time a new object is created in our schema? _____

    ```
    CREATE OR REPLACE TRIGGER log_create_trigg
    -- Line A -- BEGIN
      INSERT INTO log_table VALUES (USER,
    SYSDATE); END;
    ```

21. You can create a trigger that prevents DDL statements on an individual table, while still allowing DDL on other tables in the same schema. (True or False)

22. The DBA wants to keep track of server error ORA-00942. What clause is inserted into Line A in the following code? _____

    ```
    CREATE OR REPLACE TRIGGER servererror_trig AFTER
      SERVERERROR ON SCHEMA
    BEGIN
      -- Line A --
        INSERT INTO error_log_table ... END IF;
    END;
    ```

23. What is a mutating table? _____

    a. A table with more than one trigger
    b. A table that is being modified by a DML statement
    c. A table that is part of a view

24. What is the purpose of the CALL keyword in a trigger?

    _____

25. What is wrong with the following code? _____

    ```
    CREATE OR REPLACE TRIGGER emp_trig AFTER UPDATE
    OR DELETE ON employees BEGIN
      CALL del_emp_proc; END;
    ```

26. Why will this trigger fail? _____

```
CREATE OR REPLACE TRIGGER check_salary
  BEFORE INSERT OR UPDATE OF salary, job_id ON employees FOR EACH
  ROW
DECLARE
  v_minsalary  employees.salary%TYPE;  v_maxsalary
employees.salary%TYPE; BEGIN
  SELECT MIN(salary), MAX(salary) INTO
    v_minsalary, v_maxsalary FROM employees
    WHERE job_id = :NEW.job_id; IF
   :NEW.salary < v_minsalary OR
    :NEW.salary > v_maxsalary THEN RAISE_APPLICATION_ERROR(-
   20505,'Salary out of range'); END IF;
END;
```

   a. DECLARE is not a valid clause in a trigger definition.
   b. The trigger is SELECTing from the same table as the triggering DML statement is referencing.
   c. SELECT is invalid in a DML trigger.

27. Statements in the trigger body use the privileges of the trigger user, not the privileges of the owner executing the operation that fires the trigger. (True or False)

28. A user must be granted the CREATE TRIGGER system privilege to create a trigger in his/her schema. (True or False)

29. What privileges listed below will James need to create the following trigger (circle answers)?

```
CREATE OR REPLACE TRIGGER upd_tom_emp_trig AFTER
  UPDATE ON tom.employees
BEGIN
  INSERT INTO mary.log_table VALUES(USER,SYSDATE);
  sharon.calledproc; END;
```

   a. CREATE TRIGGER
   b. EXECUTE on sharon.calledproc
   c. ALTER on tom.employees
   d. INSERT INTO mary.log_table

30. What clause should be in Line A to see the trigger code for the RESTRICT_SALARY trigger?

```
SELECT trigger_name, trigger_type, triggering_event, table_name,
  status, trigger_body
  -- Line A --
  WHERE  trigger_name = 'RESTRICT_SALARY';
```

31. Which data dictionary view shows the compilation errors of a trigger?

   _____

32. Which statement will disable the triggers on the DEPARTMENTS table? _____

    a. ALTER TRIGGER ALL TRIGGERS ON departments DISABLE;
    b. ALTER TRIGGER DISABLE ALL TRIGGERS ON TABLE departments;
    c. ALTER TABLE departments DISABLE ALL TRIGGERS;

33. What command will recompile the EMP_TRIG trigger? _____

    a. COMPILE TRIGGER emp_trig;
    b. ALTER TRIGGER COMPILE emp_trig;
    c. ALTER TRIGGER emp_trig COMPILE;

34. All triggers on a table are removed when the table is removed. (True or False)

35. What happens when the user removes the EMPLOYEES table? _____

    CREATE OR REPLACE TRIGGER emp_trigg
     AFTER DELETE ON employees BEGIN
     ... END;

    a. An error message appears because you cannot remove a table that has a trigger.
    b. The table is dropped, and the trigger is disabled.
    c. The trigger and the table are dropped.

36. In which data dictionary view can you see the status of a schema object?

    _____

37. A procedure is said to be _____ when it is referenced by a table.

38. A single PL/SQL subprogram such as a procedure can be both a referenced object and a dependent object. (True or False)

39. If the table EMPLOYEES is updated to include a new column, what is the status of a procedure that contains a cursor based on the EMPLOYEES table? (Valid or Invalid)

40. The ADD_EMP procedure contains a SELECT statement using the EMP_VIEW, which is a subset of the EMPLOYEES table. What is the relationship of the ADD_EMP procedure to the EMPLOYEES table?

    _____

41. The following statement will show the dependencies and references for the listed objects. (True or False)

    SELECT name, type, referenced_name, referenced_typeFROM USER_DEPENDENCY WHERE referenced_name IN ('EMPLOYEES','EMP_VW');

42. Which of the following statements will show whether procedure ADD_EMP is valid or invalid? ____

   a. SELECT valid FROM USER_OBJECTS WHERE
      object_type = 'PROCEDURE' AND object_name =
      'ADD_EMP';
   b. SELECT status FROM USER_OBJECTS WHERE
      object_type = 'PROCEDURE' AND object_name =
      'ADD_EMP';
   c. SELECT status FROM USER_PROCEDURES WHERE
      procedure_name = 'ADD_EMP';
   d. SELECT * FROM deptree;

43. What does the following example PL/SQL code do? _____

   BEGIN deptree_fill('TABLE','ALICE','EMPLOYEES'); END;

   a. Displays the DEPTREE table showing the dependencies on EMPLOYEES in ALICE's schema.
   b. Fills the DEPTREE table showing the dependencies on EMPLOYEES in ALICE's schema.
   c. Inserts data into the DEPTREE_TEMPTAB showing the dependencies on EMPLOYEES in ALICE's
      schema.

44. What object do you use to see the dependencies after executing the DEPTREE_FILL procedure?

45. The IDEPTREE view shows dependencies by indenting the lines of output instead of by using a
    NESTED_LEVEL column. (True or False)

46. Which methods below minimizes dependency failure (circle answers)?

   a. Declaring records with the %ROWTYPE attribute
   b. Declaring variables with the %TYPE attribute
   c. Querying with the SELECT [column] notation
   d. Including a column list with INSERT statements

47. What four objects can you manually recompile?

   _____

48. Package DEPT_PKG contains two public procedures: GET_DEPT and UPD_DEPT. A separate procedure
    DEPT_RPT invokes DEPT_PKG.GET_DEPT. The UPD_DEPT package body code is now altered, and
    the package body (but not the package specification) is recreated. DEPT_RPT will be marked invalid and
    needs to be recompiled. (True or False)