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***** EXAMINATION *****

HYDRAULIC DESIGN OF RESERVOIR OUTLET WORKS

1. **The two broad classifications of reservoir outlet works facilities:**
 - a) are concrete gravity dam and embankment dam facilities
 - b) are earth dams and lift stations
 - c) are pumping stations and gravity dams
 - d) are lift stations and remote-site controlled dams

2. **Conduits for embankment dams may have:**
 - a) circular cross sections
 - b) horseshoe cross sections
 - c) rectangular cross sections
 - d) Any of the above

3. **Project functions and their overall effects include:**
 - a) environmental
 - b) overall social
 - c) economic
 - d) All of the above

4. **Flood control outlets are designed for:**
 - a) relatively large capacities
 - b) relatively small capacities
 - c) Either a or b
 - d) None of the above

5. **Irrigation discharge facilities are normally:**
 - a) much larger than flood regulation outlets
 - b) much smaller than flood regulation outlets
 - c) sized inversely proportionally to flood regulation outlets
 - d) sized directly proportionally to flood regulation outlets

6. **The municipal water supply intake requirements from a dam:**
 - a) will be determined by the state water resources engineer
 - b) will be determined by a licensed state water rights surveyor
 - c) will be determined by cooperating with the local engineers
 - d) None of the above

7. **Continuous low-flow releases are often required to satisfy:**
 - a) environmental objectives
 - b) water supply
 - c) downstream water rights
 - d) All of the above

8. **Foundation information of interest to the hydraulic designer:**
 - a) include composition and depth of overburden
 - b) include quality of underlying rock
 - c) include quality of exposed rock
 - d) All of the above

9. **The hydraulic grade line is also referred to as:**
 - a) the mean pressure gradient
 - b) the centerline profile
 - c) Selby's curve
 - d) None of the above

10. **The recommended equation for computing the resistance:**
 - a) coefficient is James - Manning
 - b) coefficient is Colebrook-White
 - c) coefficient is Alpire-Manning
 - d) coefficient is Forrest-Avery

11. **Resistance in concrete pipes differs from corrugated pipes:**
 - a) due to inclination of the pipes
 - b) due to the size of the corresponding pipes
 - c) due to corrugation heights and their angle to the flow
 - d) All of the above

12. **Normal velocity for unlined tunnels should not exceed:**
 - a) 5 fps and 20 fps for diversion flows
 - b) 10 fps and 25 fps for diversion flows
 - c) 10 fps and 15 fps for diversion flows
 - d) None of the above

13. **Energy losses due to conduit friction may be caused by:**
 - a) entrances
 - b) bends
 - c) gates
 - d) Any of the above

14. **Loss of head due to bends are a function of:**
 - a) the deflection angle of the bend
 - b) the conduit weight
 - c) the conduit density
 - d) the elevation of the bend

15. **Application of cavitation theory to practical design problems is:**
- a) empirical
 - b) risky
 - c) difficult
 - d) None of the above
16. **Sluices for concrete dams are generally located along the:**
- a) outside edge of the flow of the spillway monolith
 - b) centerline of the spillway monolith
 - c) outside edge of the flow of the spillway monolith
 - d) Any of the above
17. **The sluices for concrete gravity dams usually have cross-sectional:**
- a) area that is relatively small
 - b) area that is relatively large
 - c) area directly proportional to the concrete gravity area
 - d) area inversely proportional to the concrete gravity area
18. **Trash racks are provided for:**
- a) garbage caught in the turbines
 - b) protection of turbines from debris
 - c) downstream garbage
 - d) All of the above
19. **The type of intake structures include:**
- a) gated tower
 - b) multilevel
 - c) uncontrolled two-way riser
 - d) Any of the above
20. **For all flow conditions, the recommended gate lip geometry is:**
- a) 15 degrees
 - b) 30 degrees
 - c) 45 degrees
 - d) 60 degrees

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