

DEPARTMENT OF IRRIGATION

Dated: November 22, 2016

Thapar University, Patiala conducted the test for recruitment to vacant posts of **SDE (Mechanical)** in the department of **DEPARTMENT OF IRRIGATION**, on **November 12, 2016**. The answer key for the paper was uploaded on **November 14, 2016** and the objections pertaining to any of the keys were invited upto **November 16, 2016**. Based upon the objections received, answer key was revised on **November 19, 2016**. After the feedback of the Candidates and the experts of the specific area, final answer key has been prepared. Following questions have been reviewed again.

NAME OF POST: SDE (M)

I QUERIES FOUND VALID IN THE REVISED ANSWER KEY AND QUESTION CANCELLED

Match List-I with List-II and select the correct answer using the code given below the lists:

List-I

- a. Centrifugal pump
 - b. Gear pump
 - c. Reciprocating pump
 - d. Turbine pump
- A) a-4, b-2, c-1, d-3
C) a-4, b-2, c-3, d-1

List-II

- 1. Air vessel
 - 2. Draft tube
 - 3. Guide vanes
 - 4. Rotor having blades
- B) a-3, b-4, c-1, d-2
D) a-2, b-4, c-3, d-1

Explanation: Due to minor mistake in the question, one of the option from list I, does not match the answer in the list II *i.e.* Turbine pump, D). Turbine pumps are submersible pumps which do not use draft tubes rather than they use vertical tubes to lift the water from deep wells. **Therefore, no option matches the answer. Henceforth this question has been CANCELLED.**

II QUERIES FOUND VALID IN THE REVISED ANSWER KEY AND THE CHANGES IN THE REVISED ANSWER KEY

High specific speed (300 to 1000) and the low heads (below 30m) indicates that the turbine is a _____.

- A) Pelton turbine B) Francis turbine
C) Kaplan turbine D) Propeller turbine

Explanation: The specific speed and head for Pelton wheel is 10-25 (head above 250 m) and, Francis; 50 to 300 (head, 60-250 m) and for Kaplan 300 to 1000 (Head up to 30m).

The difference between Kaplan and the Propeller turbine is only that the Kaplan has adjustable runner blades and propeller has fixed blades. Rest their operating specific speed and head are same.

Therefore, both the options C) and D are correct.

For a point in a strained body, carrying two unequal unlike principal stresses P_1 and P_2 ($P_1 > P_2$), the maximum shear stress is given by _____.

A) $P_1/2$

B) $P_2/2$

C) $(P_1 - P_2)/2$

D) $(P_1 + P_2)/2$

Explanation: Maximum shear stress for two unequal principal stresses is given by,

$$\tau_{\max} = \frac{P_1 - P_2}{2}.$$

Two unlike principal stresses are given, so $P_1 = P_1$ and $P_2 = -P_2$

$$\text{Therefore, } \tau_{\max} = \frac{P_1 - (-P_2)}{2} = \frac{P_1 + P_2}{2}$$

Thus, the answer should be D) instead of C).

III QUERIES IN THE REVISED ANSWER KEY FOR QUESTION NUMBERS 29, 38, 41 AND 85 ARE FOUND INVALID AND THE REVISED ANSWER KEY AS UPLOADED WAS FOUND TO BE CORRECT.