

DEPARTMENT OF IRRIGATION

Dated: November 19, 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**.

After due consultation with the experts of the specific area, some of the objections were found valid and its modified key is provided below.

Candidates, who raised the objections, will receive the solution of the question through their registered Email.

The question for which the original key was found valid are also provided alongside.

NAME OF POST: SDE (M)

I QUERIES FOUND VALID AND QUESTION CANCELLED

A laminar boundary layer occurs at flat plate at zero incidence to the flow. If the thickness of the boundary layer at a section of 2 m from the leading edge is 2 mm, then the thickness of the boundary layer at a section 4 mm from the leading edge will be_____.

A) $2 \times (2)^2$ mm

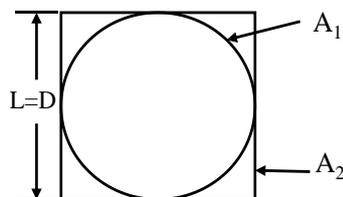
B) $2 \times (2)^{1/2}$ mm

C) $2 \times (2)^{4/5}$ mm

D) $2 \times (2)^{1/5}$ mm

Explanation: Due to misprint of the units in the question, *i.e.* '4 mm', which actually should have been '4 m', no option matches the answer. **So none of the options provided in all four choices is correct; henceforth this question has been CANCELLED.**

What will be the view factor, F_{12} , for the geometrical shape shown below (Sphere with in a cube)?



A) $\pi/2$

B) $\pi/4$

C) $\pi/3$

D) $\pi/6$

Explanation: Due to minor mistake in the question, F_{21} has been wrongly printed as F_{12} . Therefore, no option matches the answer. Henceforth this question has been CANCELLED.

II QUERIES FOUND VALID AND THE CHANGES IN THE KEY OF THE QUESTION PAPER

The fluid property that remains unchanged across a normal shock wave is_____.

- A) stagnation enthalpy
- B) stagnation pressure
- C) static pressure
- D) mass density

Explanation: It is stagnation enthalpy which remains constant across the normal shock and not stagnation pressure. Thus, the correct answer is 'A' instead of 'B'.

Operating characteristic curves of a turbine means that the curves are drawn at constant _____.

- A) head
- B) discharge
- C) speed
- D) efficiency

Explanation: The operating characteristic curves of a turbine are drawn at constant speed. Therefore, option 'C' is the most appropriate option. It was wrongly marked originally as option 'A'. Thus, the correct answer is 'C' instead of 'A'.

The coal rank is classified as per its_____.

- A) specific gravity
- B) degree of metamorphism
- C) carbon percentage
- D) ash contents

Explanation: Generally, the degree of alteration (or metamorphism) that occurs as a coal matures from peat to anthracite is referred to as the "rank" of the coal. It was wrongly marked originally as option 'D'. Thus, the correct answer is 'B' instead of 'D'.

Match **List-I (type of coal)** with **List-II (coal properties)** and select the correct answer using the code given below the lists:

List-I

- a. Lignite
- b. Anthracite
- c. Bituminous
- d. Coke

List-II

- 1. Artificial fuel derived from the coal
- 2. Contains inflammable gas and burns with flame
- 3. Very hard and high heating value
- 4. High ash contents and less volatile matter

- A) a-2, b-3, c-4, d-1
C) a-2, b-1, c-4, d-3

- B) a-4, b-1, c-2, d-3
D) a-4, b-3, c-2, d-1

Explanation: Lignite contains high ash contents and less volatile matter, Anthracite is very hard and of high heating value, Bituminous contains inflammable gas and burns with flame and Coke is artificial fuel derived from the coal. **It was wrongly marked originally as option 'A'. Thus, the correct answer is 'D' instead of 'A'.**

Which one of the following power plants gives the least running cost for generation of electric power?

- A) Hydroelectric power plant
C) Nuclear power plant
- B) Steam turbine power plant
D) Gas turbine power plant

Explanation: The hydro power plant gives least running cost of generation of electric power, because of nil fuel consumption. The answer was inadvertently wrongly marked in the original. **It was wrongly marked originally as option 'C'. Thus, the correct answer is 'A' instead of 'C'.**

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) $P_1/2$
C) $(P_1 - P_2)/2$
- B) $P_2/2$
D) $(P_1 + P_2)/2$

Explanation: Considering that the principal stresses are unequal and unlike, the maximum shear stress should be $(P_1 - P_2)/2$. **It was wrongly marked originally as option 'D'. Thus, the correct answer is 'C' instead of 'D'.**

Which one of the following operations is carried out at the minimum cutting velocity, if the machines are equally rigid and the tool work materials are the same?

- A) Turning
C) Boring
- B) Grinding
D) Milling

Explanation: Grinding is the operation carried out at the minimum cutting velocity. **It was wrongly marked originally as option 'D'. Thus, the correct answer is 'B' instead of 'D'.**

The tolerances in case of lost wax or precision casting is_____.

A) $\pm 0.001\text{mm}$

B) $\pm 0.005\text{mm}$

C) $\pm 0.05\text{mm}$

D) $\pm 0.01\text{mm}$

Explanation: The tolerance is $\pm 0.05\text{mm}$. It was wrongly marked originally as option 'B'. Thus, the correct answer is 'C' instead of 'B'.

III QUERIES FOR QUESTION NUMBERS 3, 9, 12, 16, 19, 24, 26, 29, 30, 31, 34, 37, 40, 45, 49, 53, 54, 70, 71, 72, 77, 78, 84, 86, 87, 98, 103, 104, 108, 130, 132, 135 AND 142 ARE FOUND INVALID AND THE ANSWER KEY AS UPLOADED WAS FOUND TO BE CORRECT.